MECHANICAL ABBREVIATION LIST

ABBREVIATION	DESCRIPTION
A	COMPRESSED AIR
A(___#)	COMPRESSED AIR (SPECIFIC PSIG)
AAV	AUTOMATIC AIR VENT
ACC	AIR COOLED CONDENSER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR
AD	AREA DRAIN
AE	AIR EXTRACTOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
AMP	AMPERE
APD	AIR PRESSURE DROP
AR	ARGON
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS
ASR	AUTOMATIC SPRINKLER RISER
AUX	AUXILIARY
AV	ACID VENT
AVTR	ACID VENT THROUGH ROOF
AW	ACID WASTE
BAS	BUILDING AUTOMATION SYSTEM
BCU	BLOWER COIL UNIT
BDD	BACKDRAFT DAMPER
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BVC	BEVERAGE CONDUIT
BWV	BACKWATER VALVE
C	COMMON
CAP	CAPACITY
CAV	CONSTANT AIR VOLUME
CB	CATCH BASIN
CC	COOLING COIL
CD	COLD DECK
CD	CONDENSATE DRAIN
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHW	CHILLED WATER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CLG	COOLING
CNDS	CONDENSATE
CNDS (___#)	CONDENSATE (SPECIFIC PSIG)
CO	CLEAN OUT
CO2	CARBON DIOXIDE
CONT	CONTINUATION OR CONTINUED
CONTR	CONTRACTOR
CONV	CONVECTOR
COP	COEFFICIENT OF PERFORMANCE
CP	CIRCULATING PUMP
CRU	CONDENSATE RETURN UNIT
CSS	CLINICAL SERVICE SINK
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
CW	DOMESTIC COLD WATER
CWF	DOMESTIC COLD WATER - FILTERED
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D&T	DRIP AND TRAP
DA	DISCHARGE AIR
DAT	DISCHARGE AIR TEMPERATURE
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREE
DFU	DRAINAGE FIXTURE UNITS
DIA	DIAMETER
DMPR	DAMPER
D/N	DAY/NIGHT
DN	DOWN
DNZ	DOWNSPOUT NOZZLE
DS	DUCT SILENCER
DT	DRAIN TILE
DTC	DRAIN TILE CONNECTION
DWH	DOMESTIC WATER HEATER
DWG	DRAWING
(E)	EXISTING
E	EXHAUST GRILLE OR REGISTER
EA	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	EXPANSION COMPENSATOR
ECUH	ELECTRIC CABINET UNIT HEATER
EDB	ENTERING DRY BULB
EER	ENERGY EFFICIENCY RATIO
EES	EMERGENCY EYE WASH / SHOWER
EEW	EMERGENCY EYE WASH
EF	EXHAUST FAN
EFF	EFFICIENCY
EHC	ELECTRIC HEATING COIL
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
EMS	ENERGY MANAGEMENT SYSTEM
ERL	ENERGY RECOVERY LOOP
ERLR	ENERGY RECOVERY LOOP RETURN
ERLS	ENERGY RECOVERY LOOP SUPPLY
ERU	ENERGY RECOVERY UNIT
ESH	EMERGENCY SHOWER
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRIC UNIT HEATER
EWB	ENTERING WET BULB
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
F	FIRE PROTECTION
°F	DEGREES FAHRENHEIT
F&B	FACE AND BYPASS
F&T	FLOAT AND THERMOSTATIC
FA	FACE AREA
FCU	FAN COIL UNIT

ABBREVIATION	DESCRIPTION
FD	FLOOR DRAIN
FFD	FUNNEL FLOOR DRAIN
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FHV	FIRE HOSE VALVE
FLA	FULL LOAD AMPS
FLR	FLOOR
FM	FLOW METER
FMS	FLOW MEASURING STATION
FPM	FEET PER MINUTE
FP	FIRE PUMP
FPTU	FAN POWERED (AIR) TERMINAL UNIT
FS	FLOOR SINK
FSEC	FOOD SERVICE EQUIPMENT CONTRACTOR
FT	FEET
FTR	FINNED TUBE RADIATION
FV	FACE VELOCITY
G	NATURAL GAS
GA	GAUGE
GAL	GALLON
GRH	GRAVITY RELIEF HOOD
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GSAN	GREASE SANITARY WASTE
H	HYDROGEN
HB	HOSE BIBB
HC	HEATING COIL
HD	HOT DECK
HEPA	HIGH EFFICIENCY PARTICULATE ARRESTANCE
HL	HIGH LIMIT
HOA	HAND/OFF/AUTO
HP	HEAT PUMP
HP	HORSEPOWER
HPCW	HIGH PRESSURE DOMESTIC COLD WATER
HPHW	HIGH PRESSURE DOMESTIC HOT WATER
HPHWR	HIGH PRESSURE DOMESTIC HOT WATER RETURN
HPL	HEAT PUMP LOOP
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
HW(___)	DOMESTIC HOT WATER (SPECIFIC TEMP °F)
HWR	DOMESTIC HOT WATER RETURN
HX	HEAT EXCHANGER
HZ	HERTZ
IAQ	INDOOR AIR QUALITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IH	INTAKE HOOD
IN	INCHES
IR	INFRARED HEATER
IW	INDIRECT WASTE
JC	JANITOR'S CLOSET
JP	JOCKEY PUMP
KW	KILOWATT
KWH	KILOWATT-HOUR
LAT	LEAVING AIR TEMPERATURE
LAB	LABORATORY
LAV	LAVATORY
LBS	POUNDS
LDB	LEAVING DRY BULB
LL	LOW LIMIT
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
LRA	LOCKED ROTOR AMPS
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MCA	MEDICAL COMPRESSED AIR
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	MANHOLE
MIL	1/1000th INCH
MIN	MINIMUM
MISC	MISCELLANEOUS
MMBH	MILLION BRITISH THERMAL UNITS PER HOUR
M/S	MOTOR STARTER
MTD	MOUNTED
MTR	MOTOR
MV	MANUAL AIR VENT
MVAC	MEDICAL VACUUM
N	NITROGEN
N2O	NITROUS OXIDE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NCTC	NORMALLY CLOSED TIMED CLOSED
NCTO	NORMALLY CLOSED TIMED OPEN
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NOTC	NORMALLY OPEN TIMED CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPCW	NON POTABLE COLD WATER
O	OXYGEN
OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
OB	OUTLET BOX
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER/CENTER TO CENTER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OL	OVERLOAD
ORC	OVERFLOW RAIN CONDUCTOR
ORD	OVERFLOW ROOF DRAIN
OS&Y	OUTSIDE SCREW AND YOKE
OV	OUTLET VELOCITY
OWS	OPERATOR WORKSTATION

ABBREVIATION	DESCRIPTION
PACU	PACKAGED AIR CONDITIONING UNIT
PBD	PARALLEL BLADE DAMPER
PC	PUMPED CONDENSATE
PCW	PROCESS COOLING WATER
PCWR	PROCESS COOLING WATER RETURN
PCWS	PROCESS COOLING WATER SUPPLY
PD	PRESSURE DROP (FEET OF WATER)
PH	PERIMETER HEAT
PHR	PERIMETER HEAT RETURN
PHS	PERIMETER HEAT SUPPLY
PNL	PANEL
PPM	PARTS PER MILLION
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSAN	PUMPED SANITARY
PST	PUMPED STORM
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAUGE
PW	PURIFIED WATER
PWR	PURIFIED WATER RETURN
PWS	PURIFIED WATER SUPPLY
(R)	RELOCATED
R	RETURN GRILLE OR REGISTER
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RC	RAIN CONDUCTOR
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
REQD	REQUIRED
REF	ROOF EXHAUST FAN
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RLFA	RELIEF AIR
RPM	REVOLUTIONS PER MINUTE
RPDA	REDUCED PRESSURE BACKFLOW PREVENTION DETECTION ASSY
RPZA	REDUCED PRESSURE BACKFLOW PREVENTION ZONE ASSY
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
S	SUPPLY AIR DIFFUSER OR GRILLE
SA	SOUND ATTENUATOR
SA	SUPPLY AIR
SAN	SANITARY WASTE
SAT	SUPPLY AIR TEMPERATURE
SECT	SECTION
SF	SUPPLY FAN
SH	SHOWER
SK	SINK
SMR	SNOW MELT RETURN
SMS	SNOW MELT SUPPLY
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SPKLR	SPRINKLER
SQFT	SQUARE FOOT/SQUARE FEET
S/S	START/STOP
SS	SERVICE SINK
ST	STORM
STD	STANDARD
STK	STACK
STM	STEAM
STM(___#)	STEAM (SPECIFIC PSIG)
S/W	SUMMER/WINTER
SW	SWITCH
T	TRANSFER GRILLE
TC	TEMPERATURE CONTROL
TC	TEMPERING COIL
TCP	TEMPERATURE CONTROL PANEL
TD	TRENCH DRAIN
TEMP	TEMPERATURE
TEMP	TEMPORARY
TH	TERMINAL HEATING
THA	TOTAL HEAT ABSORBED
THR	TERMINAL HEATING RETURN
THR	TOTAL HEAT REJECTED
THS	TERMINAL HEATING SUPPLY
TSP	TOTAL STATIC PRESSURE
TU	(AIR) TERMINAL UNIT
TV	TURNING VANES
TYP	TYPICAL
UH	UNIT HEATER
UL	UNDERWRITER'S LABORATORY
UON	UNLESS OTHERWISE NOTED
UR	URINAL
UV	UNIT VENTILATOR
V	VALVE
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VD	VOLUME DAMPER (MANUALLY ADJUSTABLE)
VOL	VOLUME
VFC	VARIABLE FREQUENCY CONTROLLER
VTR	VENT THROUGH ROOF
VTU	VENTURI TERMINAL UNIT
VUV	VERTICAL UNIT VENTILATOR
W	WASTE
W&V	WASTE AND VENT
WAGD	WASTE ANESTHETIC GAS DISPOSAL
WB	WET BULB
WC	WATER CLOSET
WC	WATER COLUMN
WG	WATER GAUGE
WH	WALL HYDRANT
WMSD	WASHING MACHINE SUPPLY AND DRAIN BOX
WPD	WATER PRESSURE DROP
WT	WEIGHT
XFMR	TRANSFORMER

TEMPERATURE CONTROL - PARTIAL SYMBOLS LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
CO2	CARBON DIOXIDE SENSOR	OS	OCCUPANCY SENSOR
CO	CARBON MONOXIDE SENSOR	PT	PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSMITTER	SP	STATIC PRESSURE SENSOR OR PROBE
FM	FLOW METER		VALVE - 2 WAY CONTROL VALVE
	GUARD FOR STAT OR SENSOR		VALVE - 3 WAY CONTROL VALVE
H	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)	T	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

PIPING SYMBOLS

SYMBOL	DESCRIPTION
AV	AIR VENT - AUTOMATIC
MV	AIR VENT - MANUAL
BFP	BACKFLOW PREVENTER
	CATCH BASIN
	CIRCULATING PUMP
CO	CLEAN OUT - IN FLOOR
CO	CLEAN OUT - FLANGE
	DIRECTION OF FLOW
	DIRECTION OF PITCH - DOWN
	FINNED TUBE RADIATION
	FIRE PROTECTION - SIAMESE CONNECTION - FREE STANDING
	FIRE PROTECTION - SIAMESE CONNECTION - WALL MOUNTED
	FIRE PROTECTION - SPRINKLER HEAD, CONCEALED
	FIRE PROTECTION - SPRINKLER HEAD, PENDANT
	FIRE PROTECTION - SPRINKLER HEAD, UPRIGHT
	FIRE PROTECTION - SPRINKLER HEAD, SIDEWALL
	FLOOR DRAIN
	FLOOR DRAIN - ELEVATION
	FLOOR DRAIN - FUNNEL
	FLOOR DRAIN - FUNNEL, ELEVATION
	FLOW MEASURING DEVICE (FOR TEST AND BALANCING)
FS	FLOW SWITCH
FM	FLOW METER
HB	HOSE BIBB
MH	MANHOLE
	OPEN SITE DRAIN
	PIPE - ANCHOR
	PIPE - CAP OR PLUG
	PIPE - ELBOW DOWN
	PIPE - ELBOW UP
	PIPE - EXPANSION JOINT OR COMPENSATOR
	PIPE - FLANGE
	PIPE - HOSE AND BRAID FLEXIBLE CONNECTION
	PIPE - RUBBER FLEXIBLE CONNECTION
	PIPE - GUIDE
	PIPE - TEE DOWN
	PIPE - TEE UP
	PIPE - UNION
P/T	PRESSURE AND TEMPERATURE TEST PLUG
	PRESSURE GAUGE AND COCK
	REDUCER - CONCENTRIC
	REDUCER - ECCENTRIC
	ROOF/OVERFLOW DRAIN
	STEAM TRAP - FLOAT AND THERMOSTATIC
	STEAM TRAP - BUCKET
	STRAINER
	STRAINER WITH VALVE AND BLOW-OFF
	THERMOMETER
	TRAP
	VALVE - ANGLE
	VALVE - BALL
	VALVE - BUTTERFLY
0.5	VALVE - BALANCE (i.e. BALANCE VALVE TO 0.5 GPM)
0.5	VALVE - COMBINATION BALANCE & FLOW MEASURING (i.e. BALANCE VALVE TO 0.5 GPM)
	VALVE - CHECK
	VALVE - SPRING CHECK
	VALVE - GAS (MANUAL)
	VALVE - GLOBE
	VALVE - ISOLATION
	VALVE - NEEDLE
	VALVE - OS&Y
	VALVE - PLUG
	VALVE - PRESSURE REGULATING
	VALVE - PRESSURE REDUCING
	VALVE - PRESSURE RELIEF
	VALVE - PRESSURE & TEMPERATURE RELIEF
VTR	VENT THROUGH ROOF
WH	WALL HYDRANT

DOUBLE LINE PIPING SYMBOLS

SYMBOL	DESCRIPTION
	FLANGE
	FLEX CONNECTION
	STRAINER - BASKET
	STRAINER - Y TYPE
	VALVE - 2 WAY CONTROL
	VALVE - 3 WAY CONTROL
	VALVE - BUTTERFLY
	VALVE - CHECK
	VALVE - DETECTOR CHECK
	VALVE - OS&Y HORIZONTAL STEM
	VALVE - OS&Y VERTICAL STEM

DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
TU-101	AIR TERMINAL UNIT
TU-101	AIR TERMINAL UNIT WITH HEATING COIL
TU-101	VENTURI AIR TERMINAL UNIT
VTU-101	VENTURI AIR TERMINAL UNIT WITH HEATING COIL
	DAMPER - HORIZONTAL FIRE (EXISTING, NEW)
	DAMPER - HORIZONTAL FIRE / SMOKE (EXISTING, NEW)
	DAMPER - SMOKE (EXISTING, NEW)
	DAMPER - VERTICAL FIRE (EXISTING, NEW)
	DAMPER - VERTICAL FIRE / SMOKE (EXISTING, NEW)
BDD	DAMPER - BACK DRAFT
M	DAMPER - MOTORIZED
	DAMPER - VOLUME (MANUALLY ADJUSTABLE)
	DIFFUSER - BLANK OFF
	DIFFUSER - LINEAR SLOT
	DIFFUSER - SQUARE OR RECTANGULAR
	DUCT CROSS SECTION - SUPPLY
	DUCT CROSS SECTION - RETURN
	DUCT CROSS SECTION - EXHAUST
	DUCT - FLEXIBLE CONNECTION
	DUCT - FLEXIBLE DUCT
	DUCT TAKE-OFF - ROUND CONICAL
	DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	ELBOW - RECTANGULAR WITH TURNING VANES
	ELBOW - RECTANGULAR SHORT RADIUS WITH SPLITTER VANES
	ELBOW - ROUND
	ELBOW - RECTANGULAR SMOOTH RADIUS
	ELBOW DOWN - RECTANGULAR
	ELBOW DOWN - ROUND
	ELBOW UP - RECTANGULAR
	ELBOW UP - ROUND
	HEATING COIL
D	INCLINED DROP IN DIRECTION OF AIRFLOW
R	INCLINED RISE IN DIRECTION OF AIRFLOW
	TRANSITION - CONCENTRIC
	TRANSITION - ECCENTRIC
	FAN - AXIAL
	FAN - CENTRIFUGAL (ELEVATION)
	HEATING COIL
D	INCLINED DROP IN DIRECTION OF AIRFLOW
R	INCLINED RISE IN DIRECTION OF AIRFLOW
	ELBOW DOWN - RECTANGULAR
	ELBOW DOWN - ROUND
	ELBOW UP - RECTANGULAR
	ELBOW UP - ROUND
	TRANSITION - CONCENTRIC
	TRANSITION - ECCENTRIC
	TRANSITION - ECCENTRIC
	UNIT HEATER - HORIZONTAL THROW
	UNIT HEATER - VERTICAL THROW
	REGISTER - RETURN OR EXHAUST
	REGISTER - RETURN WITH BOOT
	REGISTER - TRANSFER GRILLE
	ROOF EXHAUST FAN
	INTAKE OR RELIEF HOOD

DOUBLE LINE DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
	DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	DUCT TAKE-OFF - ROUND CONICAL
	ELBOW - RECTANGULAR WITH TURNING VANES
	ELBOW - RECTANGULAR SHORT RADIUS WITH SPLITTER VANES
	ELBOW - ROUND
	ELBOW - RECTANGULAR SMOOTH RADIUS

MECHANICAL DRAWING INDEX

STANDARD METHODS OF NOTATION

S-1 10ø 350-4	SUPPLY DIFFUSER WITH SCHEDULE TAG "1", 10" DIAMETER NECK SIZE 350 CFM TYPICAL FOR 4
R-1 22x22 640-2	RETURN REGISTER WITH SCHEDULE TAG "1", 22"x 22" NECK SIZE 640 CFM TYPICAL FOR 2 EXHAUST REGISTER E DESIGNATION SIMILAR.
TU-101	AIR TERMINAL UNIT WITH HEATING COIL NO. 101 WITH SERVICE CLEARANCE SHOWN
VTU-101	VENTURI AIR TERMINAL WITH HEATING COIL NO. 101 WITH SERVICE CLEARANCE SHOWN
8	PIPE DIAMETER NOTATION ALL SIZES IN INCHES
8ø 22x10 18x14ø	DUCT SIZE NOTATION ALL SIZES IN INCHES OVAL DUCT RECTANGULAR DUCT
1	CONSTRUCTION KEY NOTE (NUMBER) OR DEMOLITION KEY NOTE (LETTER)
EF 1	EQUIPMENT DESIGNATION, (i.e. EXHAUST FAN NUMBER 1)
HW-1	PIPING RISER DESIGNATION (i.e. HOT WATER RISER NUMBER 1)
	NEW SYSTEM COMPONENT EXISTING SYSTEM COMPONENT TO REMAIN POINT OF NEW CONNECTION SYMBOL
1 M5.1	SECTION OR PLAN NUMBER SHEET WHERE SECTION IS DRAWN
	AREA OF ENLARGEMENT PLAN NUMBER SHEET WHERE ENLARGED PLAN IS DRAWN
1 M5.1	SECTION OR PLAN NUMBER **SECTION OR ENLARGED PLAN** **SCALE: 1/8" - 1' - 0"** SHEET WHERE SECTION IS CUT OR ENLARGED PLAN IS REFERENCED
SHEET M1.0 SHEET M1.1	MATCH LINE
	HEAVY LINE WEIGHT INDICATES NEW WORK
	LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT OR REFERENCED INFORMATION
	GRAY LINE INDICATES BACKGROUND INFORMATION
	DASHED LINES INDICATE PIPING ROUTED BELOW SLAB OR GRADE
	HATCH MARKS INDICATE EQUIPMENT OR MATERIALS TO BE DISCONNECTED AND REMOVED.

NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

MECHANICAL STANDARDS AND DRAWING INDEX

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	SVM
CHECKED	SVM
APPROVED	RNR

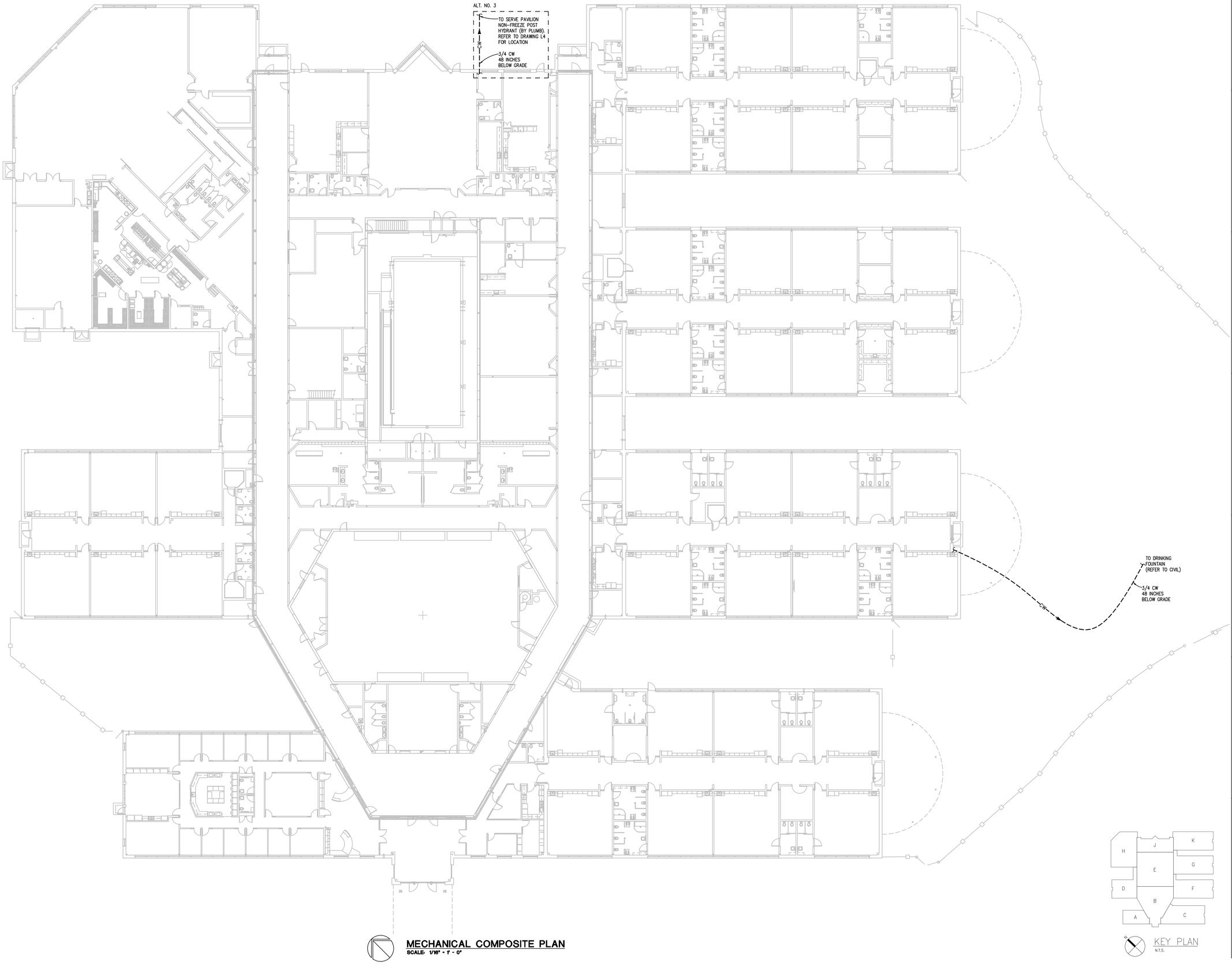
PROJECT NO.

19040

DRAWING NO.

M0.1-BP3

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



MECHANICAL COMPOSITE PLAN
SCALE: 1/16" = 1' - 0"

KEY PLAN
N.T.S.

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DRAWING TITLE

MECHANICAL COMPOSITE PLAN

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05-27-2020	FOR CONSTRUCTION – BID PACK #3
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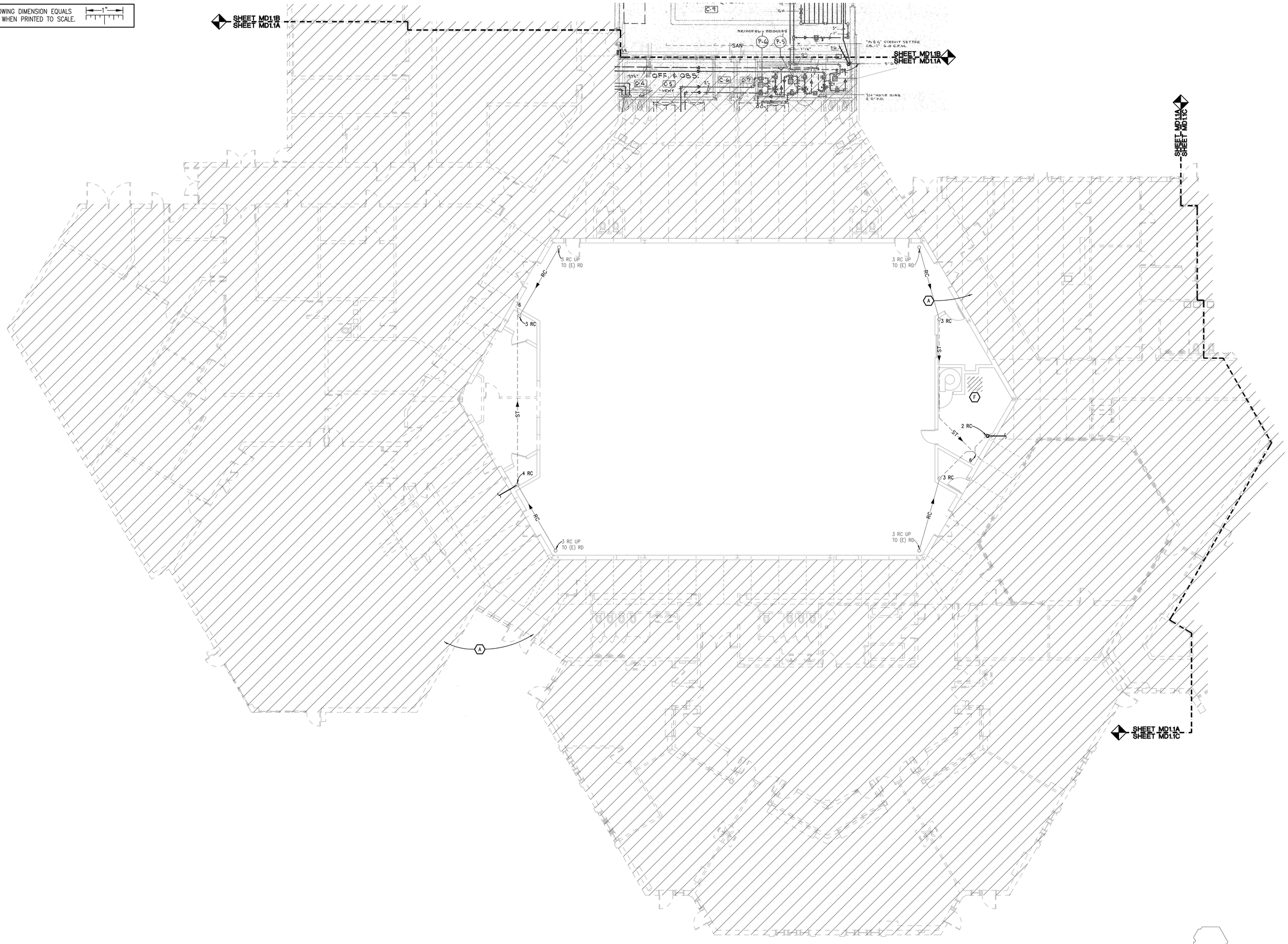
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN SVM
CHECKED SVM
APPROVED RNR

PROJECT NO.
19040

DRAWING NO.
M0.2-BP3

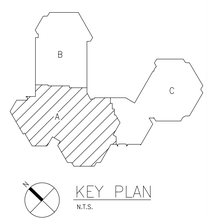
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



PLUMBING DEMOLITION PLAN - ZONE A

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

REFER TO SHEET MD2.1B FOR NOTES



KEY PLAN
N.T.S.

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PLUMBING DEMOLITION PLAN - ZONE A

ISSUE DATES

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12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

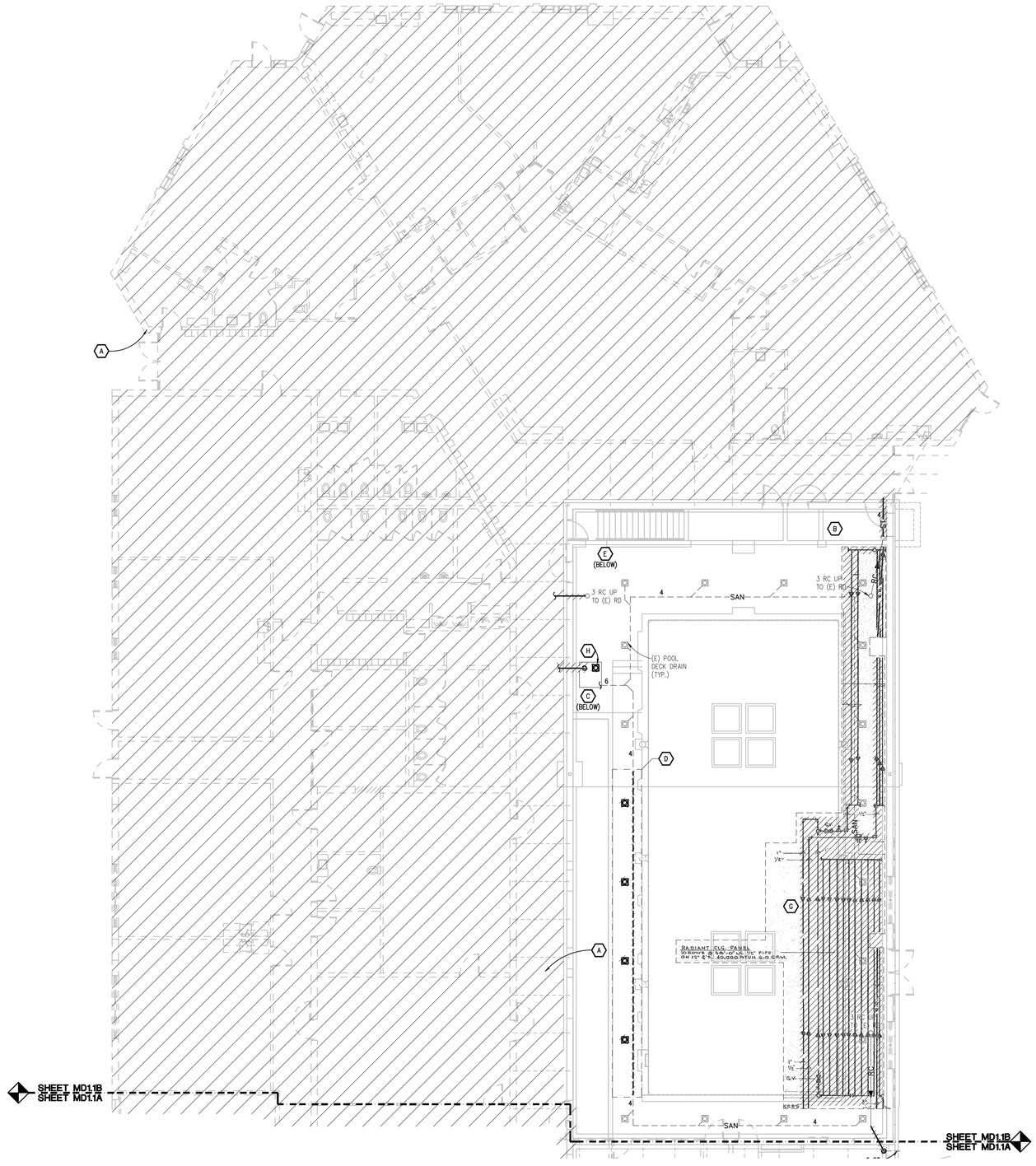
PROJECT NO.

19040

DRAWING NO.

MD2.1A-BP3

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



PLUMBING DEMOLITION PLAN - ZONE B

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

MECHANICAL GENERAL DEMOLITION NOTES:

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(#) DEMOLITION KEY NOTES:

A. BUILDING BEING DEMOLISHED (FOR REFERENCE ONLY). DEMOLITION SCOPE PREVIOUSLY ISSUED IN BP1.

B. EXISTING POOL BOILER, POOL WATER PIPING, AND PUMP SHALL REMAIN. REMOVE EXISTING GAS PIPING ASSOCIATED WITH BOILER.

C. EXISTING SUMP PUMP TO REMAIN. DISCONNECT PUMPED ST DISCHARGE PIPING AND REMOVE COMPLETE. PREPARE EXISTING PUMPS FOR RECONNECTION TO NEW SANITARY SYSTEM.

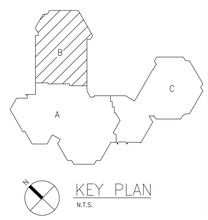
D. REMOVE EXISTING 4 SAN IN POOL PIPING TUNNEL (BELOW POOL DECK) AND ASSOCIATED POOL DECK DRAINS TO ALLOW INSTALLATION OF NEW POOL RAMP. PREPARE REMAINING POOL DECK DRAIN PIPING FOR RECONNECTION.

E. PREPARE TO RECONNECT POOL DRAIN PIPING TO NEW SANITARY SYSTEM.

F. REMOVE ABANDONED VACUUM SYSTEM/TANK COMPLETE.

G. REMOVE RADIANT CEILING AND PIPING COMPLETE.

H. REMOVE DRAIN IN BOTTOM OF SUMP AND CAP EXISTING STORM DRAIN. PATCH FLOOR OF SUMP TO MATCH EXISTING FINISH AND ELEVATION. ABANDON EXISTING STORM DRAIN IN PLACE.



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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

PLUMBING DEMOLITION PLAN - ZONE B

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.

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DRAWING NO.

MD2.1B-BP3

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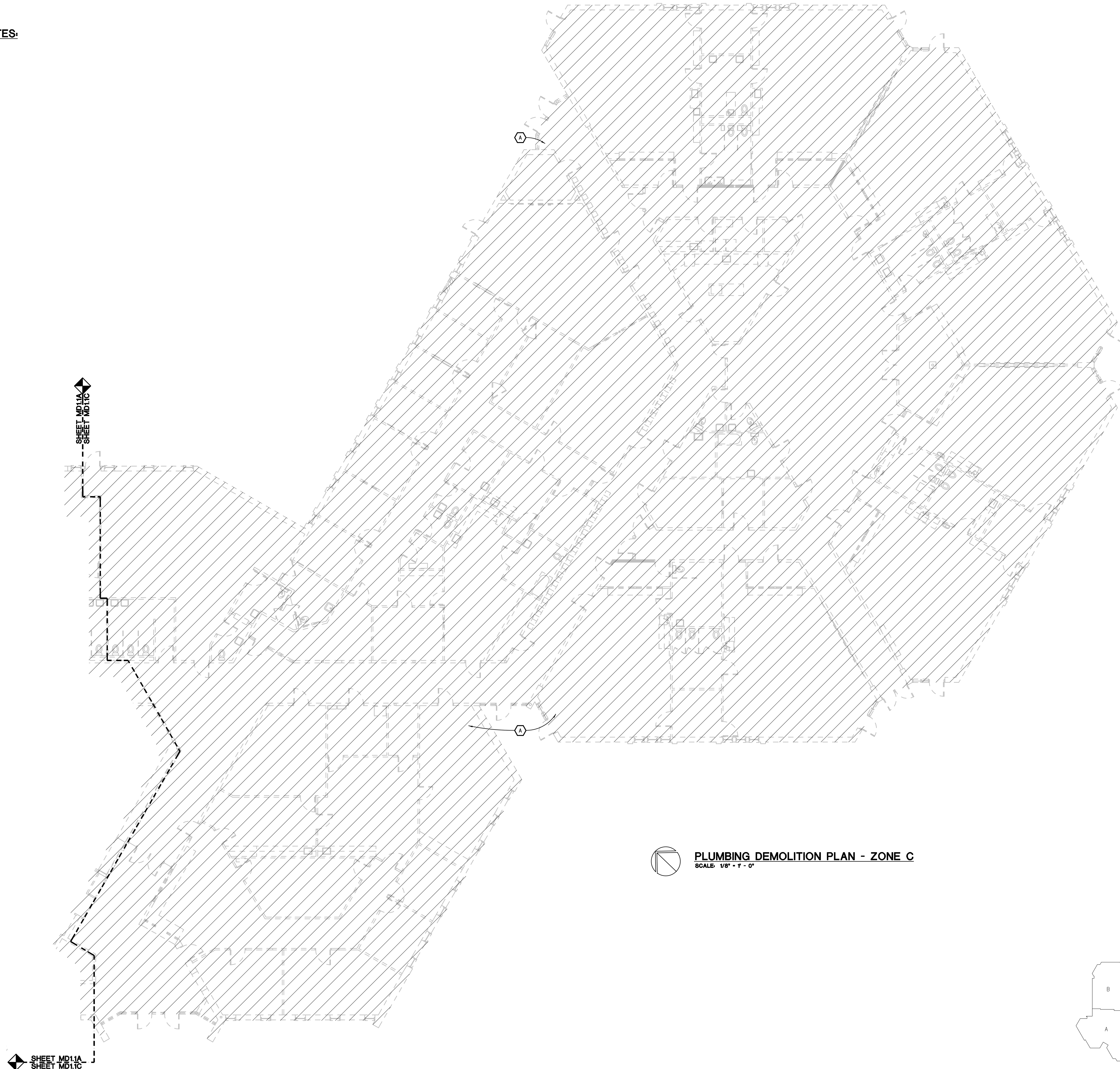
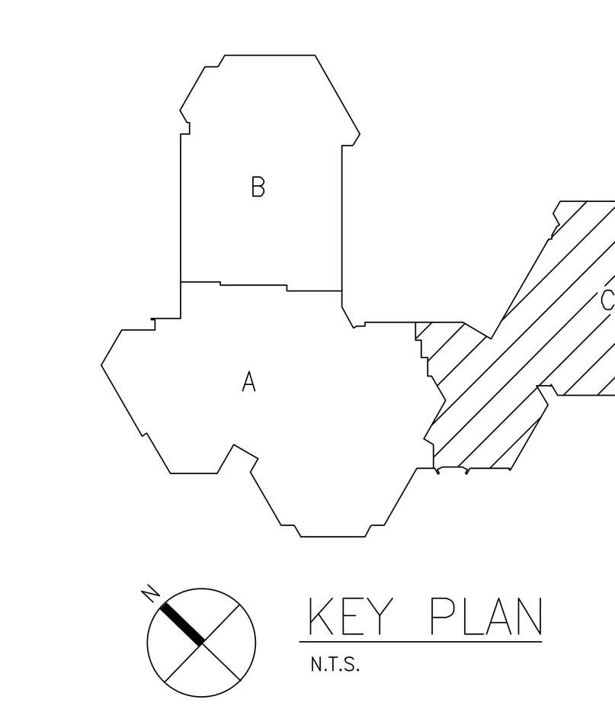


PLUMBING DEMOLITION PLAN - ZONE C
SCALE: 1/8" = 1' - 0"



KEY PLAN
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PROJECT TITLE
New High Point School Washtenaw Intermediate School District
1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE
PLUMBING DEMOLITION PLAN - ZONE C

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DRAWING NO.
MD2.1C-BP3

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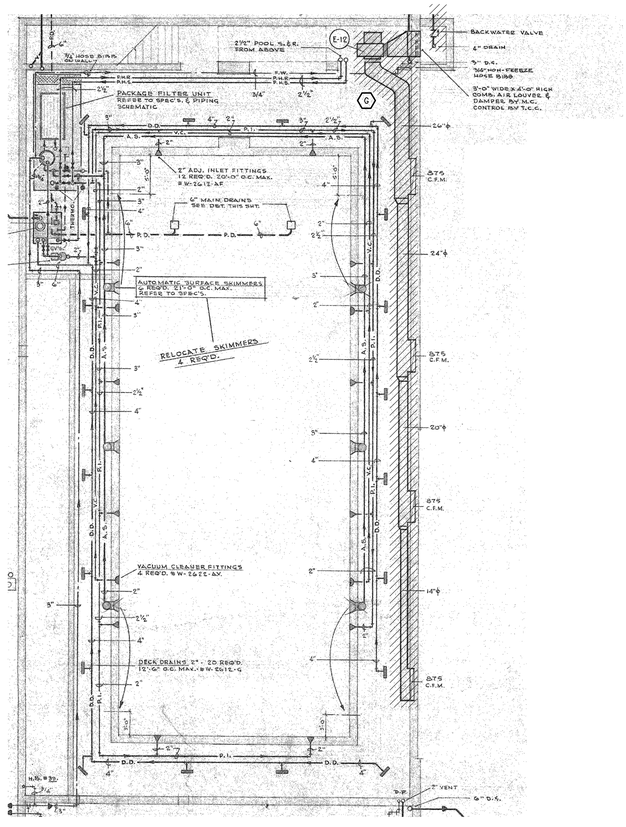

LOWER LEVEL MECHANICAL DEMOLITION PLAN - ZONE C

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

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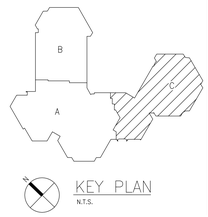
C. REMOVE EXISTING DUCTWORK COMPLETE.

D. REMOVE EXISTING DUCTWORK AND TERMINAL UNIT COMPLETE.

E. REMOVE EXISTING RELIEF HOOD AND DUCTWORK COMPLETE. CAP CURB PER DETAIL.

F. REMOVE EXISTING LOUVER/GRILLE AND SLEEVE COMPLETE. COORDINATE PATCHING OF WALL WITH ARCHITECTURAL TRADES.

G. REMOVE EXISTING POOL EXHAUST FAN AND DUCTWORK COMPLETE.



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LOWER LEVEL MECHANICAL DEMOLITION PLAN - ZONE C

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SHEET MD3.1B
SHEET MD3.1A

SHEET MD3.1B
SHEET MD3.1A

SHEET MD3.1A
SHEET MD3.1C

SHEET MD3.1A
SHEET MD3.1C

GYMNASIUM
B-22

STO.
B-21A

STORE
B-21

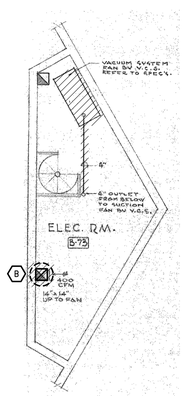
STO.
B-21B

OFFICE
B-23

STAIR
B-22

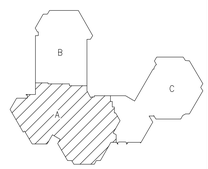
GYM STO.
B-24

(E) DUCTWORK TO REMAIN



GYM MEZZANINE HVAC DEMOLITION PLAN
SCALE: 1/8" = 1' - 0"

MECHANICAL DEMOLITION PLAN - ZONE A
SCALE: 1/8" = 1' - 0"
REFER TO SHEET MD1.1B FOR NOTES



KEY PLAN
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MECHANICAL DEMOLITION PLAN - ZONE A

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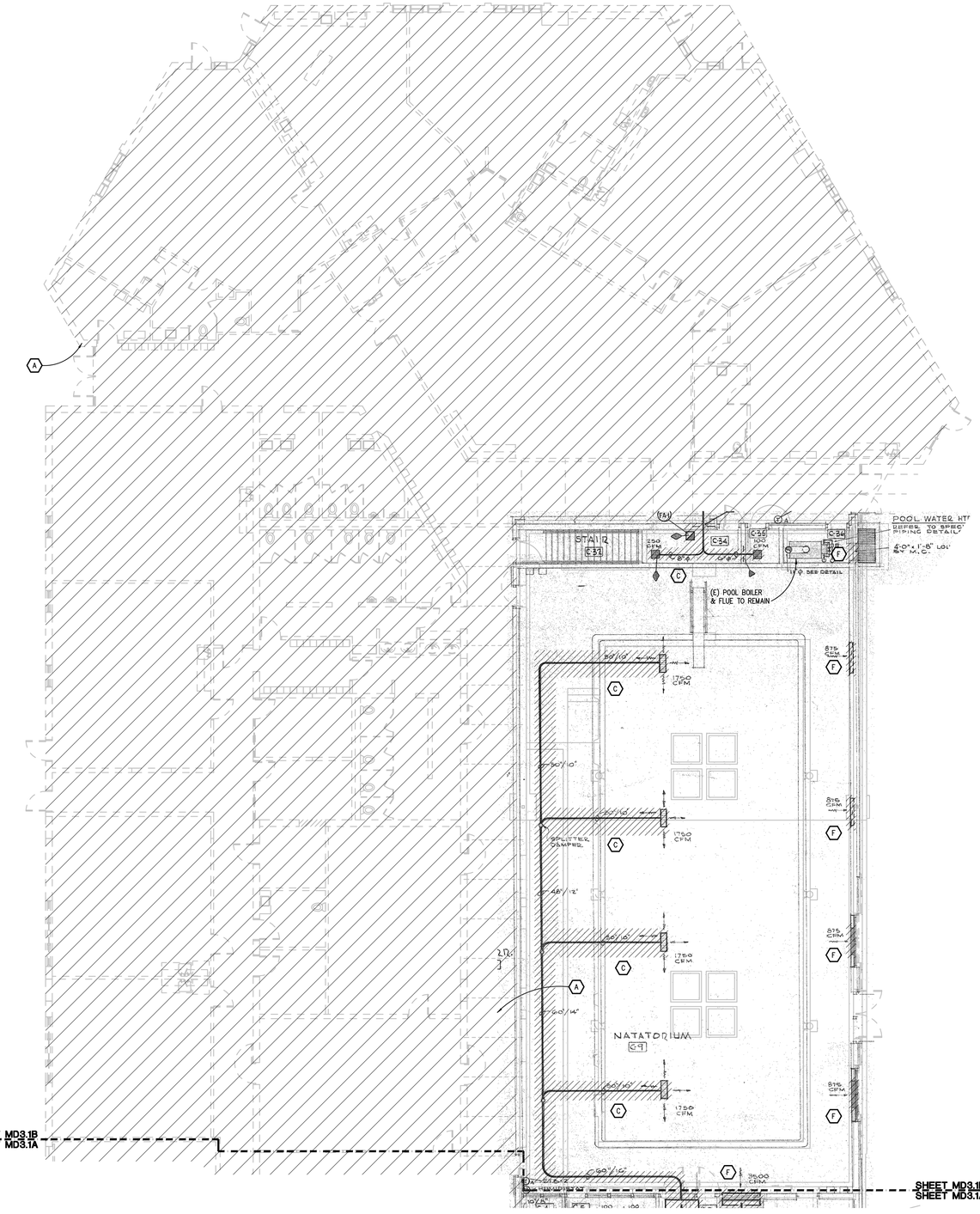

MECHANICAL DEMOLITION PLAN - ZONE B

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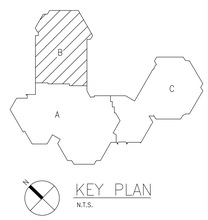

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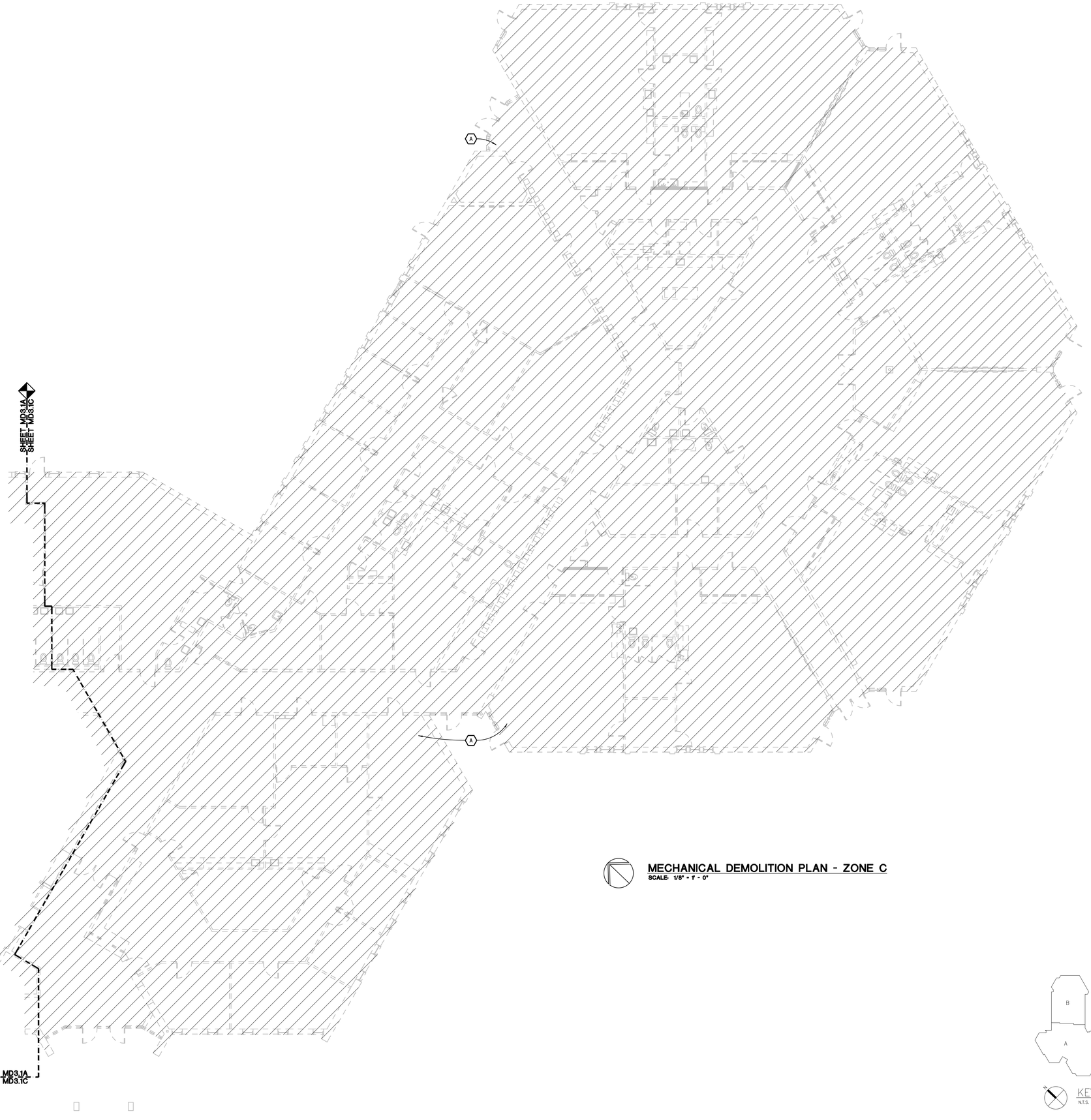
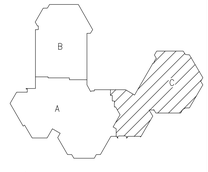


MECHANICAL DEMOLITION PLAN - ZONE C
SCALE: 1/8" = 1' - 0"



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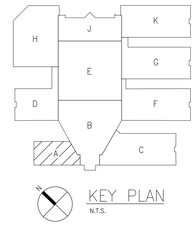
FIRE PROTECTION PLAN - ZONE A
SCALE: 1/8" = 1' - 0"

FIRE PROTECTION GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. NO SPRINKLER PIPING SHALL BE ROUTED THROUGH ELECTRICAL EQUIPMENT ROOMS, TELECOMMUNICATION EQUIPMENT ROOMS, ELEVATOR EQUIPMENT ROOMS OR SIMILAR ROOMS. ONLY SPRINKLER PIPING SERVING SPRINKLERS HEADS IN THOSE ROOMS SHALL BE ALLOWED.
4. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
5. MINIMUM RUN-OUT PIPE SIZE TO SPRINKLER HEADS SHALL BE 1".
6. PROVIDE AN AUTOMATIC WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13 LIGHT HAZARD CLASSIFICATION. HYDRAULIC CALCULATIONS SHALL BE BASED ON DENSITY OF 0.10 GPM/SQ FT. OVER THE MOST REMOTE 1500 SQ. FT.
7. ACCORDING TO THE MOST RECENT FLOW TEST INFORMATION, THE STATIC PRESSURE AVAILABLE AT THE CITY WATER MAIN AT THE STREET IS 55 PSIG. RESIDUAL PRESSURE WITH 865 GPM FLOWING IS 16 PSIG. CONTRACTOR SHALL MAKE HIS OWN PRESSURE AND FLOW TEST PRIOR TO SYSTEM DESIGN.
8. FIRE PROTECTION WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

(#) CONSTRUCTION KEY NOTES:

1. PROVIDE FIRE SUPPRESSION COVERAGE FROM DRY PIPE SYSTEM.
2. PROVIDE DRY PIPE SYSTEM BRANCH TO SERVE NOTED AREAS.
3. PROVIDE INSPECTORS TEST STATION PER DETAIL.
4. PROVIDE GALVANIZED PIPE AND POLYESTER FINISHED SPRINKLER HEADS IN NATATORIUM AND NATATORIUM EQUIPMENT ROOM BELOW POOL DECK.
5. SERVED BY FIRE PROTECTION (ZONE 1).
6. SERVED BY FIRE PROTECTION (ZONE 2).
7. SERVED BY FIRE PROTECTION (ZONE 3).
8. PROVIDE SPRINKLER HEADS ABOVE AND BELOW CEILING IN AREAS INDICATED. COORDINATE EXACT AREAS WITH ARCHITECTURAL REFLECTED CEILING PLANS.



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Mitchell and Mouat architects

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5145 Livernois, Suite 100
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Tel: 248-879-5666
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www.PeterBassoAssociates.com
PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

FIRE PROTECTION PLAN - ZONE A

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN KRD
CHECKED SVM
APPROVED RNR

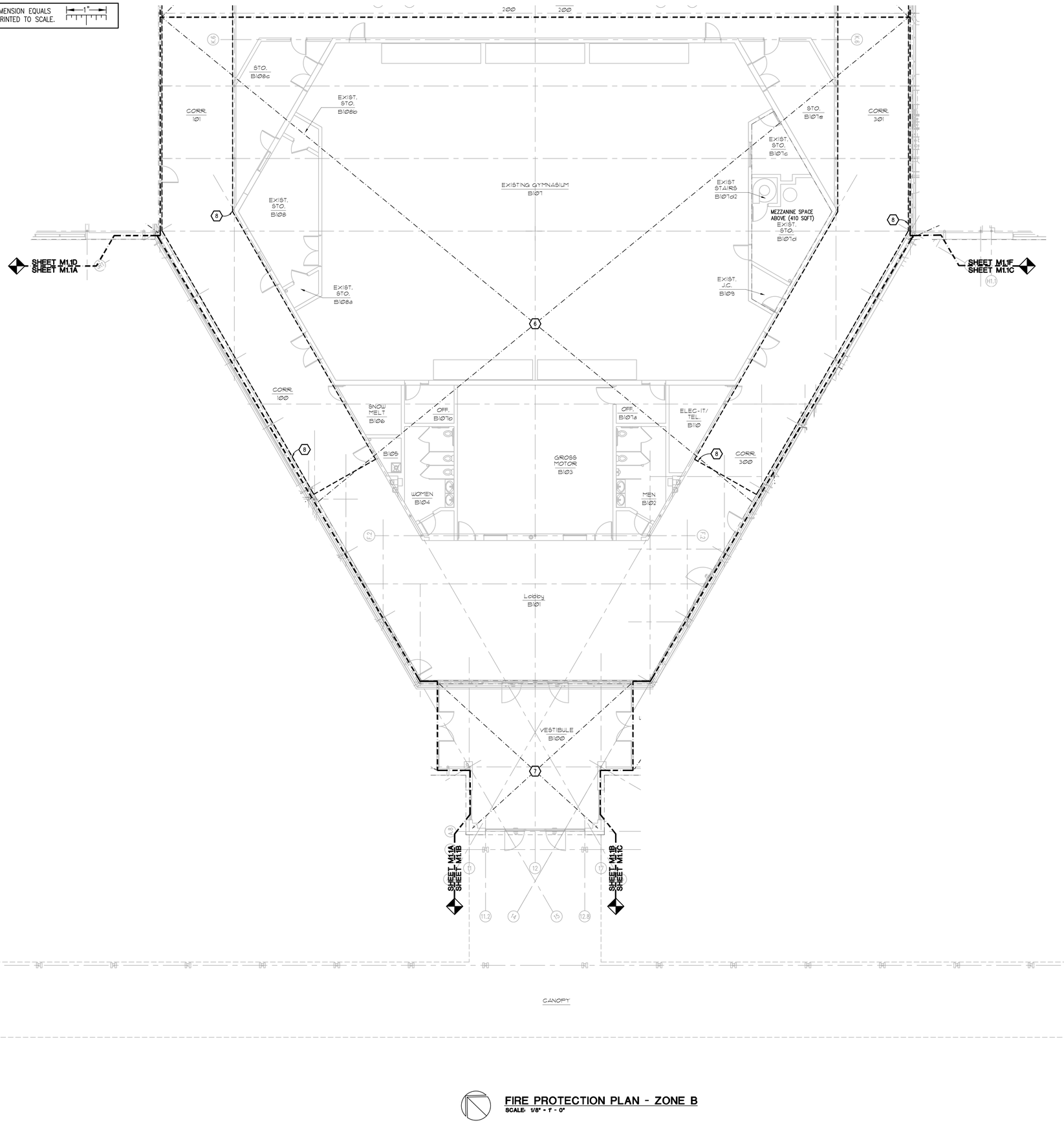
PROJECT NO.

19040

DRAWING NO.

M1.1A-BP3

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



FIRE PROTECTION PLAN - ZONE B
SCALE: 1/8" = 1' - 0"

FIRE PROTECTION GENERAL NOTES:

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3. NO SPRINKLER PIPING SHALL BE ROUTED THROUGH ELECTRICAL EQUIPMENT ROOMS, TELECOMMUNICATION EQUIPMENT ROOMS, ELEVATOR EQUIPMENT ROOMS OR SIMILAR ROOMS. ONLY SPRINKLER PIPING SERVING SPRINKLERS HEADS IN THOSE ROOMS SHALL BE ALLOWED.
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8. FIRE PROTECTION WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

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5. SERVED BY FIRE PROTECTION (ZONE 1).
6. SERVED BY FIRE PROTECTION (ZONE 2).
7. SERVED BY FIRE PROTECTION (ZONE 3).
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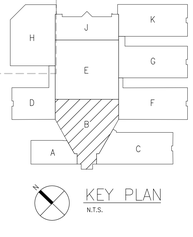

KEY PLAN
N.T.S.

TMP ARCHITECTURE
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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
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DRAWING TITLE

FIRE PROTECTION PLAN - ZONE B

ISSUE DATES

DATE:	ISSUED FOR:
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05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

PROJECT NO.

19040

DRAWING NO.

M1.1B-BP3

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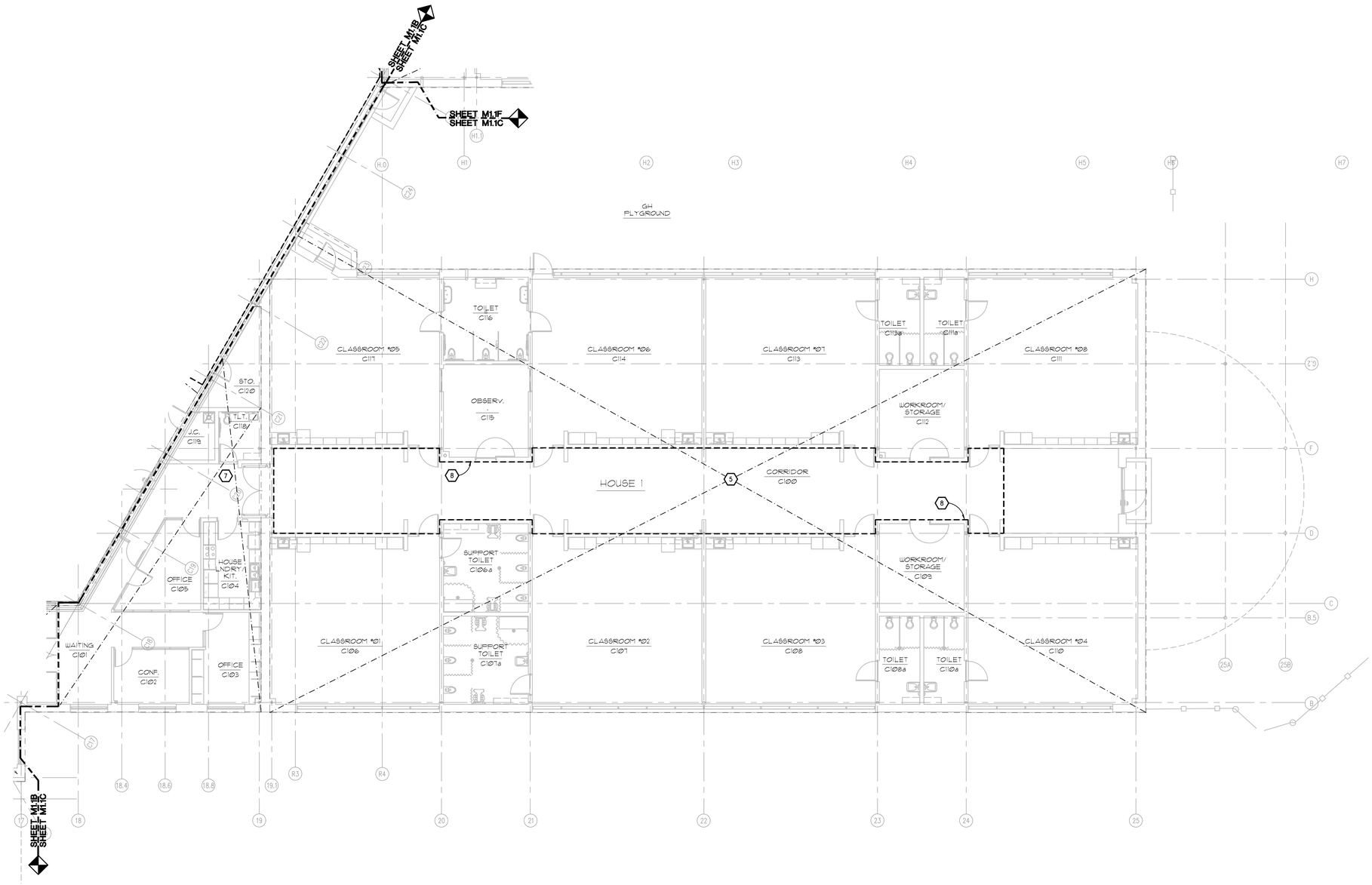

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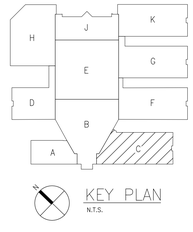
FIRE PROTECTION PLAN - ZONE C

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



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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

FIRE PROTECTION PLAN - ZONE C

ISSUE DATES

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DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

PROJECT NO.

19040

DRAWING NO.

M1.1C-BP3

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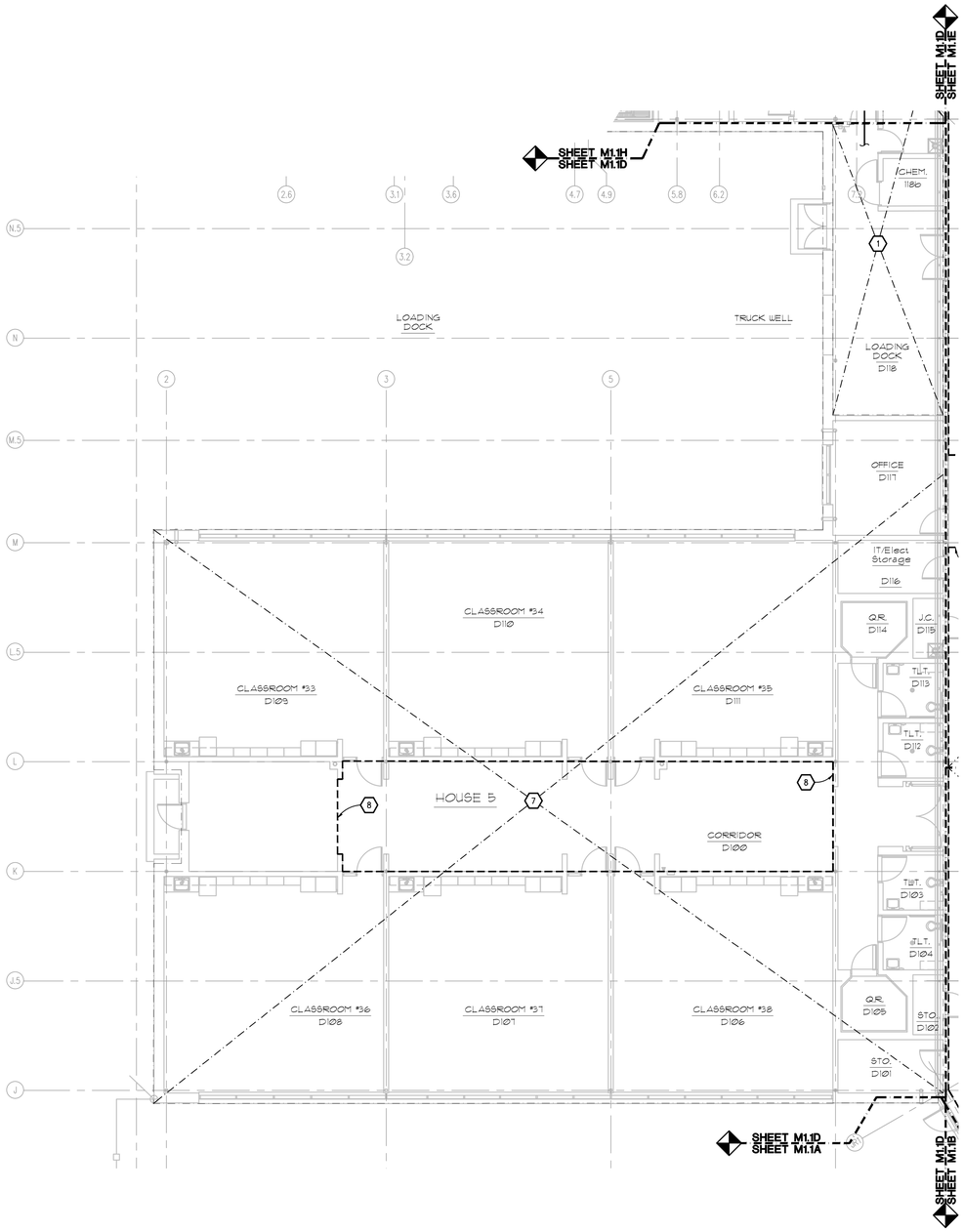

FIRE PROTECTION PLAN - ZONE D

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

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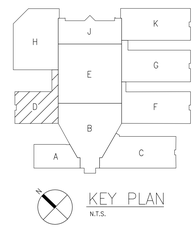

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

FIRE PROTECTION PLAN - ZONE D

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

PROJECT NO.

19040

DRAWING NO.

M1.1D-BP3

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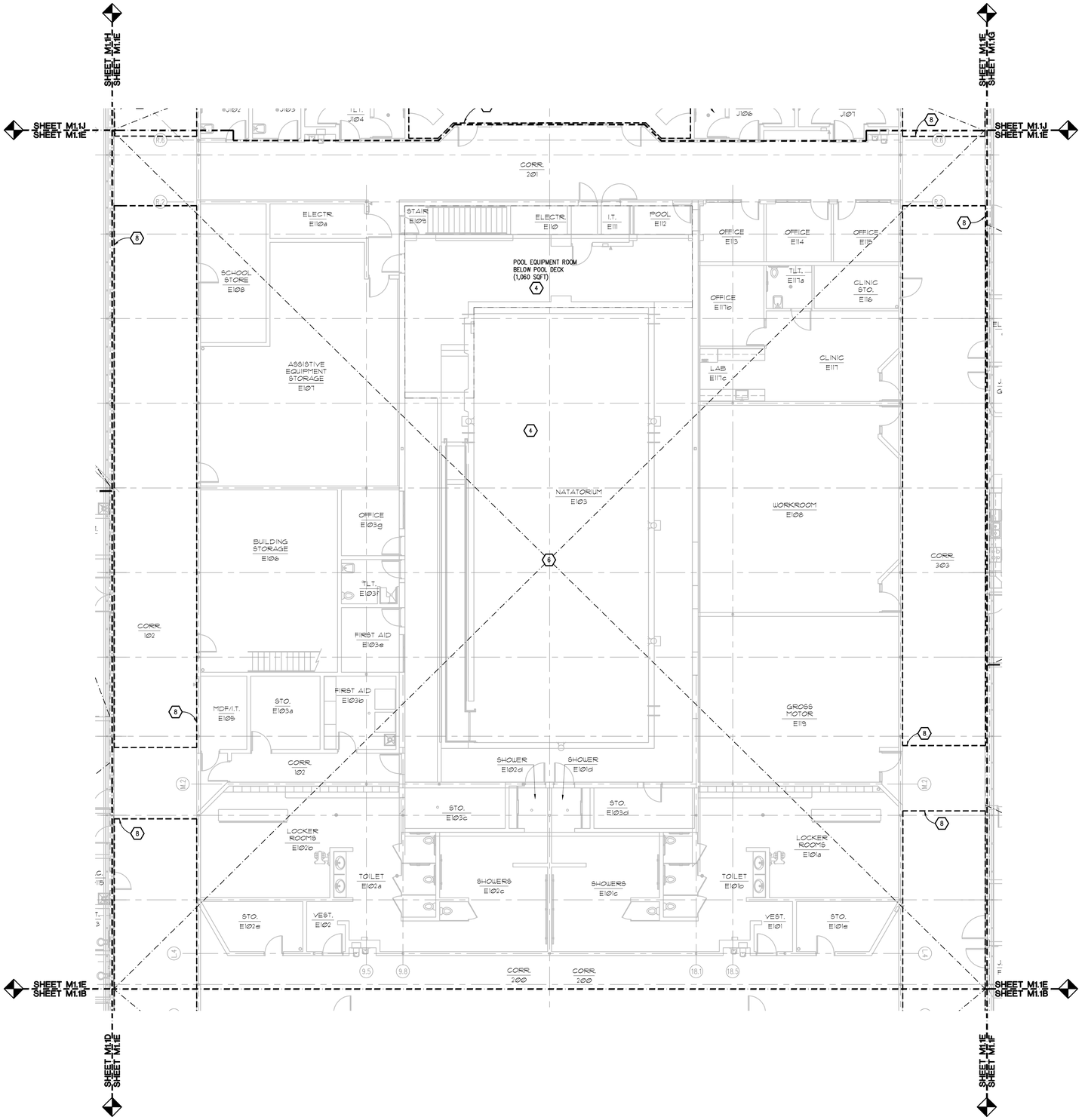

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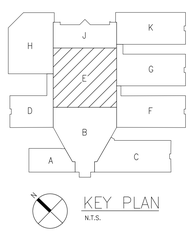
FIRE PROTECTION PLAN - ZONE E

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



KEY PLAN
N.T.S.

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

FIRE PROTECTION PLAN - ZONE E

ISSUE DATES

DATE:	ISSUED FOR:
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DRAWN KRD
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PROJECT NO.

19040

DRAWING NO.

M1.1E-BP3

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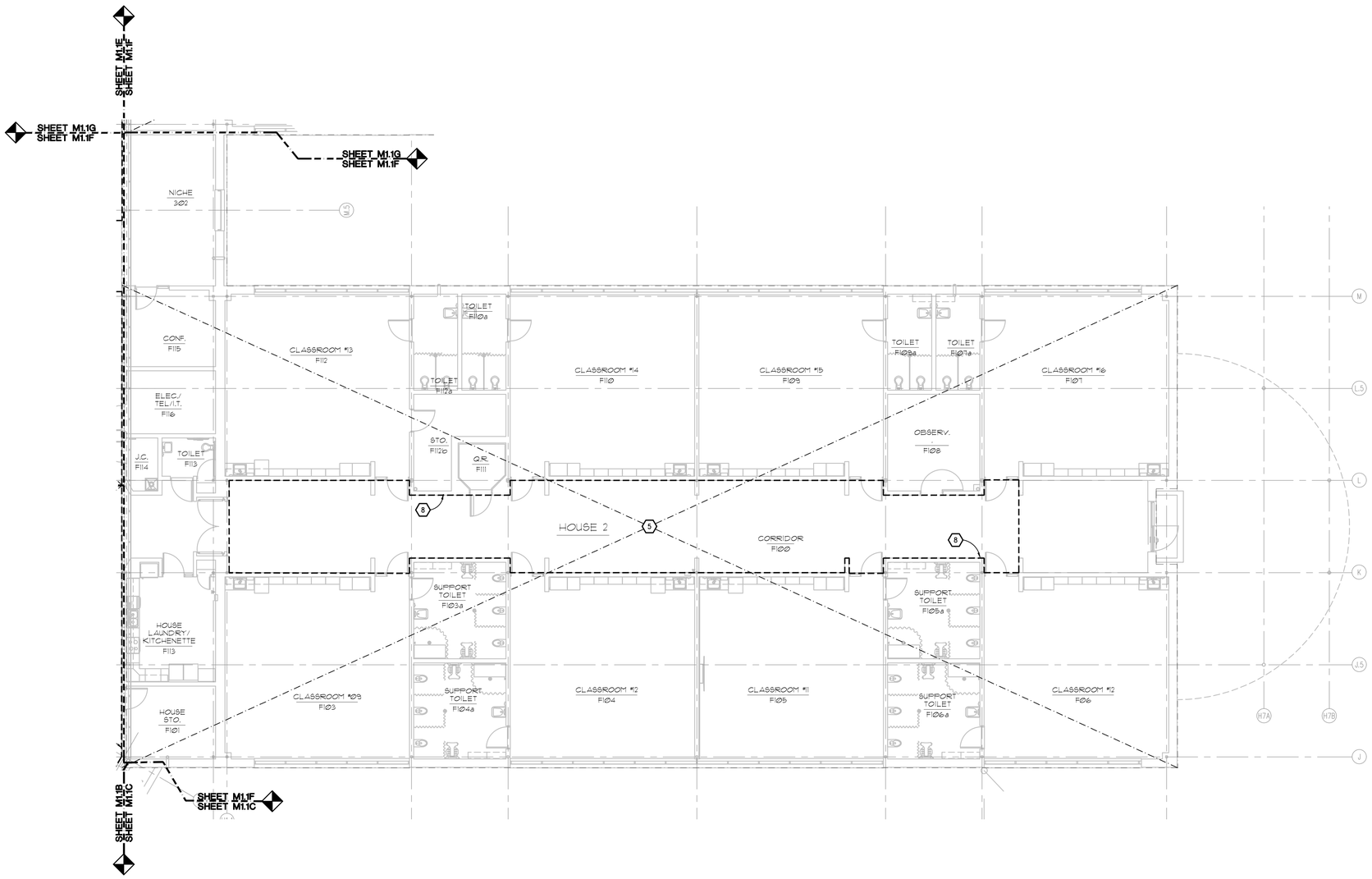

FIRE PROTECTION PLAN - ZONE F

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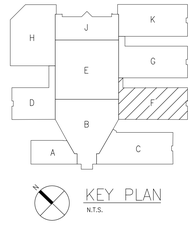

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PROJECT TITLE

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DRAWING TITLE

FIRE PROTECTION PLAN - ZONE F

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M1.1F-BP3

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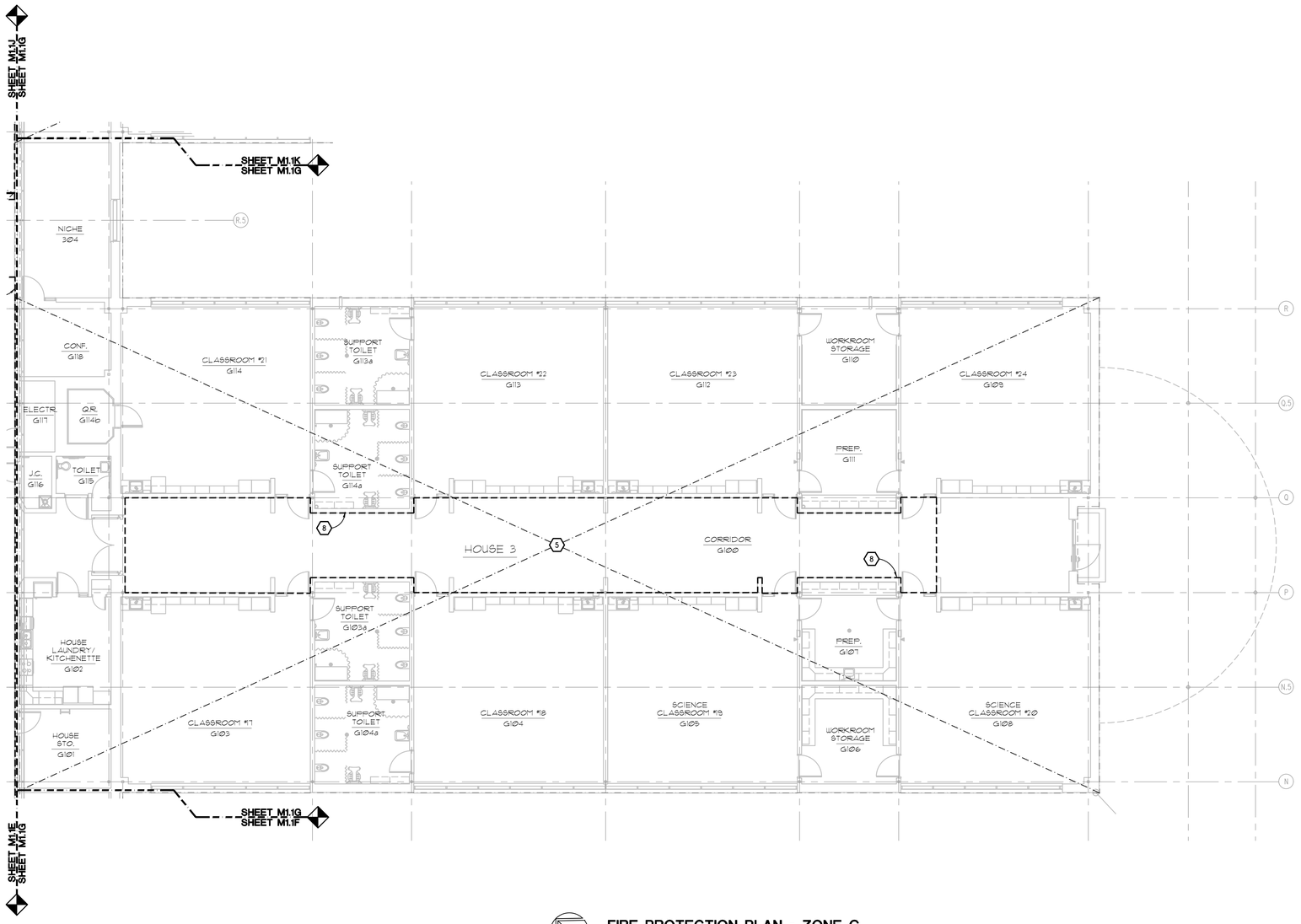

FIRE PROTECTION PLAN - ZONE G

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

FIRE PROTECTION GENERAL NOTES:

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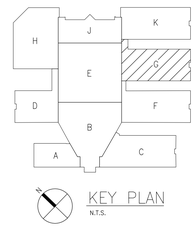
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. NO SPRINKLER PIPING SHALL BE ROUTED THROUGH ELECTRICAL EQUIPMENT ROOMS, TELECOMMUNICATION EQUIPMENT ROOMS, ELEVATOR EQUIPMENT ROOMS OR SIMILAR ROOMS. ONLY SPRINKLER PIPING SERVING SPRINKLERS HEADS IN THOSE ROOMS SHALL BE ALLOWED.
4. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
5. MINIMUM RUN-OUT PIPE SIZE TO SPRINKLER HEADS SHALL BE 1".
6. PROVIDE AN AUTOMATIC WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13 LIGHT HAZARD CLASSIFICATION. HYDRAULIC CALCULATIONS SHALL BE BASED ON DENSITY OF 0.10 GPM/SQ FT. OVER THE MOST REMOTE 1500 SQ. FT.
7. ACCORDING TO THE MOST RECENT FLOW TEST INFORMATION, THE STATIC PRESSURE AVAILABLE AT THE CITY WATER MAIN AT THE STREET IS 55 PSIG. RESIDUAL PRESSURE WITH 865 GPM FLOWING IS 16 PSIG. CONTRACTOR SHALL MAKE HIS OWN PRESSURE AND FLOW TEST PRIOR TO SYSTEM DESIGN.
8. FIRE PROTECTION WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

(#) CONSTRUCTION KEY NOTES:

1. PROVIDE FIRE SUPPRESSION COVERAGE FROM DRY PIPE SYSTEM.
2. PROVIDE DRY PIPE SYSTEM BRANCH TO SERVE NOTED AREAS.
3. PROVIDE INSPECTORS TEST STATION PER DETAIL.
4. PROVIDE GALVANIZED PIPE AND POLYESTER FINISHED SPRINKLER HEADS IN NATATORIUM AND NATATORIUM EQUIPMENT ROOM BELOW POOL DECK.
5. SERVED BY FIRE PROTECTION (ZONE 1).
6. SERVED BY FIRE PROTECTION (ZONE 2).
7. SERVED BY FIRE PROTECTION (ZONE 3).
8. PROVIDE SPRINKLER HEADS ABOVE AND BELOW CEILING IN AREAS INDICATED. COORDINATE EXACT AREAS WITH ARCHITECTURAL REFLECTED CEILING PLANS.



KEY PLAN
N.T.S.

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Mitchell and Mouat architects

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www.PeterBassoAssociates.com
PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

FIRE PROTECTION PLAN - ZONE G

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

PROJECT NO.

19040

DRAWING NO.

M1.1G-BP3

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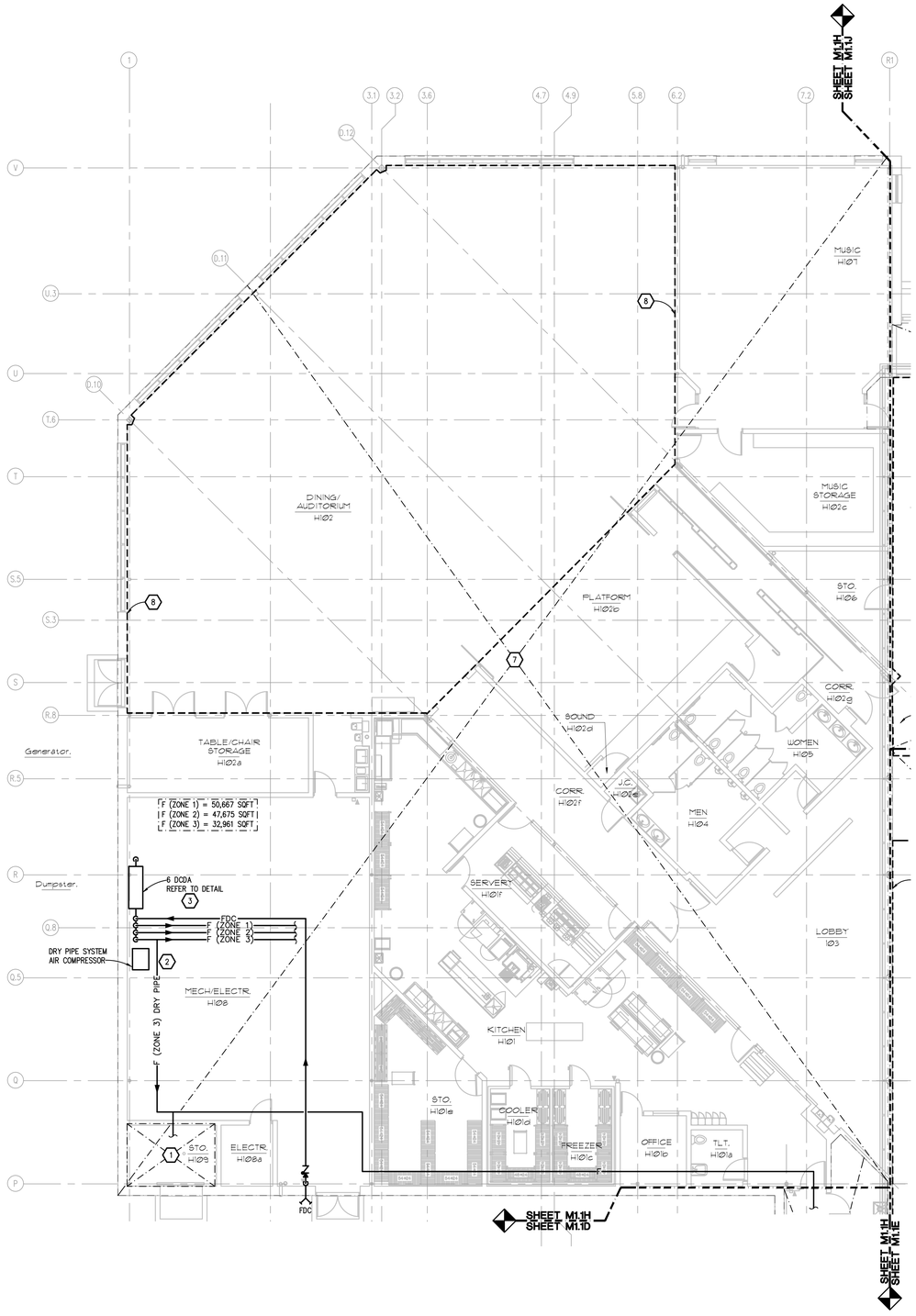

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(#) CONSTRUCTION KEY NOTES:

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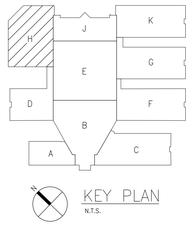
7. SERVED BY FIRE PROTECTION (ZONE 3).
8. PROVIDE SPRINKLER HEADS ABOVE AND BELOW CEILING IN AREAS INDICATED. COORDINATE EXACT AREAS WITH ARCHITECTURAL REFLECTED CEILING PLANS.

FIRE PROTECTION PLAN - ZONE H

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



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PROJECT TITLE

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1735 South Wagner Road
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DRAWING TITLE

FIRE PROTECTION PLAN - ZONE H

ISSUE DATES

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12-06-2019	DESIGN DEVELOPMENT
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DRAWN	KRD
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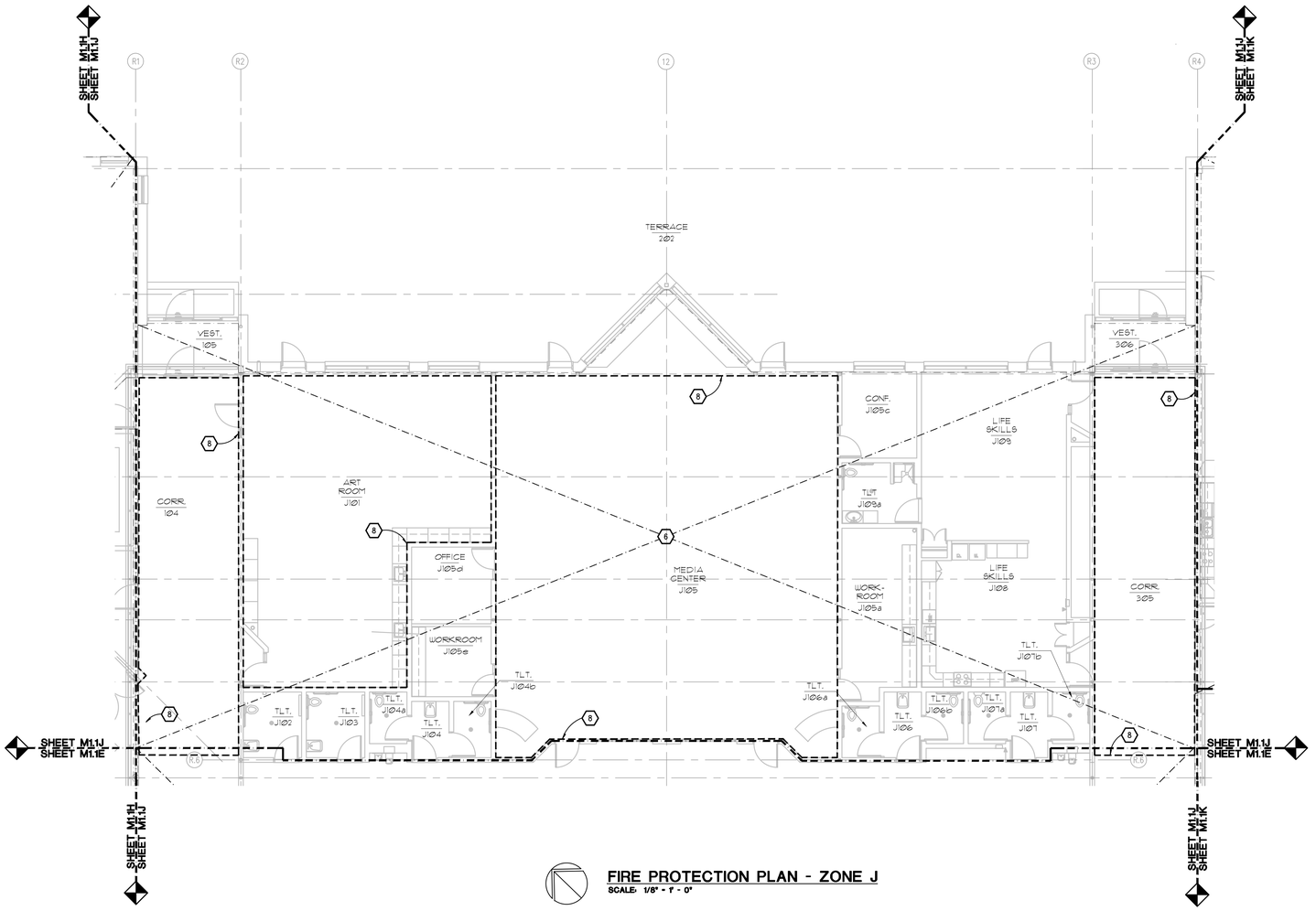

FIRE PROTECTION PLAN - ZONE J

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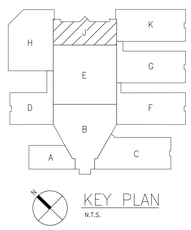

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PROJECT TITLE

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DRAWING TITLE

FIRE PROTECTION PLAN - ZONE J

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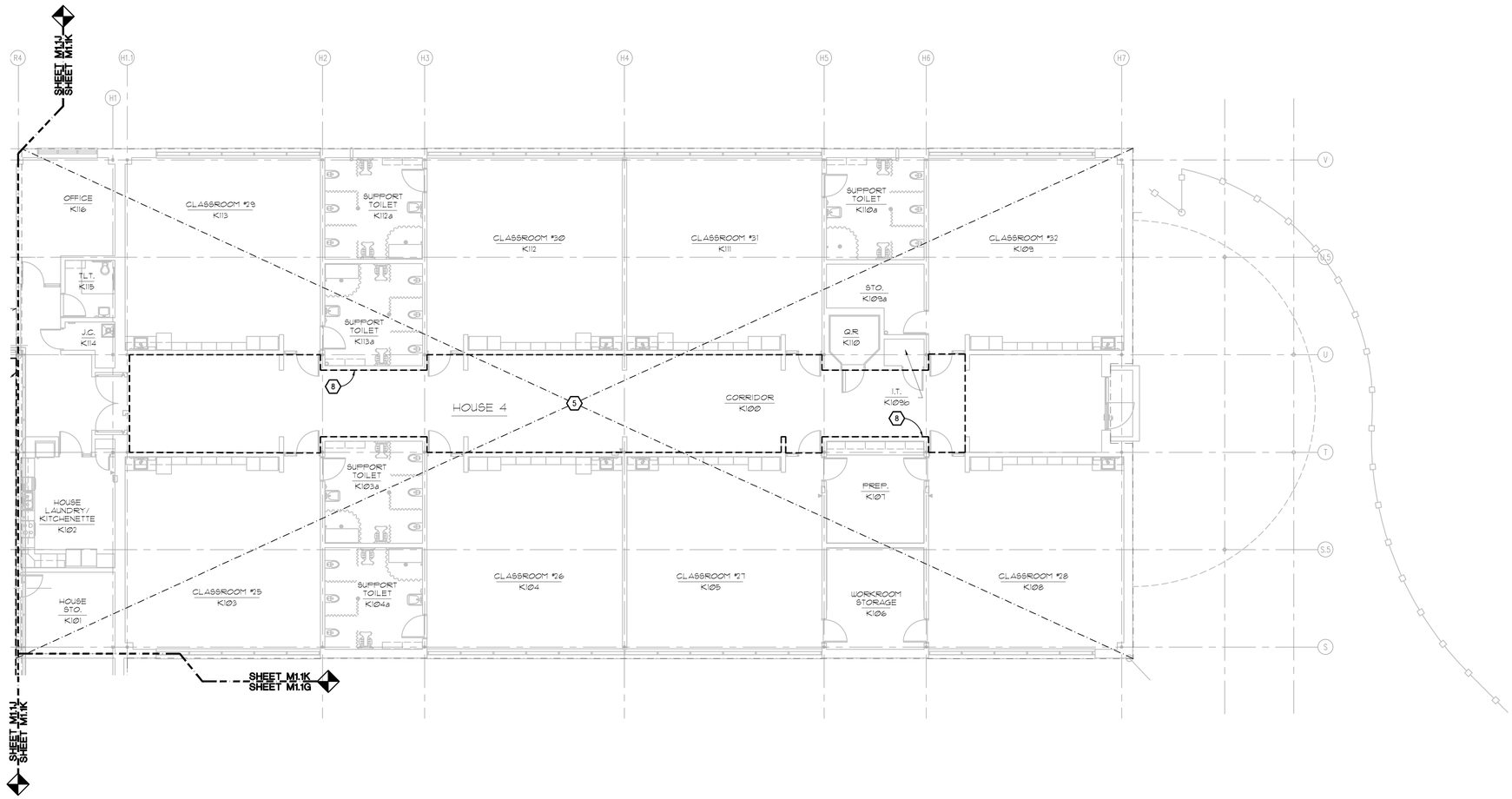

FIRE PROTECTION PLAN - ZONE K

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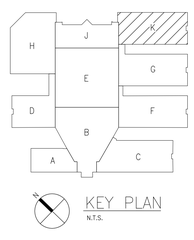

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PBA Project No.: 2019-0237

PROJECT TITLE

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Ann Arbor, Michigan

DRAWING TITLE

FIRE PROTECTION PLAN - ZONE K

ISSUE DATES

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DRAWN KRD
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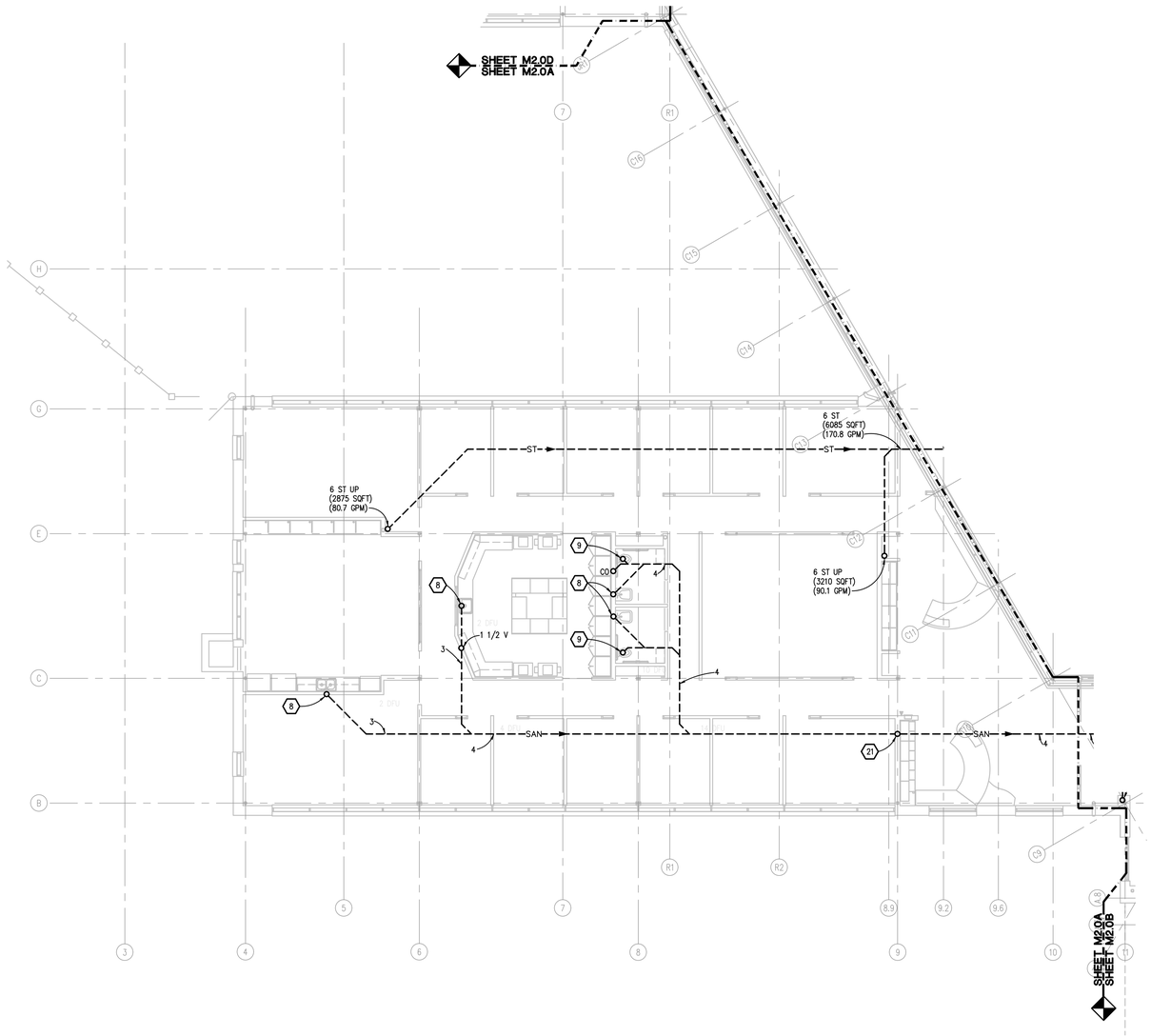

UNDERGROUND PLUMBING PLAN - ZONE A

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

PLUMBING GENERAL NOTES:

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3. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
11. WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1. CONNECT PSAN TO EXISTING SUMP PUMPS AND ROUTE AS INDICATED.
2. ROUTE 1/2 CW, 1/2 140°F HW, 3 SAN & 1 1/2 V IN WALL. ROUTE 1/2 CW & 1/2 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW, HW, SAN & V TO HAND SINK/LAVATORY.
3. 4 DOMESTIC WATER RPZDA AND WATER METER. REFER TO DETAIL.
4. BMS CONTROLLED SOLENOID VALVE ON CW PIPE SERVING EXTERIOR POST HYDRANT/WALL HYDRANT/SITE DRINKING FOUNTAIN. AT LOATIONS SERVING POST HYDRANTS AND SITE DRINKING FOUNTAIN, PROVIDE COMPRESSED AIR QUICK CONNECT FITTING DOWNSTREAM OF MANUAL ISOLATION VALVE FOR BLOWOUT/WINTERIZATION.
5. 3/4 CW MINIMUM 48 INCHES BELOW GRADE TO SERVE PAVILION POST HYDRANT. REFER TO SITE LOCATION ON DRAWING L1.
6. 2 AV FROM BULK CHEMICAL STORAGE TANK TO ATMOSPHERE. REFER TO POOL EQUIPMENT DRAWINGS.
7. ROUTE 3/4 CW & 3/4 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW & HW TO SINK. ROUTE IW FROM SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
8. 3 SAN TO LAV/SINK.
9. 4 SAN TO WC.
10. 3 SAN TO FLOOR DRAIN/SINK.
11. 3 SAN TO EWC.
12. 3 SAN TO UR.
13. 3 SAN TO WMSD.
14. 4 SAN TO FLOOR DRAIN/SINK.
15. 3 GSAN TO FLOOR DRAIN/SINK.
16. 3 GSAN TO SINK.
17. ALTERNATE NO. 5: REMOVE AND REPLACE EXISTING POOL DECK DRAIN STRAINER.
18. ROUTE 3/4 HW FROM SINK THROUGH AN ISOLATION VALVE AND CONNECT TO DISHWASHER. ROUTE WASTE FROM DISHWASHER AND CONNECT TO GARBAGE DISPOSAL ON SINK.
19. ROUTE 3/4 CW AND 3/4 HW FROM UNDERGROUND TO HAND SINK IN FLOOR ABOVE.
20. ROUTE 3/4 CW FROM UNDERGROUND TO FOOD COUNTER IN FLOOR ABOVE.
21. ROUTE SAN/ST PIPING TO WALL CLEANOUT MOUNTED 18" A.F.F. REFER TO FIRST FLOOR PLAN FOR DIRECTION OF CLEANOUT OPENING.
22. ROUTE CW, HW AND HWR PIPING TO DWH-1 AND DWH-2. REFER TO BUILDING CONDENSING WATER HEATERS WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM.
23. ROUTE CW, HW AND HWR PIPING TO DWH-3. REFER TO KITCHEN GAS FIRED WATER HEATER PIPING DIAGRAM.
24. INSTALL SHUT OFF VALVES IN CW AND HW BRANCH PIPING INDICATED.
25. ROUTE 3/4 CW & 3/4 140°F HW THROUGH CODE REQUIRED BACKFLOW PREVENTERS AND CONNECT TO DISHMACHINE. ROUTE IW FROM DISHMACHINE AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
26. ROUTE 3/4 CW & 3/4 140°F HW IN WALL AND CONNECT TO 3 COMPARTMENT SINK. ROUTE 3 GSAN & 1 1/2 V AND CONNECT TO WASH COMPARTMENT OF 3 COMPARTMENT SINK. ROUTE 3 IW FROM RINSE AND SANITIZE COMPARTMENTS OF 3 COMPARTMENT SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
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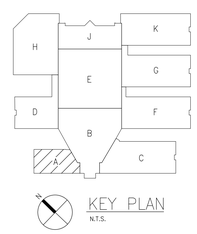
34. ROUTE PIPING HIGHER UP IN MEZZANINE AREA.
35. WORK INDICATED AS PART OF ALTERNATE#3.
36. ROUTE CONDENSATE/PUMPED CONDENSATE DRAIN AS INDICATED FROM ACU TO SERVICE SINK.
37. INSTALL DOWNSPOUT NOZZLE AT INDICATED ELEVATION ABOVE GRADE, ON EXTERIOR WALL.



KEY PLAN
N.T.S.

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www.PeterBassoAssociates.com
PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE A

ISSUE DATES

05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN KRD
CHECKED SVM
APPROVED RNR

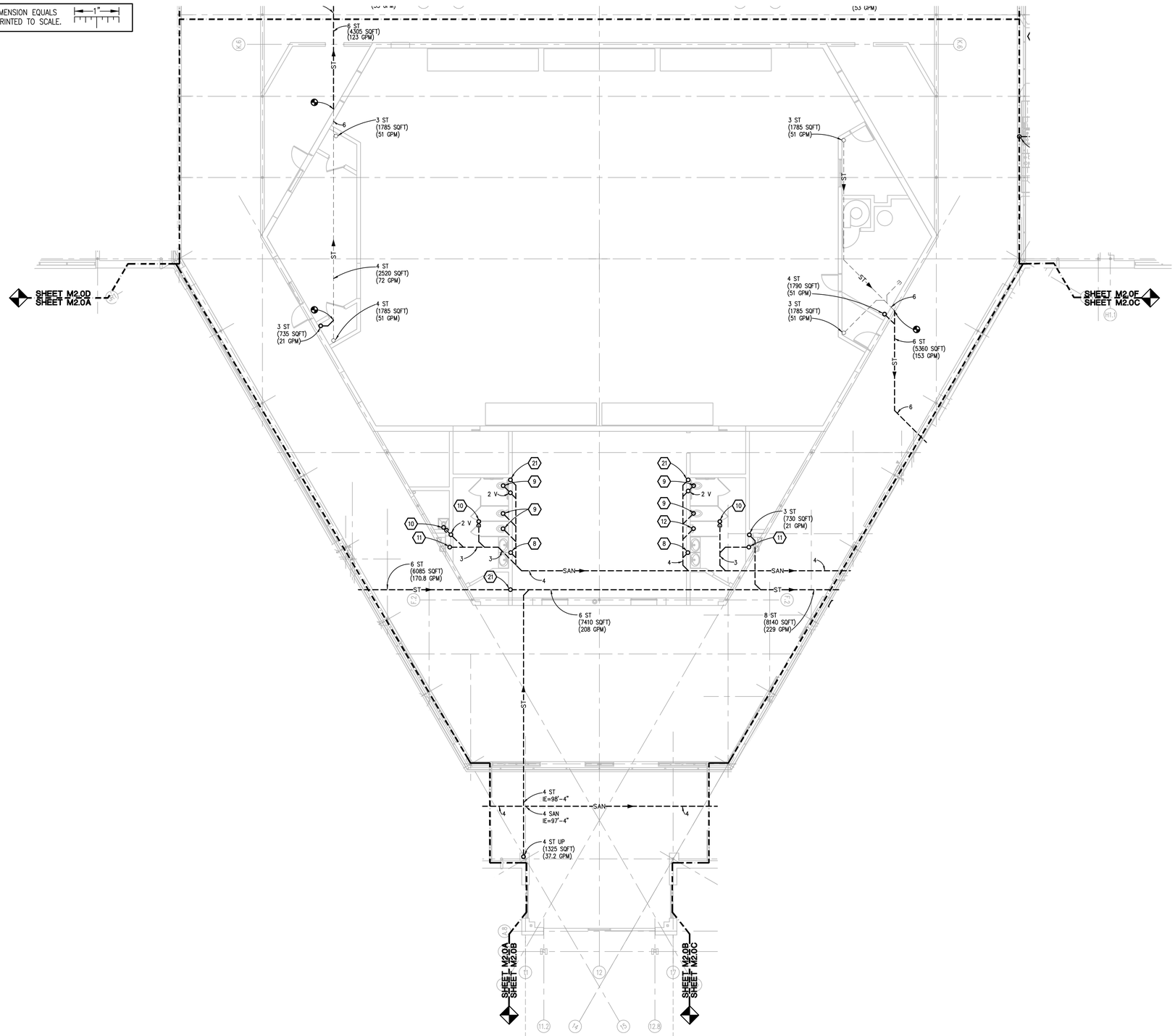
PROJECT NO.

19040

DRAWING NO.

M2.0A-BP3

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



PLUMBING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
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5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
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CONSTRUCTION KEY NOTES:

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3. 4 DOMESTIC WATER RPZDA AND WATER METER. REFER TO DETAIL.
4. BMS CONTROLLED SOLENOID VALVE ON CW PIPE SERVING EXTERIOR POST HYDRANT/WALL HYDRANT/SITE DRINKING FOUNTAIN. AT LOATIONS SERVING POST HYDRANTS AND SITE DRINKING FOUNTAIN, PROVIDE COMPRESSED AIR QUICK CONNECT FITTING DOWNSTREAM OF MANUAL ISOLATION VALVE FOR BLOWOUT/WINTERIZATION.
5. 3/4 CW MINIMUM 48 INCHES BELOW GRADE TO SERVE PAVILION POST HYDRANT. REFER TO SITE LOCATION ON DRAWING L1.
6. 2 AV FROM BULK CHEMICAL STORAGE TANK TO ATMOSPHERE. REFER TO POOL EQUIPMENT DRAWINGS.
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23. ROUTE CW, HW AND HWR PIPING TO DWH-3. REFER TO KITCHEN GAS FIRED WATER HEATER PIPING DIAGRAM.
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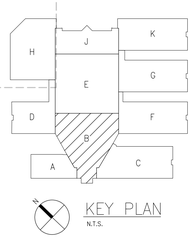
UNDERGROUND PLUMBING PLAN - ZONE B

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



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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE B

ISSUE DATES

05-27-2020	FOR CONSTRUCTION - BID PACK #3
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08-12-2019	SCHEMATIC DESIGN

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DRAWN KRD
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PROJECT NO.
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M2.0B-BP3

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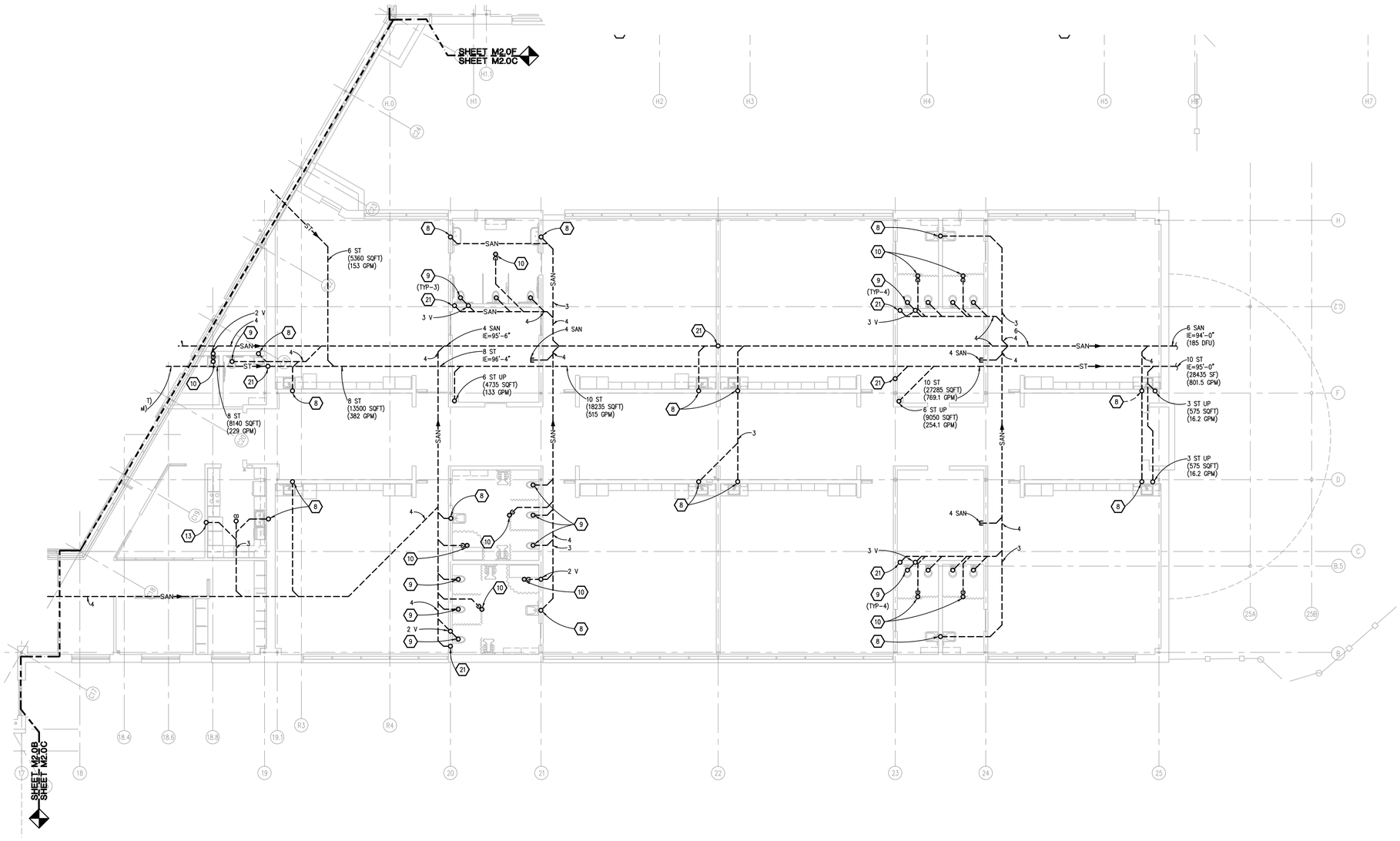

UNDERGROUND PLUMBING PLAN - ZONE C

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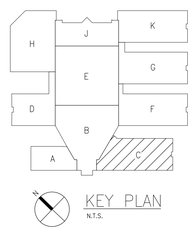

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
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DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE C

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

PROJECT NO.

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DRAWING NO.

M2.0C-BP3

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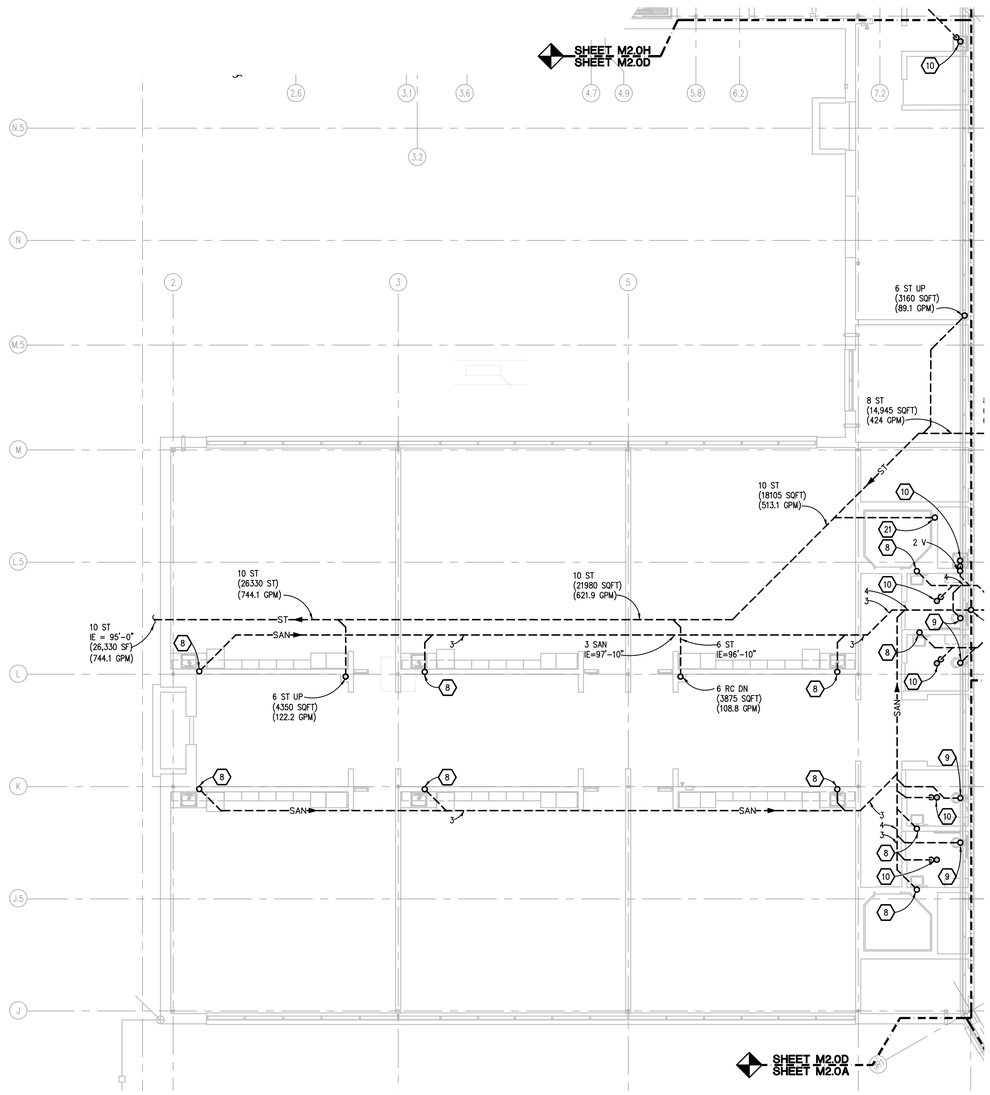

UNDERGROUND PLUMBING PLAN - ZONE D
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21. ROUTE SAN/ST PIPING TO WALL CLEANOUT MOUNTED 18" A.F.F. REFER TO FIRST FLOOR PLAN FOR DIRECTION OF CLEANOUT OPENING.
22. ROUTE CW, HW AND HWR PIPING TO DWH-1 AND DWH-2. REFER TO BUILDING CONDENSING WATER HEATERS WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM.
23. ROUTE CW, HW AND HWR PIPING TO DWH-3. REFER TO KITCHEN GAS FIRED WATER HEATER PIPING DIAGRAM.
24. INSTALL SHUT OFF VALVES IN CW AND HW BRANCH PIPING INDICATED.
25. ROUTE 3/4 CW & 3/4 140°F HW THROUGH CODE REQUIRED BACKFLOW PREVENTERS AND CONNECT TO DISHMACHINE. ROUTE IW FROM DISHMACHINE AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
26. ROUTE 3/4 CW & 3/4 140°F HW IN WALL AND CONNECT TO 3 COMPARTMENT SINK. ROUTE 3 GSAN & 1 1/2 V AND CONNECT TO WASH COMPARTMENT OF 3 COMPARTMENT SINK. ROUTE 3 IW FROM RINSE AND SANITIZE COMPARTMENTS OF 3 COMPARTMENT SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
27. ROUTE 3/4 CW, 3/4 140°F HW, 3 GSAN & 1 1/2 V IN WALL. ROUTE 3/4 CW & 3/4 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW, HW, GSAN & V TO PRE-SPRAY.
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30. 1 1/4 G TO CONVECTION OVEN.
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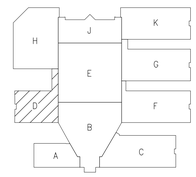
32. 3/4 CW & 3/4 140°F HW TO UNDERGROUND TO SERVE KITCHEN EQUIPMENT. UNDERGROUND PIPING SHALL BE SOFT COPPER WITH NO JOINTS OR FITTINGS.
33. 3/4 CW TO UNDERGROUND TO SERVE KITCHEN EQUIPMENT. UNDERGROUND PIPING SHALL BE SOFT COPPER WITH NO JOINTS OR FITTINGS.
34. ROUTE PIPING HIGHER UP IN MEZZANINE AREA.
35. WORK INDICATED AS PART OF ALTERNATE#3.
36. ROUTE CONDENSATE/PUMPED CONDENSATE DRAIN AS INDICATED FROM ACU TO SERVICE SINK.
37. INSTALL DOWNSPOUT NOZZLE AT INDICATED ELEVATION ABOVE GRADE, ON EXTERIOR WALL.



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www.PeterBassoAssociates.com
PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE
UNDERGROUND PLUMBING PLAN - ZONE D

ISSUE DATES

DATE:	ISSUED FOR:
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05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.
19040

DRAWING NO.
M2.0D-BP3

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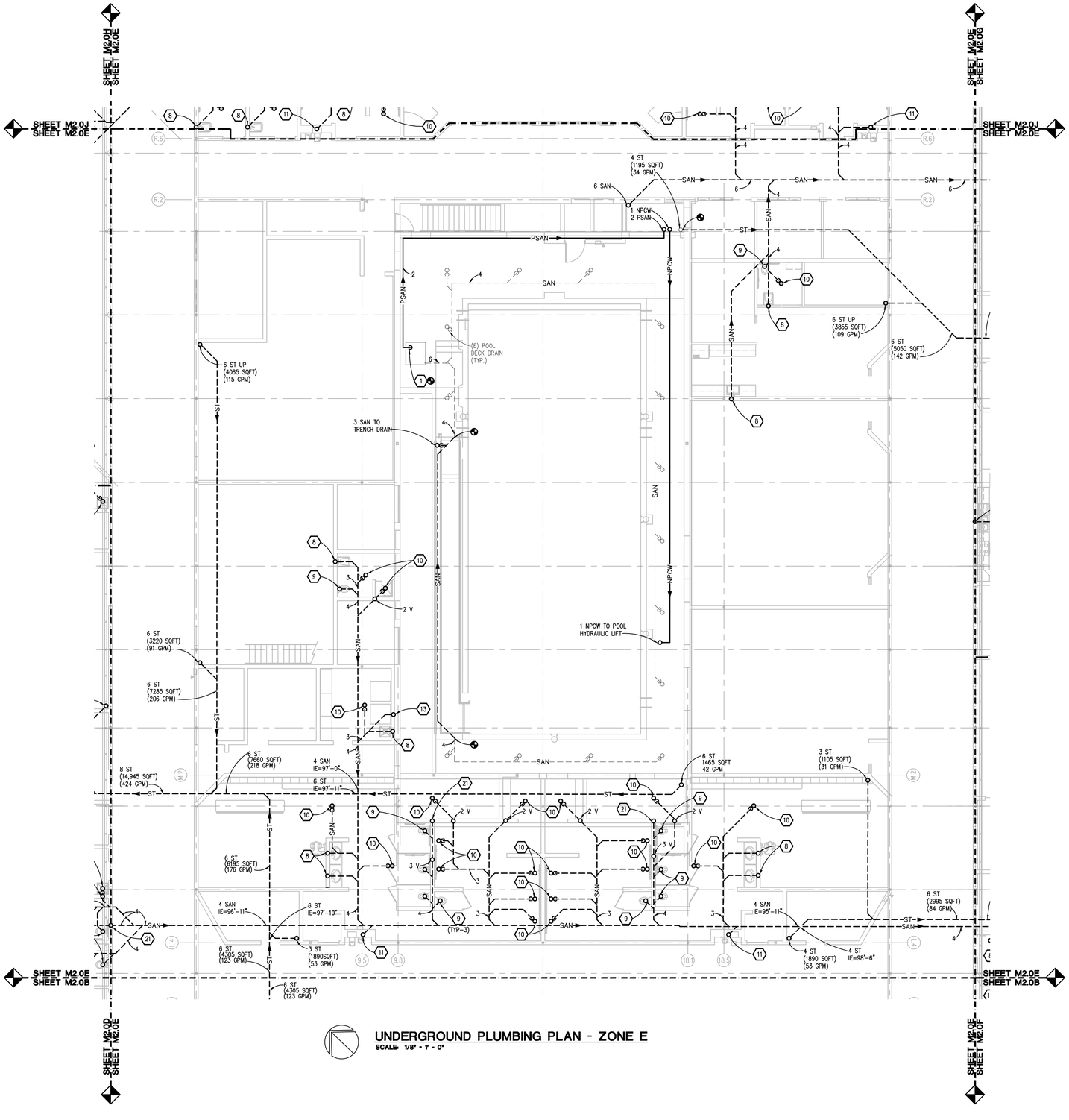

UNDERGROUND PLUMBING PLAN - ZONE E

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

PLUMBING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
11. WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

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3. 4 DOMESTIC WATER RPZDA AND WATER METER. REFER TO DETAIL.
4. BMS CONTROLLED SOLENOID VALVE ON CW PIPE SERVING EXTERIOR POST HYDRANT/WALL HYDRANT/SITE DRINKING FOUNTAIN. AT LOATIONS SERVING POST HYDRANTS AND SITE DRINKING FOUNTAIN, PROVIDE COMPRESSED AIR QUICK CONNECT FITTING DOWNSTREAM OF MANUAL ISOLATION VALVE FOR BLOWOUT/WINTERIZATION.
5. 3/4 CW MINIMUM 48 INCHES BELOW GRADE TO SERVE PAVILION POST HYDRANT. REFER TO SITE LOCATION ON DRAWING L1.
6. 2 AV FROM BULK CHEMICAL STORAGE TANK TO ATMOSPHERE. REFER TO POOL EQUIPMENT DRAWINGS.
7. ROUTE 3/4 CW & 3/4 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW & HW TO SINK. ROUTE IW FROM SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
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16. 3 GSAN TO SINK.
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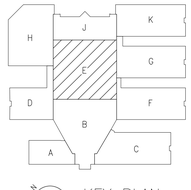

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1735 South Wagner Road
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DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE E

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DRAWN KRD
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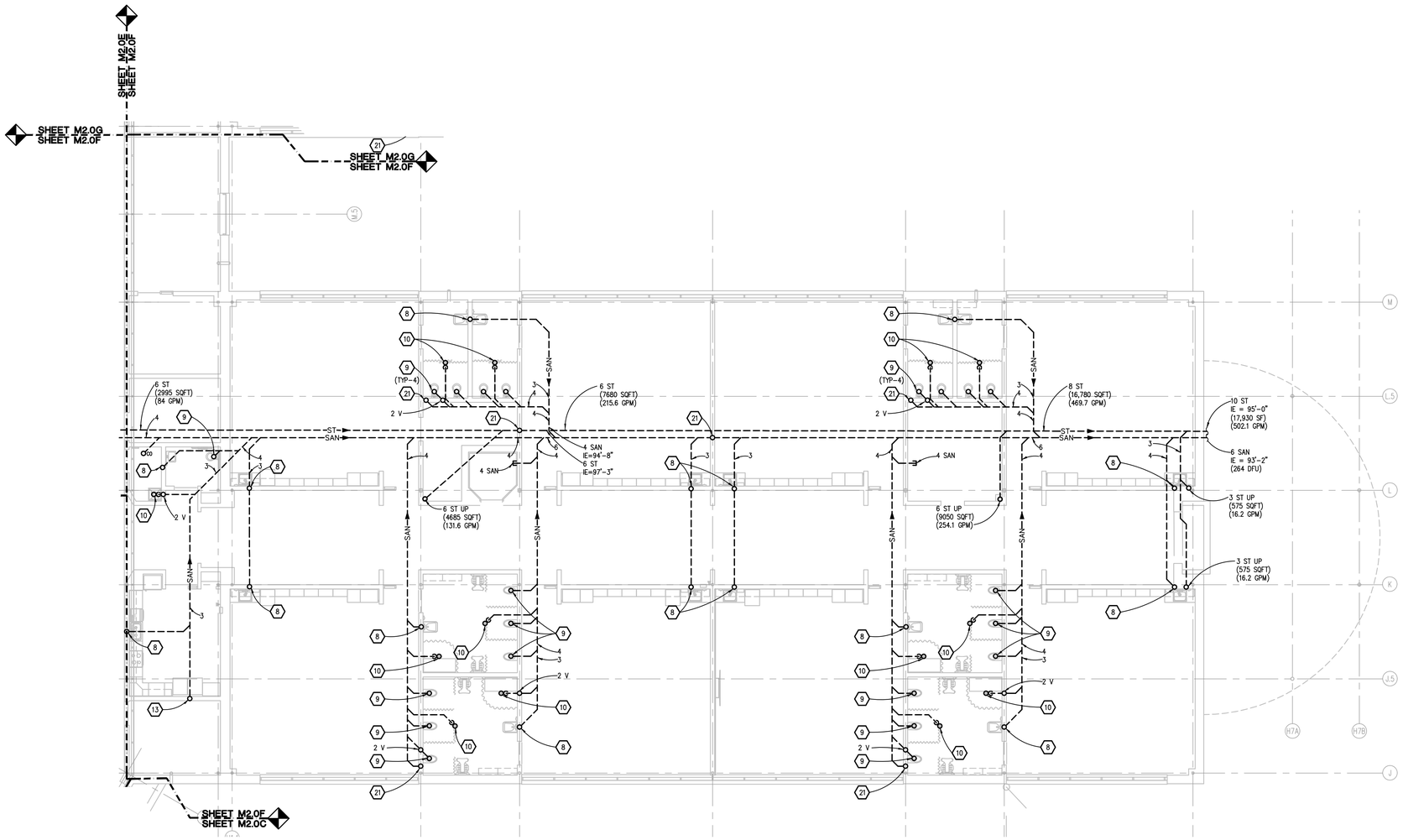

UNDERGROUND PLUMBING PLAN - ZONE F

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

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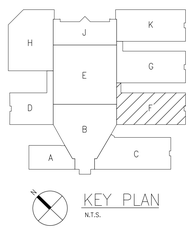

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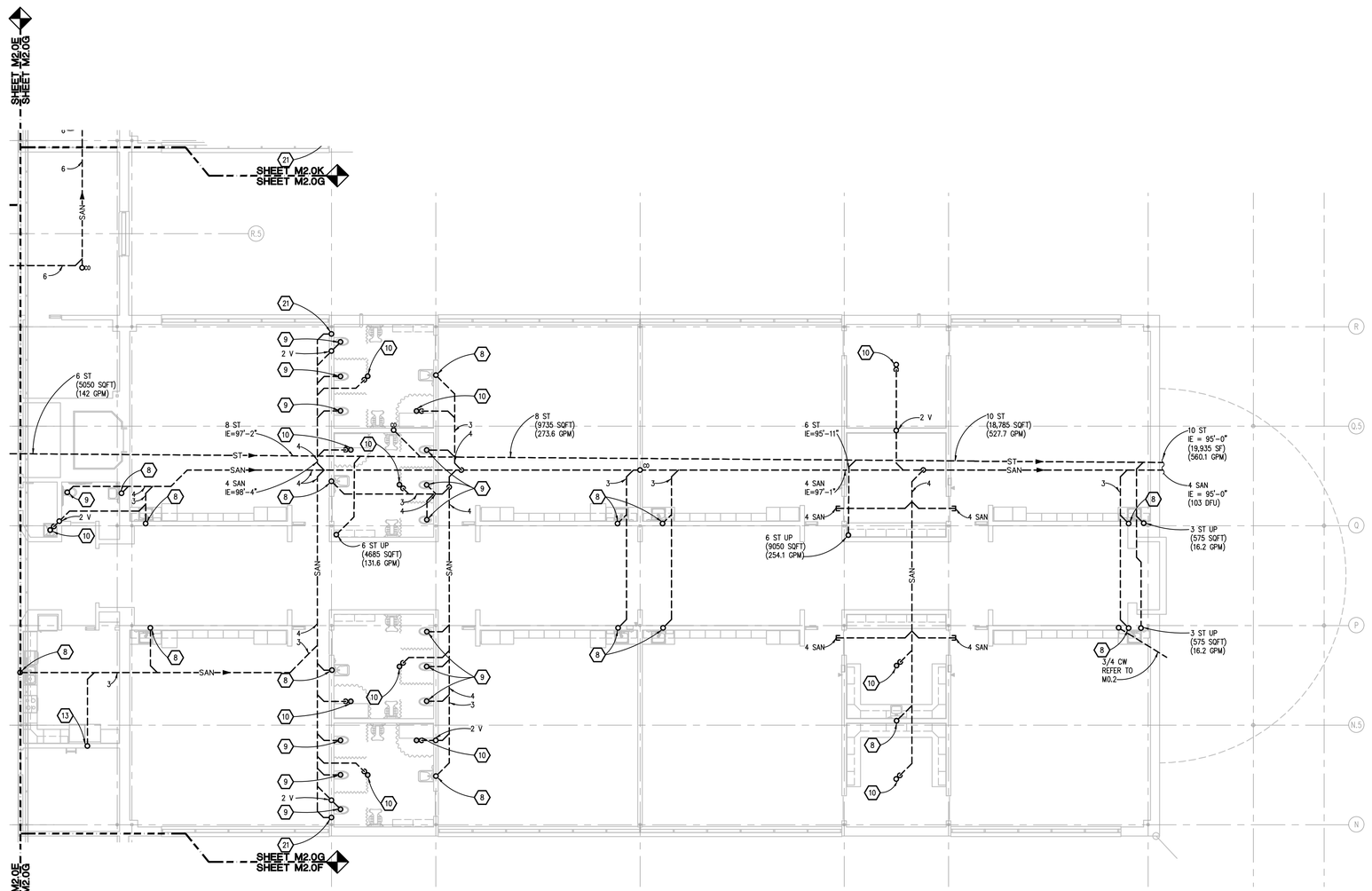

UNDERGROUND PLUMBING PLAN - ZONE G

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8. 3 SAN TO LAV/SINK.
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10. 3 SAN TO FLOOR DRAIN/SINK.
11. 3 SAN TO EWC.
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16. 3 GSAN TO SINK.
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18. ROUTE 3/4 HW FROM SINK THROUGH AN ISOLATION VALVE AND CONNECT TO DISHWASHER. ROUTE WASTE FROM DISHWASHER AND CONNECT TO GARBAGE DISPOSAL ON SINK.
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20. ROUTE 3/4 CW FROM UNDERGROUND TO FOOD COUNTER IN FLOOR ABOVE.
21. ROUTE SAN/ST PIPING TO WALL CLEANOUT MOUNTED 18" A.F.F. REFER TO FIRST FLOOR PLAN FOR DIRECTION OF CLEANOUT OPENING.
22. ROUTE CW, HW AND HWR PIPING TO DWH-1 AND DWH-2. REFER TO BUILDING CONDENSING WATER HEATERS WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM.
23. ROUTE CW, HW AND HWR PIPING TO DWH-3. REFER TO KITCHEN GAS FIRED WATER HEATER PIPING DIAGRAM.
24. INSTALL SHUT OFF VALVES IN CW AND HW BRANCH PIPING INDICATED.
25. ROUTE 3/4 CW & 3/4 140°F HW THROUGH CODE REQUIRED BACKFLOW PREVENTERS AND CONNECT TO DISHMACHINE. ROUTE IW FROM DISHMACHINE AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
26. ROUTE 3/4 CW & 3/4 140°F HW IN WALL AND CONNECT TO 3 COMPARTMENT SINK. ROUTE 3 GSAN & 1 1/2 V AND CONNECT TO WASH COMPARTMENT OF 3 COMPARTMENT SINK. ROUTE 3 IW FROM RINSE AND SANITIZE COMPARTMENTS OF 3 COMPARTMENT SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
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30. 1 1/4 G TO CONVECTION OVEN.
31. 3/4 CW TO HOT PAN FILLING FAUCET.
32. 3/4 CW & 3/4 140°F HW TO UNDERGROUND TO SERVE KITCHEN EQUIPMENT. UNDERGROUND PIPING SHALL BE SOFT COPPER WITH NO JOINTS OR FITTINGS.
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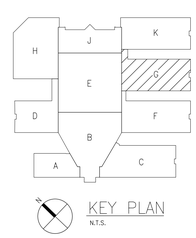
34. ROUTE PIPING HIGHER UP IN MEZZANINE AREA.
35. WORK INDICATED AS PART OF ALTERNATE#3.
36. ROUTE CONDENSATE/PUMPED CONDENSATE DRAIN AS INDICATED FROM ACU TO SERVICE SINK.
37. INSTALL DOWNSPOUT NOZZLE AT INDICATED ELEVATION ABOVE GRADE, ON EXTERIOR WALL.



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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE G

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN KRD
CHECKED SVM
APPROVED RNR

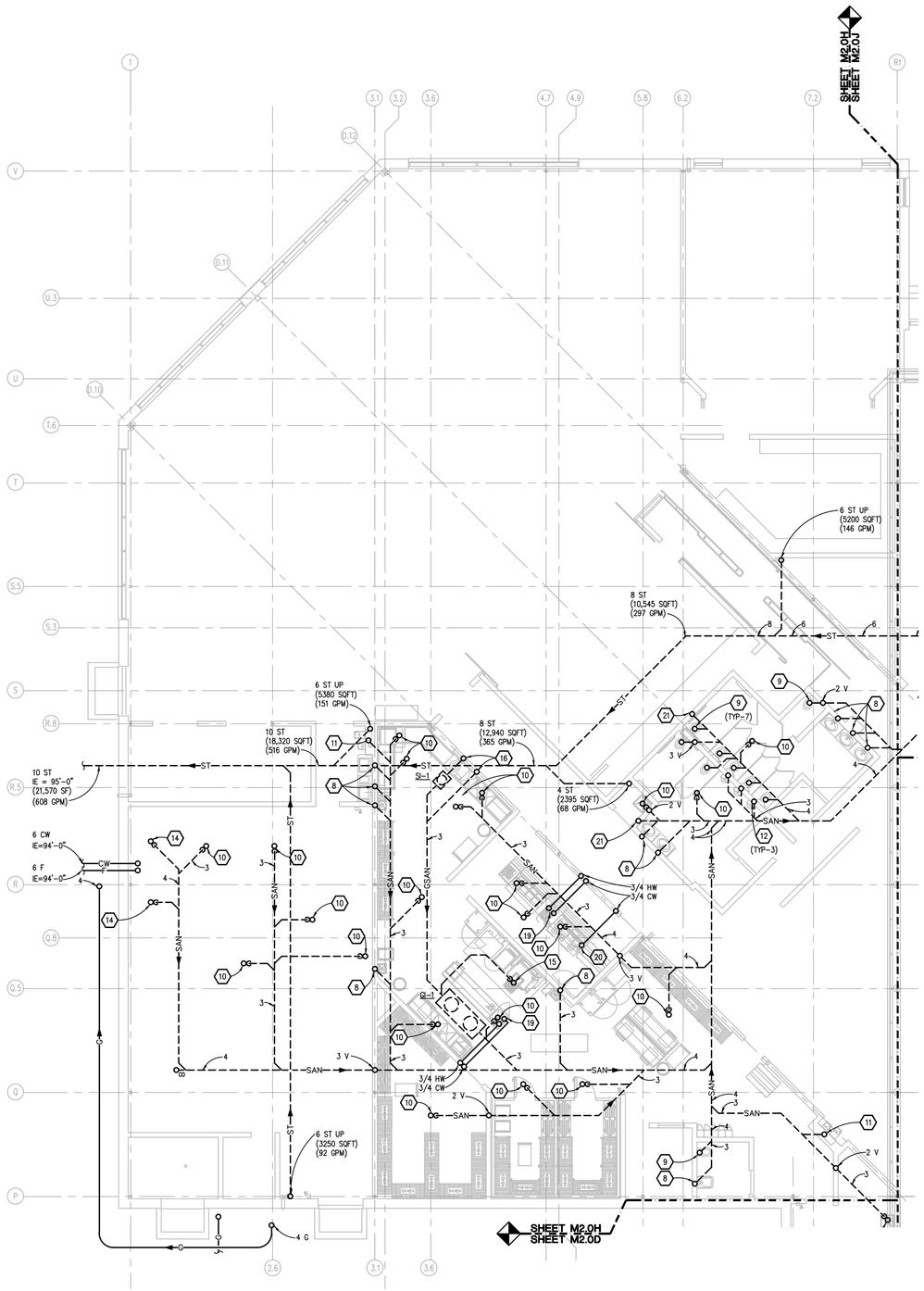
PROJECT NO.

19040

DRAWING NO.

M2.0G-BP3

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



UNDERGROUND PLUMBING PLAN - ZONE H

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

PLUMBING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
11. WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1. CONNECT PSAN TO EXISTING SUMP PUMPS AND ROUTE AS INDICATED.
2. ROUTE 1/2 CW, 1/2 140°F HW, 3 SAN & 1 1/2 V IN WALL. ROUTE 1/2 CW & 1/2 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW, HW, SAN & V TO HAND SINK/LAVATORY.
3. 4 DOMESTIC WATER RPZDA AND WATER METER. REFER TO DETAIL.
4. BMS CONTROLLED SOLENOID VALVE ON CW PIPE SERVING EXTERIOR POST HYDRANT/WALL HYDRANT/SITE DRINKING FOUNTAIN. AT LOATIONS SERVING POST HYDRANTS AND SITE DRINKING FOUNTAIN, PROVIDE COMPRESSED AIR QUICK CONNECT FITTING DOWNSTREAM OF MANUAL ISOLATION VALVE FOR BLOWOUT/WINTERIZATION.
5. 3/4 CW MINIMUM 48 INCHES BELOW GRADE TO SERVE PAVILION POST HYDRANT. REFER TO SITE LOCATION ON DRAWING L1.
6. 2 AV FROM BULK CHEMICAL STORAGE TANK TO ATMOSPHERE. REFER TO POOL EQUIPMENT DRAWINGS.
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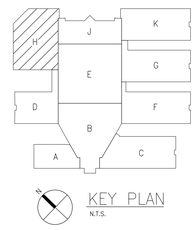

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DRAWING TITLE

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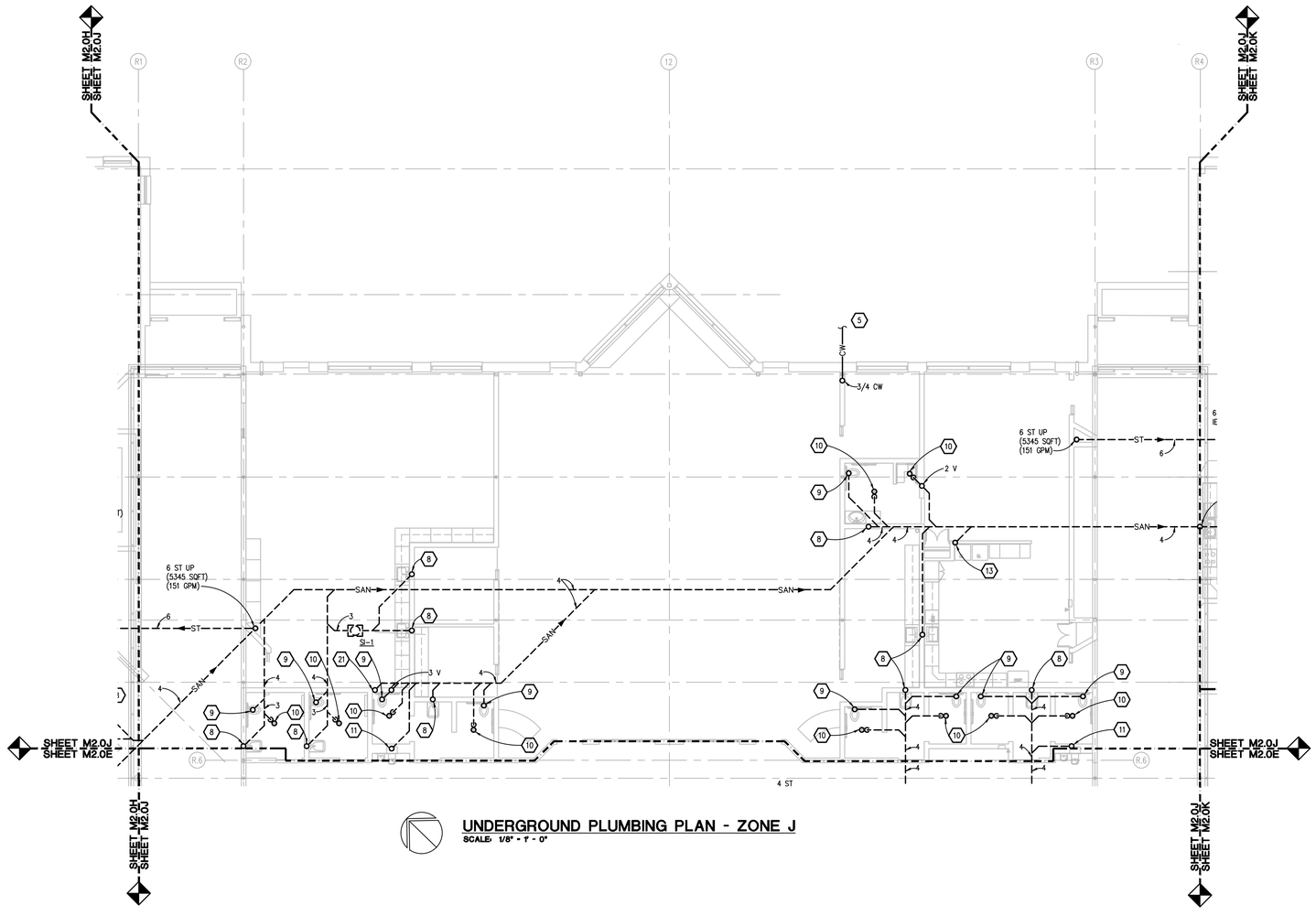

UNDERGROUND PLUMBING PLAN - ZONE J

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

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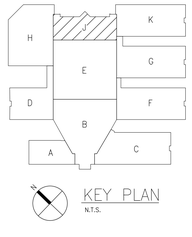

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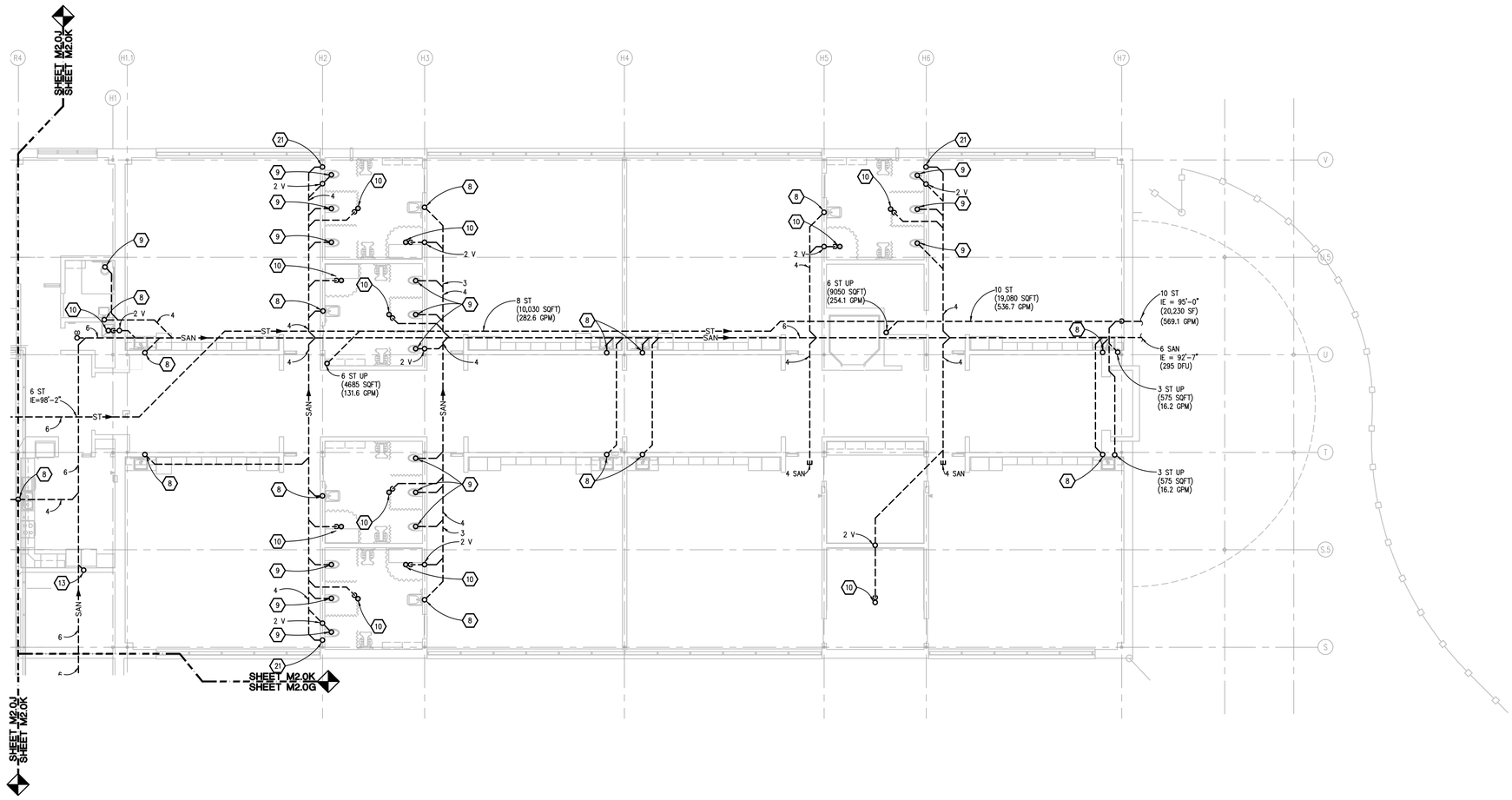

UNDERGROUND PLUMBING PLAN - ZONE K

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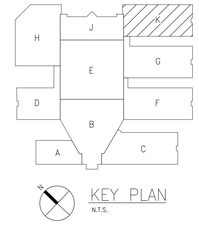
2. ROUTE 1/2 CW, 1/2 140°F HW, 3 SAN & 1 1/2 V IN WALL. ROUTE 1/2 CW & 1/2 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW, HW, SAN & V TO HAND SINK/LAVATORY.
3. 4 DOMESTIC WATER RPZDA AND WATER METER. REFER TO DETAIL.
4. BMS CONTROLLED SOLENOID VALVE ON CW PIPE SERVING EXTERIOR POST HYDRANT/WALL HYDRANT/SITE DRINKING FOUNTAIN. AT LOATIONS SERVING POST HYDRANTS AND SITE DRINKING FOUNTAIN, PROVIDE COMPRESSED AIR QUICK CONNECT FITTING DOWNSTREAM OF MANUAL ISOLATION VALVE FOR BLOWOUT/WINTERIZATION.
5. 3/4 CW MINIMUM 48 INCHES BELOW GRADE TO SERVE PAVILION POST HYDRANT. REFER TO SITE LOCATION ON DRAWING L1.
6. 2 AV FROM BULK CHEMICAL STORAGE TANK TO ATMOSPHERE. REFER TO POOL EQUIPMENT DRAWINGS.
7. ROUTE 3/4 CW & 3/4 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW & HW TO SINK. ROUTE IW FROM SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
8. 3 SAN TO LAV/SINK.
9. 4 SAN TO WC.
10. 3 SAN TO FLOOR DRAIN/SINK.
11. 3 SAN TO EWC.
12. 3 SAN TO UR.
13. 3 SAN TO WMSD.
14. 4 SAN TO FLOOR DRAIN/SINK.
15. 3 GSAN TO FLOOR DRAIN/SINK.
16. 3 GSAN TO SINK.
17. ALTERNATE NO. 5: REMOVE AND REPLACE EXISTING POOL DECK DRAIN STRAINER.
18. ROUTE 3/4 HW FROM SINK THROUGH AN ISOLATION VALVE AND CONNECT TO DISHWASHER. ROUTE WASTE FROM DISHWASHER AND CONNECT TO GARBAGE DISPOSAL ON SINK.
19. ROUTE 3/4 CW AND 3/4 HW FROM UNDERGROUND TO HAND SINK IN FLOOR ABOVE.
20. ROUTE 3/4 CW FROM UNDERGROUND TO FOOD COUNTER IN FLOOR ABOVE.
21. ROUTE SAN/ST PIPING TO WALL CLEANOUT MOUNTED 18" A.F.F. REFER TO FIRST FLOOR PLAN FOR DIRECTION OF CLEANOUT OPENING.
22. ROUTE CW, HW AND HWR PIPING TO DWH-1 AND DWH-2. REFER TO BUILDING CONDENSING WATER HEATERS WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM.
23. ROUTE CW, HW AND HWR PIPING TO DWH-3. REFER TO KITCHEN GAS FIRED WATER HEATER PIPING DIAGRAM.
24. INSTALL SHUT OFF VALVES IN CW AND HW BRANCH PIPING INDICATED.
25. ROUTE 3/4 CW & 3/4 140°F HW THROUGH CODE REQUIRED BACKFLOW PREVENTERS AND CONNECT TO DISHMACHINE. ROUTE IW FROM DISHMACHINE AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
26. ROUTE 3/4 CW & 3/4 140°F HW IN WALL AND CONNECT TO 3 COMPARTMENT SINK. ROUTE 3 GSAN & 1 1/2 V AND CONNECT TO WASH COMPARTMENT OF 3 COMPARTMENT SINK. ROUTE 3 IW FROM RINSE AND SANITIZE COMPARTMENTS OF 3 COMPARTMENT SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
27. ROUTE 3/4 CW, 3/4 140°F HW, 3 GSAN & 1 1/2 V IN WALL. ROUTE 3/4 CW & 3/4 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW, HW, GSAN & V TO PRE-SPRAY.
28. ROUTE 3/4 CW & 3/4 140°F HW THROUGH CODE REQUIRED BACKFLOW PREVENTERS AND CONNECT TO TILT SKILLET. ROUTE 1 1/4 G AND CONNECT TO TILT SKILLET.
29. ROUTE 3/4 CW THROUGH CODE REQUIRED BACKFLOW PREVENTER AND CONNECT TO STEAMER. ROUTE IW FROM STEAMER AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK. ROUTE 1 G AND CONNECT TO STEAMER.
30. 1 1/4 G TO CONVECTION OVEN.
31. 3/4 CW TO HOT PAN FILLING FAUCET.
32. 3/4 CW & 3/4 140°F HW TO UNDERGROUND TO SERVE KITCHEN EQUIPMENT. UNDERGROUND PIPING SHALL BE SOFT COPPER WITH NO JOINTS OR FITTINGS.
33. 3/4 CW TO UNDERGROUND TO SERVE KITCHEN EQUIPMENT. UNDERGROUND PIPING SHALL BE SOFT COPPER WITH NO JOINTS OR FITTINGS.
34. ROUTE PIPING HIGHER UP IN MEZZANINE AREA.
35. WORK INDICATED AS PART OF ALTERNATE#3.
36. ROUTE CONDENSATE/PUMPED CONDENSATE DRAIN AS INDICATED FROM ACU TO SERVICE SINK.
37. INSTALL DOWNSPOUT NOZZLE AT INDICATED ELEVATION ABOVE GRADE, ON EXTERIOR WALL.



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www.PeterBassoAssociates.com
PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE K

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

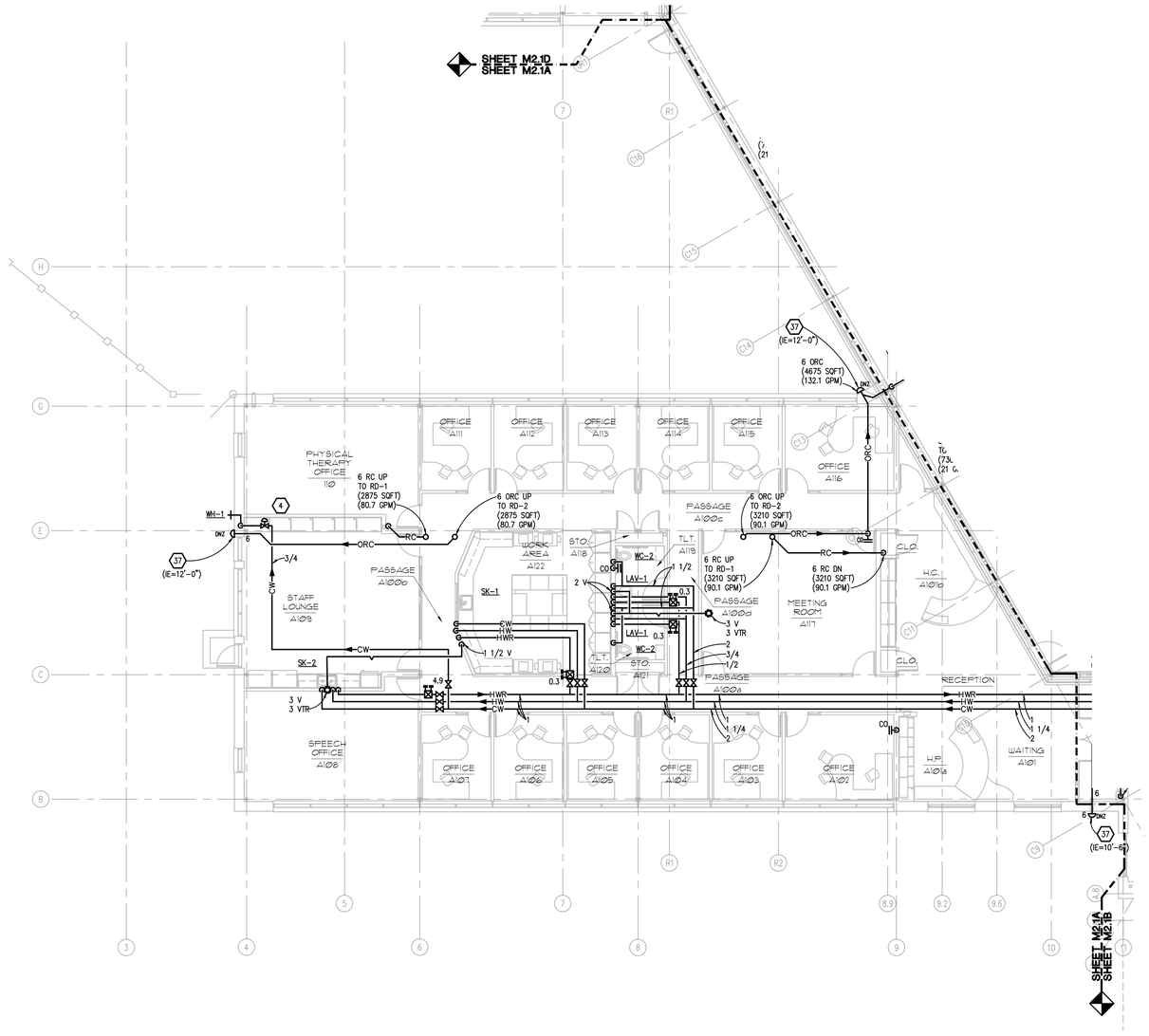
PROJECT NO.

19040

DRAWING NO.

M2.0K-BP3

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



PLUMBING PLAN - ZONE A

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

PLUMBING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
11. WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

(#) CONSTRUCTION KEY NOTES:

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2. ROUTE 1/2 CW, 1/2 140°F HW, 3 SAN & 1 1/2 V IN WALL. ROUTE 1/2 CW & 1/2 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW, HW, SAN & V TO HAND SINK/LAVATORY.
3. 4 DOMESTIC WATER RPZDA AND WATER METER. REFER TO DETAIL.
4. BMS CONTROLLED SOLENOID VALVE ON CW PIPE SERVING EXTERIOR POST HYDRANT/WALL HYDRANT/SITE DRINKING FOUNTAIN. AT LOATIONS SERVING POST HYDRANTS AND SITE DRINKING FOUNTAIN, PROVIDE COMPRESSED AIR QUICK CONNECT FITTING DOWNSTREAM OF MANUAL ISOLATION VALVE FOR BLOWOUT/WINTERIZATION.
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13. 3 SAN TO WMSD.
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22. ROUTE CW, HW AND HWR PIPING TO DWH-1 AND DWH-2. REFER TO BUILDING CONDENSING WATER HEATERS WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM.
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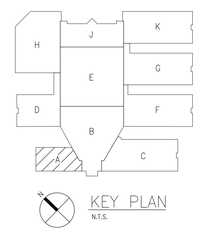
34. ROUTE PIPING HIGHER UP IN MEZZANINE AREA.
35. WORK INDICATED AS PART OF ALTERNATE#3.
36. ROUTE CONDENSATE/PUMPED CONDENSATE DRAIN AS INDICATED FROM ACU TO SERVICE SINK.
37. INSTALL DOWNSPOUT NOZZLE AT INDICATED ELEVATION ABOVE GRADE, ON EXTERIOR WALL.



KEY PLAN
N.T.S.

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

PLUMBING PLAN - ZONE A

ISSUE DATES

05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN KRD
CHECKED SVM
APPROVED RNR

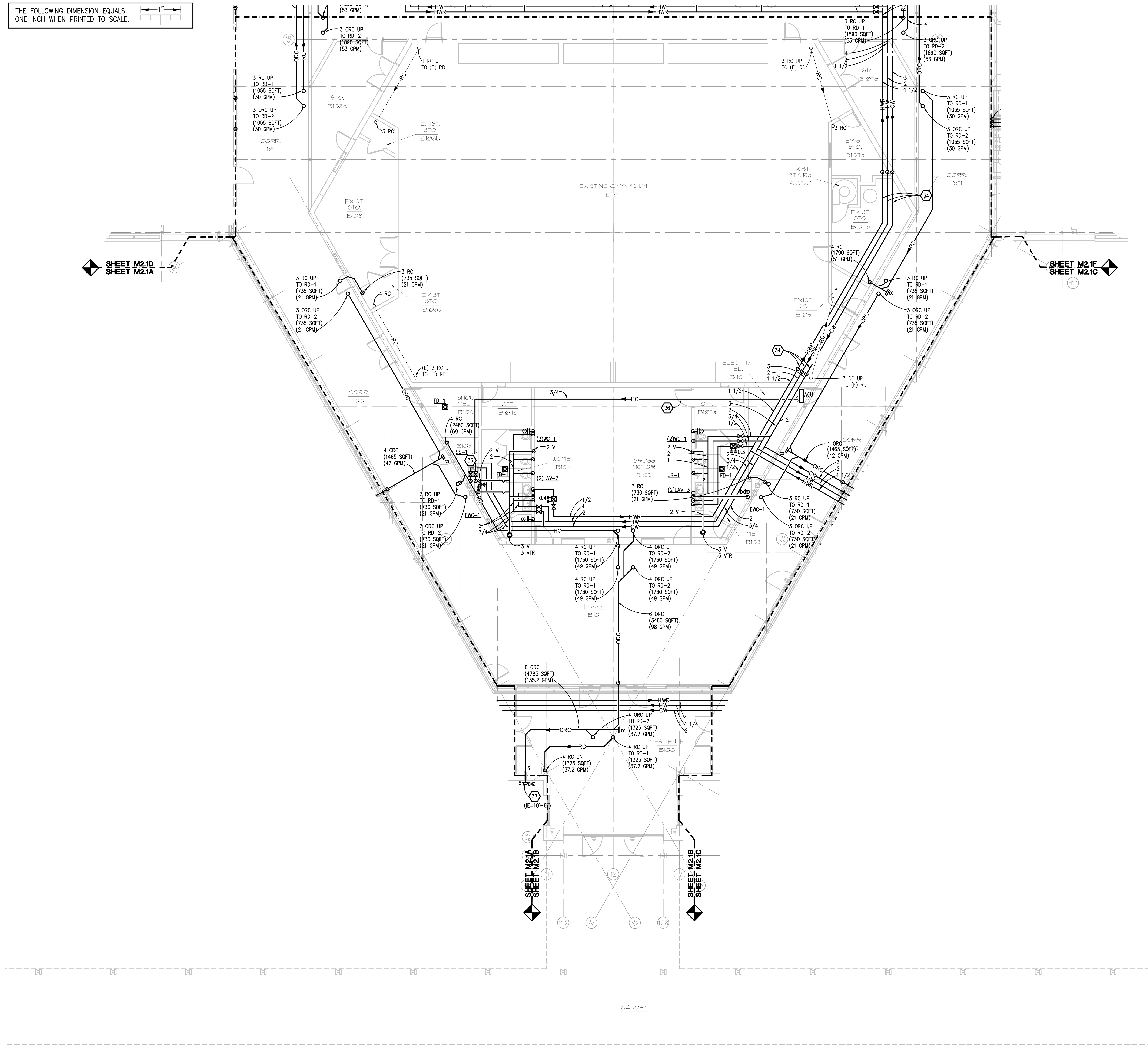
PROJECT NO.

19040

DRAWING NO.

M2.1A-BP3

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



PLUMBING PLAN - ZONE B

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

PLUMBING GENERAL NOTES:

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5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
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5. 3/4 CW MINIMUM 48 INCHES BELOW GRADE TO SERVE PAVILION POST HYDRANT. REFER TO SITE LOCATION ON DRAWING L1.
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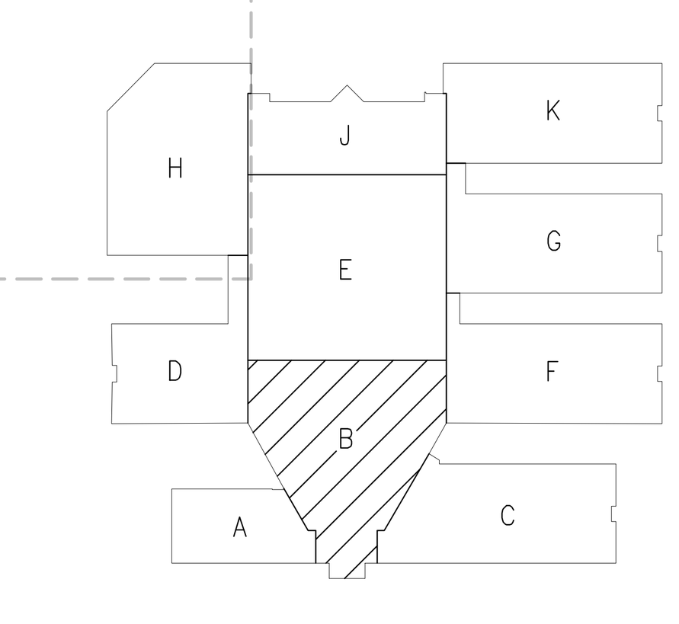

KEY PLAN

N.T.S.

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

PLUMBING PLAN - ZONE B

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN KRD

CHECKED SVM

APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M2.1B-BP3

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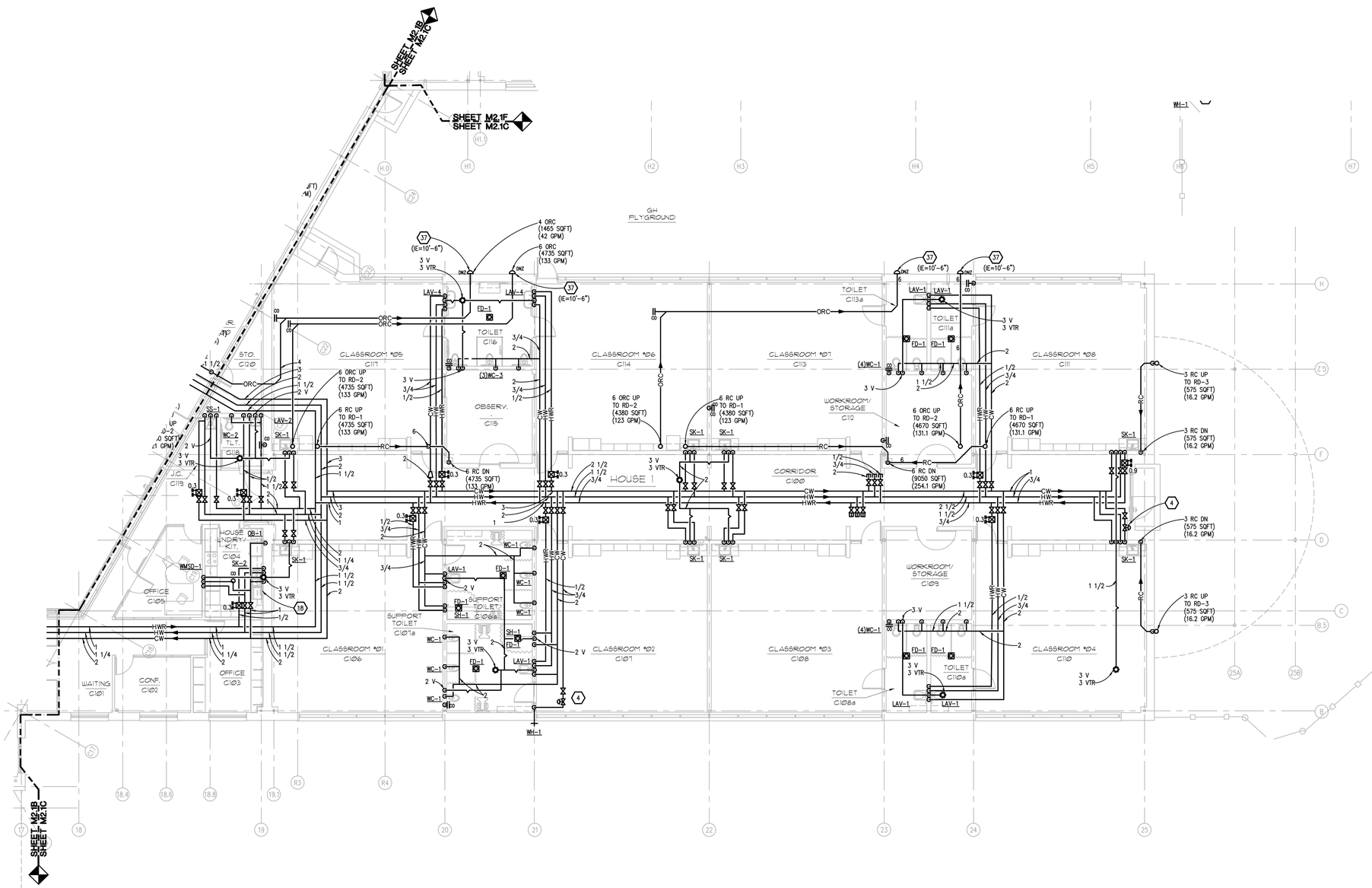

PLUMBING PLAN - ZONE C
SCALE: 1/8" = 1' - 0"

PLUMBING GENERAL NOTES:

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7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
11. WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

(#) CONSTRUCTION KEY NOTES:

1. CONNECT PSAN TO EXISTING SUMP PUMPS AND ROUTE AS INDICATED.
2. ROUTE 1/2 CW, 1/2 140°F HW, 3 SAN & 1 1/2 V IN WALL. ROUTE 1/2 CW & 1/2 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW, HW, SAN & V TO HAND SINK/LAVATORY.
3. 4 DOMESTIC WATER RPZDA AND WATER METER. REFER TO DETAIL.
4. BMS CONTROLLED SOLENOID VALVE ON CW PIPE SERVING EXTERIOR POST HYDRANT/WALL HYDRANT/SITE DRINKING FOUNTAIN. AT LOATIONS SERVING POST HYDRANTS AND SITE DRINKING FOUNTAIN, PROVIDE COMPRESSED AIR QUICK CONNECT FITTING DOWNSTREAM OF MANUAL ISOLATION VALVE FOR BLOWOUT/WINTERIZATION.
5. 3/4 CW MINIMUM 48 INCHES BELOW GRADE TO SERVE PAVILION POST HYDRANT. REFER TO SITE LOCATION ON DRAWING L1.
6. 2 AV FROM BULK CHEMICAL STORAGE TANK TO ATMOSPHERE. REFER TO POOL EQUIPMENT DRAWINGS.
7. ROUTE 3/4 CW & 3/4 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW & HW TO SINK. ROUTE IW FROM SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
8. 3 SAN TO LAV/SINK.
9. 4 SAN TO WC.
10. 3 SAN TO FLOOR DRAIN/SINK.
11. 3 SAN TO EWC.
12. 3 SAN TO UR.
13. 3 SAN TO WMSD.
14. 4 SAN TO FLOOR DRAIN/SINK.
15. 3 GSAN TO FLOOR DRAIN/SINK.
16. 3 GSAN TO SINK.
17. ALTERNATE NO. 5: REMOVE AND REPLACE EXISTING POOL DECK DRAIN STRAINER.
18. ROUTE 3/4 HW FROM SINK THROUGH AN ISOLATION VALVE AND CONNECT TO DISHWASHER. ROUTE WASTE FROM DISHWASHER AND CONNECT TO GARBAGE DISPOSAL ON SINK.
19. ROUTE 3/4 CW AND 3/4 HW FROM UNDERGROUND TO HAND SINK IN FLOOR ABOVE.
20. ROUTE 3/4 CW FROM UNDERGROUND TO FOOD COUNTER IN FLOOR ABOVE.
21. ROUTE SAN/ST PIPING TO WALL CLEANOUT MOUNTED 18" A.F.F. REFER TO FIRST FLOOR PLAN FOR DIRECTION OF CLEANOUT OPENING.
22. ROUTE CW, HW AND HWR PIPING TO DWH-1 AND DWH-2. REFER TO BUILDING CONDENSING WATER HEATERS WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM.
23. ROUTE CW, HW AND HWR PIPING TO DWH-3. REFER TO KITCHEN GAS FIRED WATER HEATER PIPING DIAGRAM.
24. INSTALL SHUT OFF VALVES IN CW AND HW BRANCH PIPING INDICATED.
25. ROUTE 3/4 CW & 3/4 140°F HW THROUGH CODE REQUIRED BACKFLOW PREVENTERS AND CONNECT TO DISHMACHINE. ROUTE IW FROM DISHMACHINE AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
26. ROUTE 3/4 CW & 3/4 140°F HW IN WALL AND CONNECT TO 3 COMPARTMENT SINK. ROUTE 3 GSAN & 1 1/2 V AND CONNECT TO WASH COMPARTMENT OF 3 COMPARTMENT SINK. ROUTE 3 IW FROM RINSE AND SANITIZE COMPARTMENTS OF 3 COMPARTMENT SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
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28. ROUTE 3/4 CW & 3/4 140°F HW THROUGH CODE REQUIRED BACKFLOW PREVENTERS AND CONNECT TO TILT SKILLET. ROUTE 1 1/4 G AND CONNECT TO TILT SKILLET.
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30. 1 1/4 G TO CONVECTION OVEN.
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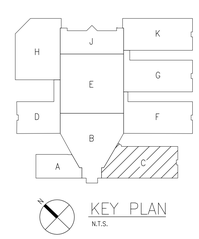
34. ROUTE PIPING HIGHER UP IN MEZZANINE AREA.
35. WORK INDICATED AS PART OF ALTERNATE#3.
36. ROUTE CONDENSATE/PUMPED CONDENSATE DRAIN AS INDICATED FROM ACU TO SERVICE SINK.
37. INSTALL DOWNSPOUT NOZZLE AT INDICATED ELEVATION ABOVE GRADE, ON EXTERIOR WALL.



KEY PLAN
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REGISTRATION SEAL

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Fax: 248-879-0007
www.PeterBassoAssociates.com
PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

PLUMBING PLAN - ZONE C

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

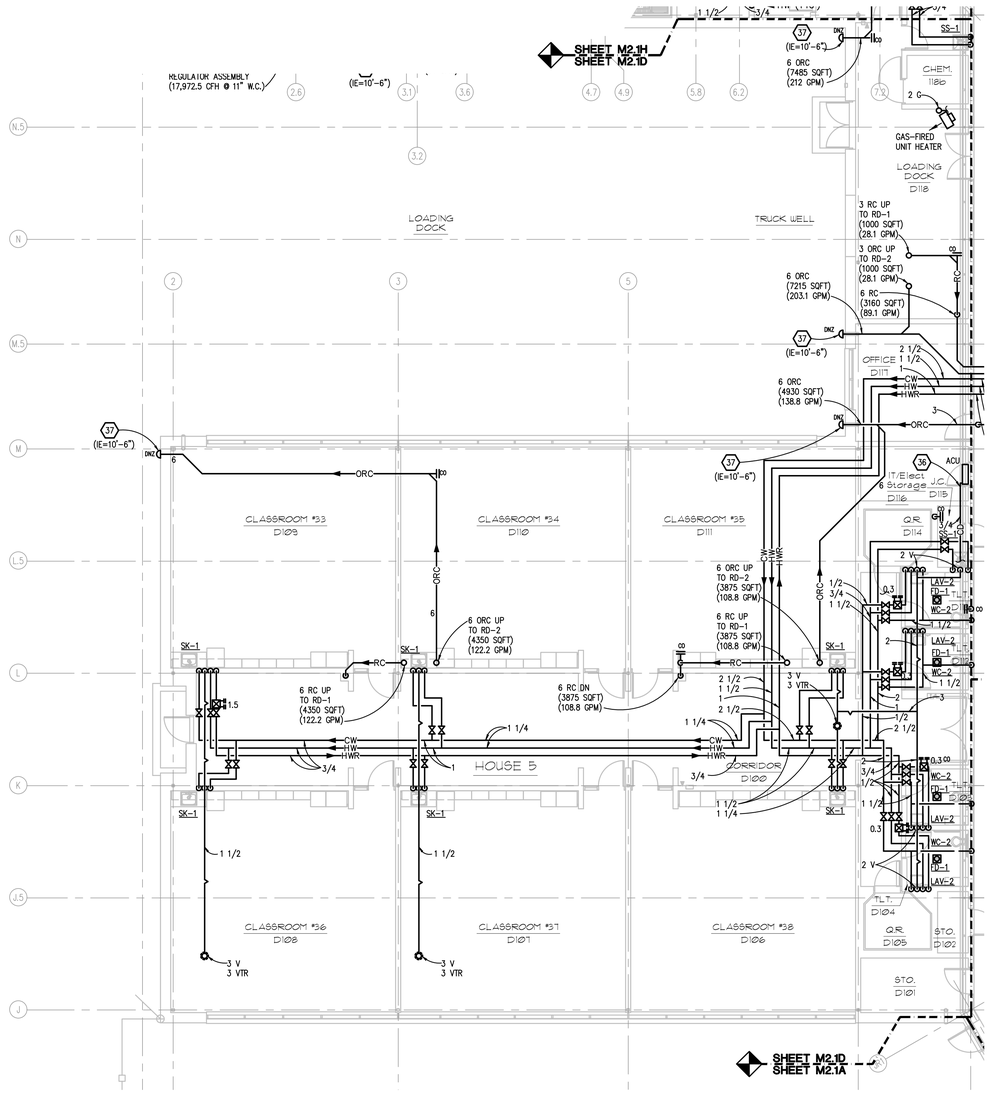
PROJECT NO.

19040

DRAWING NO.

M2.1C-BP3

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



PLUMBING PLAN - ZONE D
SCALE: 1/8" = 1' - 0"

PLUMBING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
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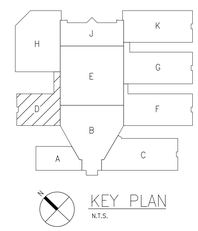

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

PLUMBING PLAN - ZONE D

ISSUE DATES

05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.
19040

DRAWING NO.
M2.1D-BP3

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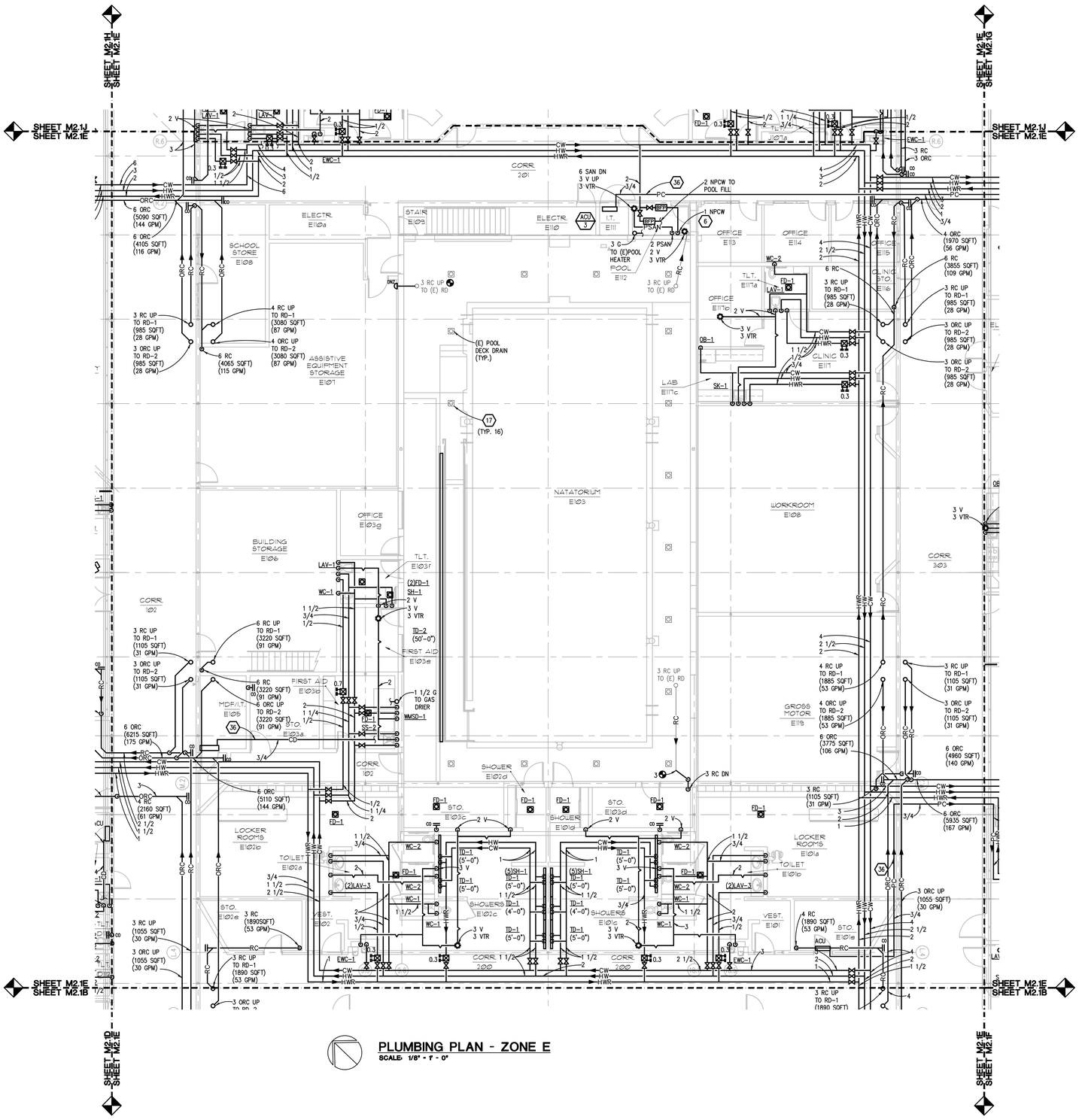

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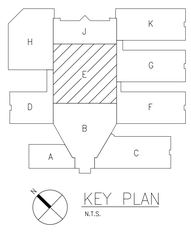
PLUMBING PLAN - ZONE E

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



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DRAWING TITLE

PLUMBING PLAN - ZONE E

ISSUE DATES

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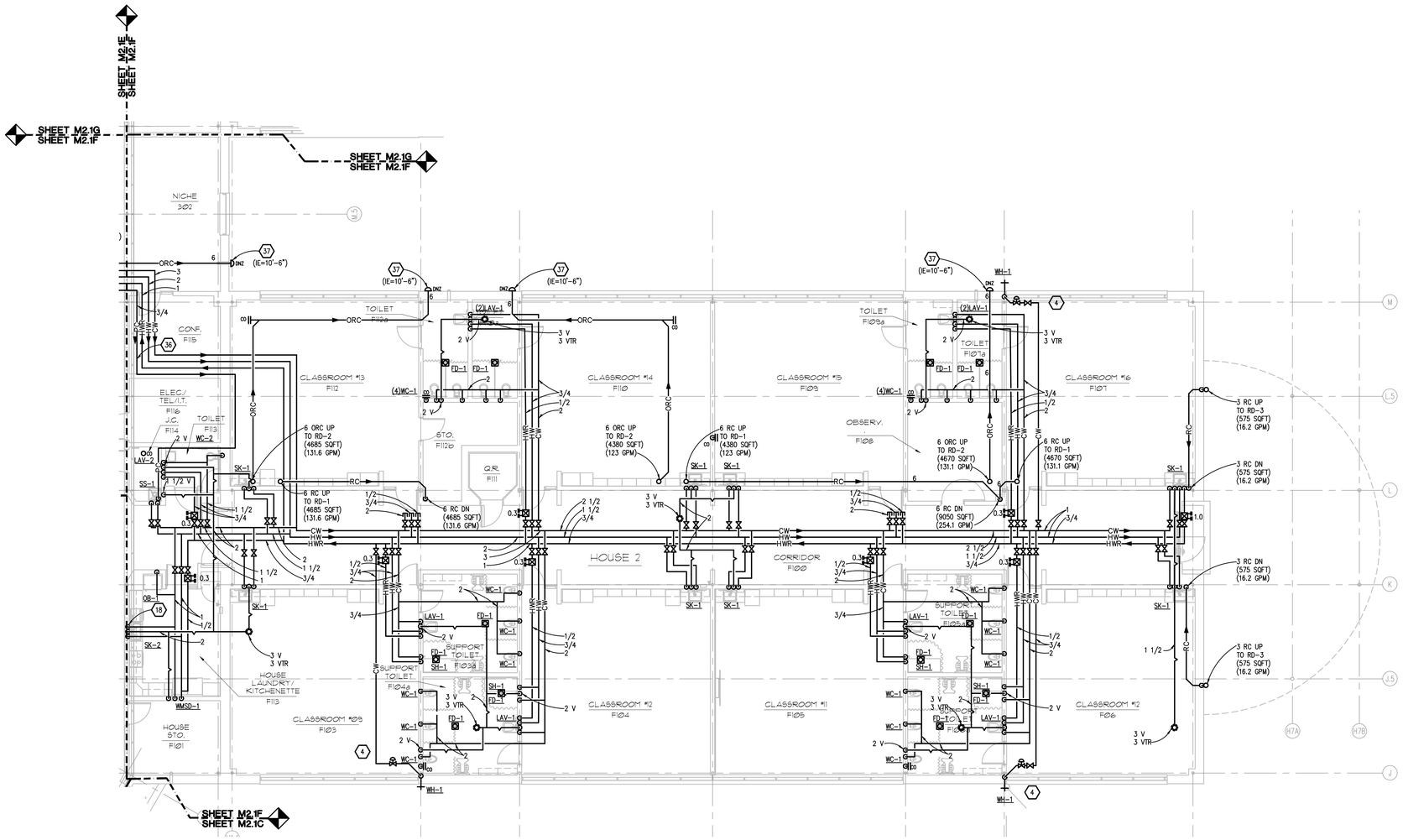

PLUMBING PLAN - ZONE F

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5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
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3. 4 DOMESTIC WATER RPZDA AND WATER METER. REFER TO DETAIL.
4. BMS CONTROLLED SOLENOID VALVE ON CW PIPE SERVING EXTERIOR POST HYDRANT/WALL HYDRANT/SITE DRINKING FOUNTAIN. AT LOATIONS SERVING POST HYDRANTS AND SITE DRINKING FOUNTAIN, PROVIDE COMPRESSED AIR QUICK CONNECT FITTING DOWNSTREAM OF MANUAL ISOLATION VALVE FOR BLOWOUT/WINTERIZATION.
5. 3/4 CW MINIMUM 48 INCHES BELOW GRADE TO SERVE PAVILION POST HYDRANT. REFER TO SITE LOCATION ON DRAWING L1.
6. 2 AV FROM BULK CHEMICAL STORAGE TANK TO ATMOSPHERE. REFER TO POOL EQUIPMENT DRAWINGS.
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22. ROUTE CW, HW AND HWR PIPING TO DWH-1 AND DWH-2. REFER TO BUILDING CONDENSING WATER HEATERS WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM.
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30. 1 1/4 G TO CONVECTION OVEN.
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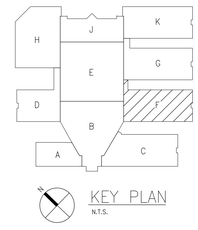

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PBA Project No.: 2019-0237

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New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
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DRAWING TITLE

PLUMBING PLAN - ZONE F

ISSUE DATES

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M2.1F-BP3

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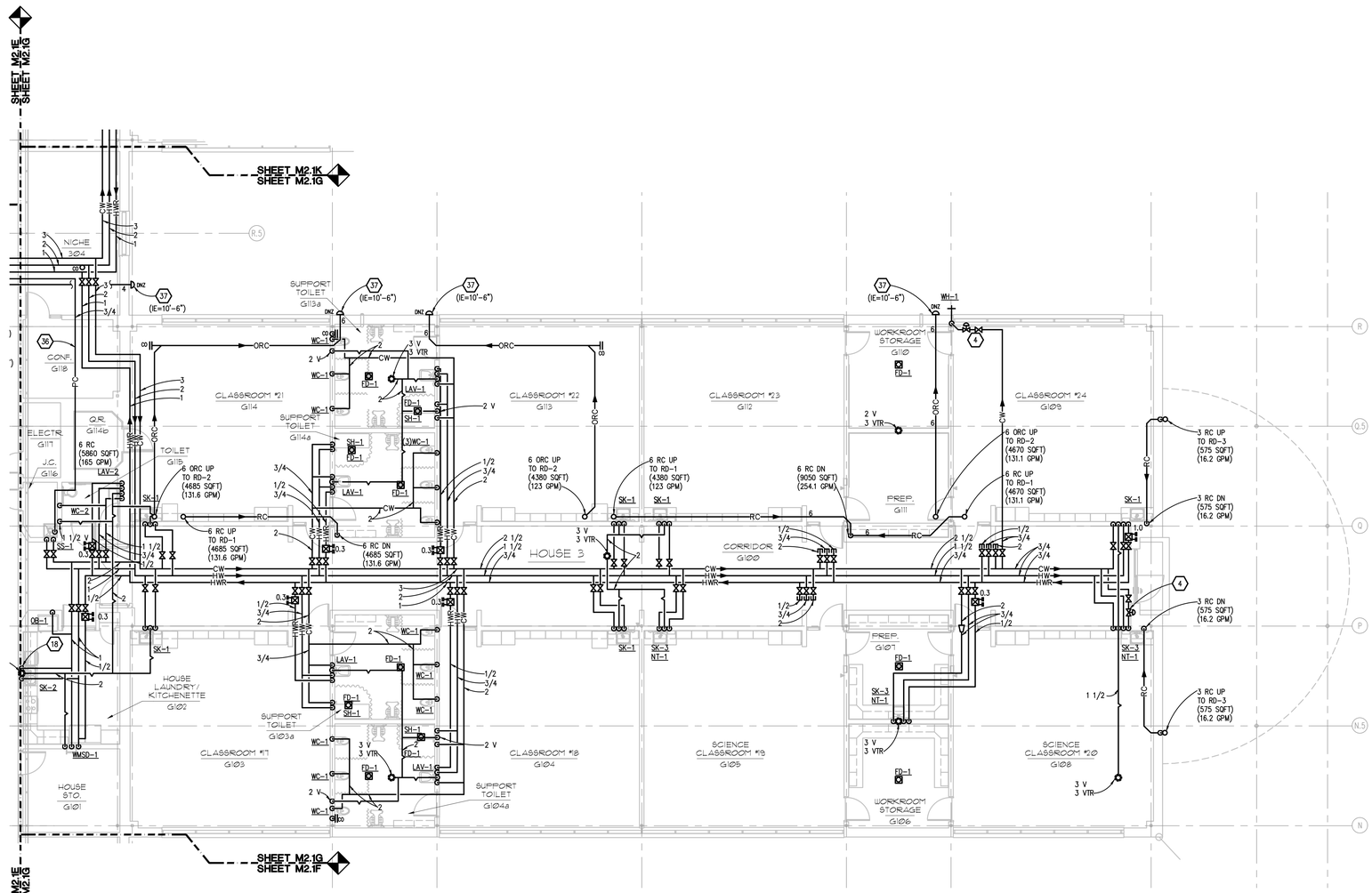

PLUMBING PLAN - ZONE G
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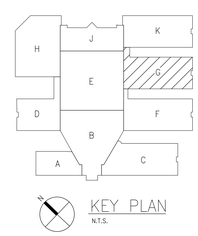

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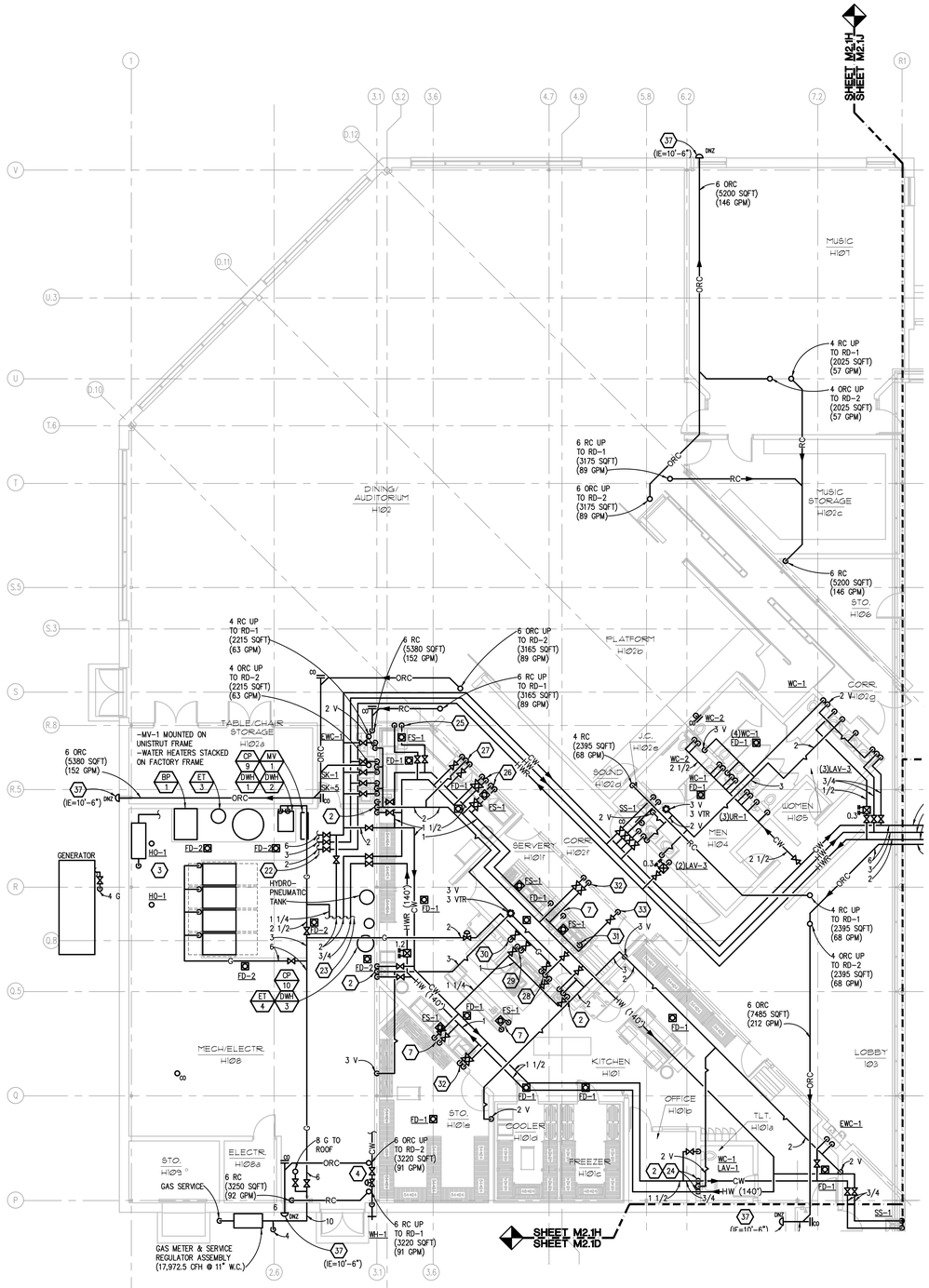

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PLUMBING PLAN - ZONE H

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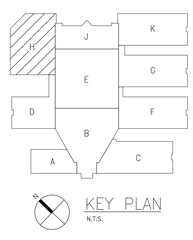

KEY PLAN
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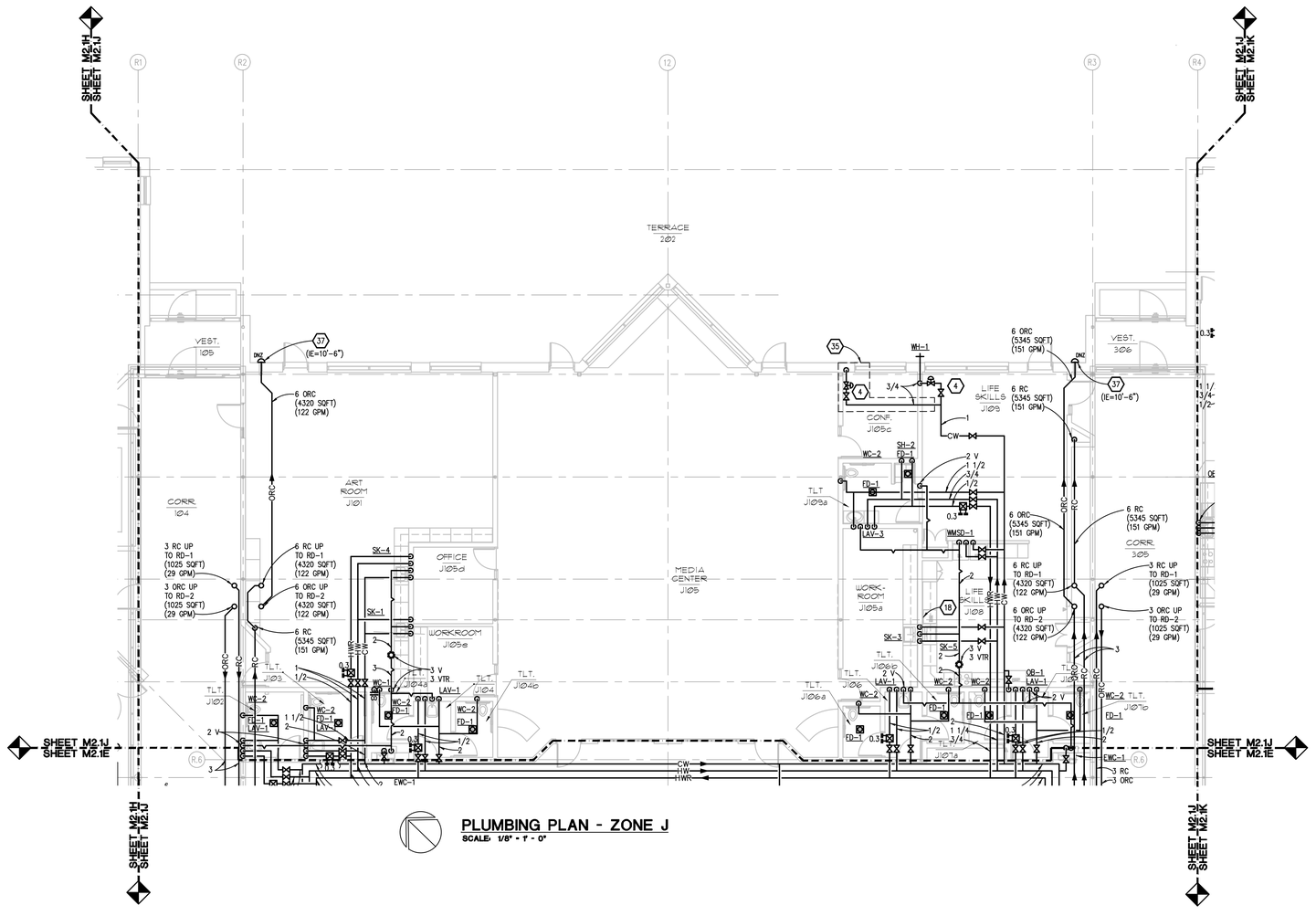
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



PLUMBING GENERAL NOTES:

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3. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
11. WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

(#) CONSTRUCTION KEY NOTES:

1. CONNECT PSAN TO EXISTING SUMP PUMPS AND ROUTE AS INDICATED.
2. ROUTE 1/2 CW, 1/2 140°F HW, 3 SAN & 1 1/2 V IN WALL. ROUTE 1/2 CW & 1/2 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW, HW, SAN & V TO HAND SINK/LAVATORY.
3. 4 DOMESTIC WATER RPZDA AND WATER METER. REFER TO DETAIL.
4. BMS CONTROLLED SOLENOID VALVE ON CW PIPE SERVING EXTERIOR POST HYDRANT/WALL HYDRANT/SITE DRINKING FOUNTAIN. AT LOATIONS SERVING POST HYDRANTS AND SITE DRINKING FOUNTAIN, PROVIDE COMPRESSED AIR QUICK CONNECT FITTING DOWNSTREAM OF MANUAL ISOLATION VALVE FOR BLOWOUT/WINTERIZATION.
5. 3/4 CW MINIMUM 48 INCHES BELOW GRADE TO SERVE PAVILION POST HYDRANT. REFER TO SITE LOCATION ON DRAWING L1.
6. 2 AV FROM BULK CHEMICAL STORAGE TANK TO ATMOSPHERE. REFER TO POOL EQUIPMENT DRAWINGS.
7. ROUTE 3/4 CW & 3/4 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW & HW TO SINK. ROUTE IW FROM SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
8. 3 SAN TO LAV/SINK.
9. 4 SAN TO WC.
10. 3 SAN TO FLOOR DRAIN/SINK.
11. 3 SAN TO EWC.
12. 3 SAN TO UR.
13. 3 SAN TO WMSD.
14. 4 SAN TO FLOOR DRAIN/SINK.
15. 3 GSAN TO FLOOR DRAIN/SINK.
16. 3 GSAN TO SINK.
17. ALTERNATE NO. 5: REMOVE AND REPLACE EXISTING POOL DECK DRAIN STRAINER.
18. ROUTE 3/4 HW FROM SINK THROUGH AN ISOLATION VALVE AND CONNECT TO DISHWASHER. ROUTE WASTE FROM DISHWASHER AND CONNECT TO GARBAGE DISPOSAL ON SINK.
19. ROUTE 3/4 CW AND 3/4 HW FROM UNDERGROUND TO HAND SINK IN FLOOR ABOVE.
20. ROUTE 3/4 CW FROM UNDERGROUND TO FOOD COUNTER IN FLOOR ABOVE.
21. ROUTE SAN/ST PIPING TO WALL CLEANOUT MOUNTED 18" A.F.F. REFER TO FIRST FLOOR PLAN FOR DIRECTION OF CLEANOUT OPENING.
22. ROUTE CW, HW AND HWR PIPING TO DWH-1 AND DWH-2. REFER TO BUILDING CONDENSING WATER HEATERS WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM.
23. ROUTE CW, HW AND HWR PIPING TO DWH-3. REFER TO KITCHEN GAS FIRED WATER HEATER PIPING DIAGRAM.
24. INSTALL SHUT OFF VALVES IN CW AND HW BRANCH PIPING INDICATED.
25. ROUTE 3/4 CW & 3/4 140°F HW THROUGH CODE REQUIRED BACKFLOW PREVENTERS AND CONNECT TO DISHMACHINE. ROUTE IW FROM DISHMACHINE AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
26. ROUTE 3/4 CW & 3/4 140°F HW IN WALL AND CONNECT TO 3 COMPARTMENT SINK. ROUTE 3 GSAN & 1 1/2 V AND CONNECT TO WASH COMPARTMENT OF 3 COMPARTMENT SINK. ROUTE 3 IW FROM RINSE AND SANITIZE COMPARTMENTS OF 3 COMPARTMENT SINK AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK.
27. ROUTE 3/4 CW, 3/4 140°F HW, 3 GSAN & 1 1/2 V IN WALL. ROUTE 3/4 CW & 3/4 140° HW THROUGH ASSE 1070 MIXING VALVE AND CONNECT CW, HW, GSAN & V TO PRE-SPRAY.
28. ROUTE 3/4 CW & 3/4 140°F HW THROUGH CODE REQUIRED BACKFLOW PREVENTERS AND CONNECT TO TILT SKILLET. ROUTE 1 1/4 G AND CONNECT TO TILT SKILLET.
29. ROUTE 3/4 CW THROUGH CODE REQUIRED BACKFLOW PREVENTER AND CONNECT TO STEAMER. ROUTE IW FROM STEAMER AND TERMINATE AT CODE REQUIRED DISTANCE ABOVE FLOOR SINK. ROUTE 1 G AND CONNECT TO STEAMER.
30. 1 1/4 G TO CONVECTION OVEN.
31. 3/4 CW TO HOT PAN FILLING FAUCET.
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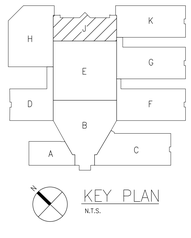
34. ROUTE PIPING HIGHER UP IN MEZZANINE AREA.
35. WORK INDICATED AS PART OF ALTERNATE#3.
36. ROUTE CONDENSATE/PUMPED CONDENSATE DRAIN AS INDICATED FROM ACU TO SERVICE SINK.
37. INSTALL DOWNSPOUT NOZZLE AT INDICATED ELEVATION ABOVE GRADE, ON EXTERIOR WALL.

PLUMBING PLAN - ZONE J

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



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www.PeterBassoAssociates.com
PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

PLUMBING PLAN - ZONE J

ISSUE DATES

05-27-2020	FOR CONSTRUCTION – BID PACK #3
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08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

PROJECT NO.

19040

DRAWING NO.

M2.1J-BP3

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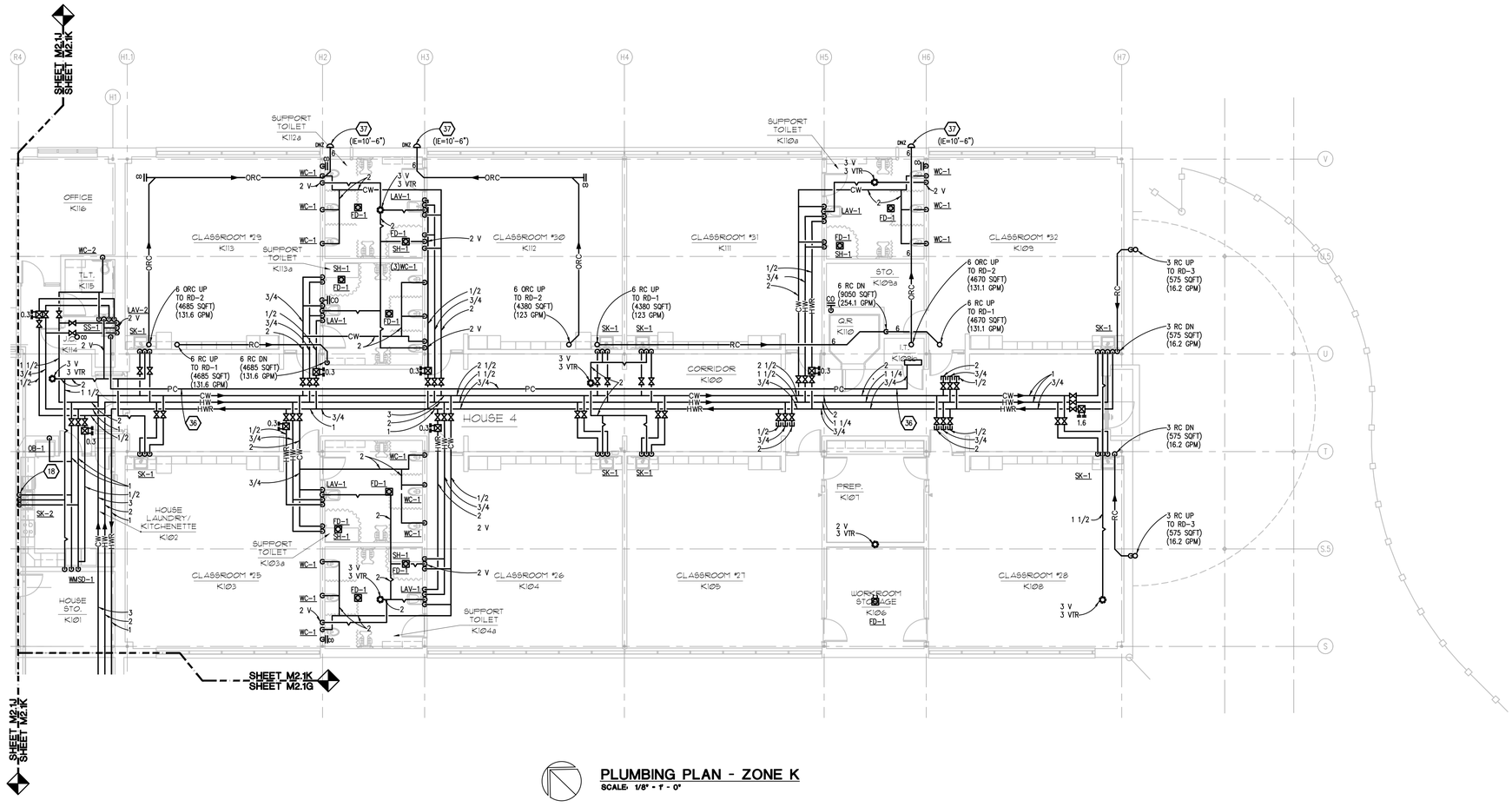

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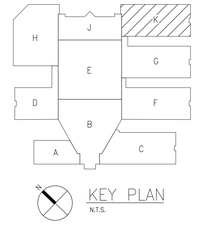

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PBA Project No.: 2019-0237

PROJECT TITLE

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DRAWING TITLE

PLUMBING PLAN - ZONE K

ISSUE DATES

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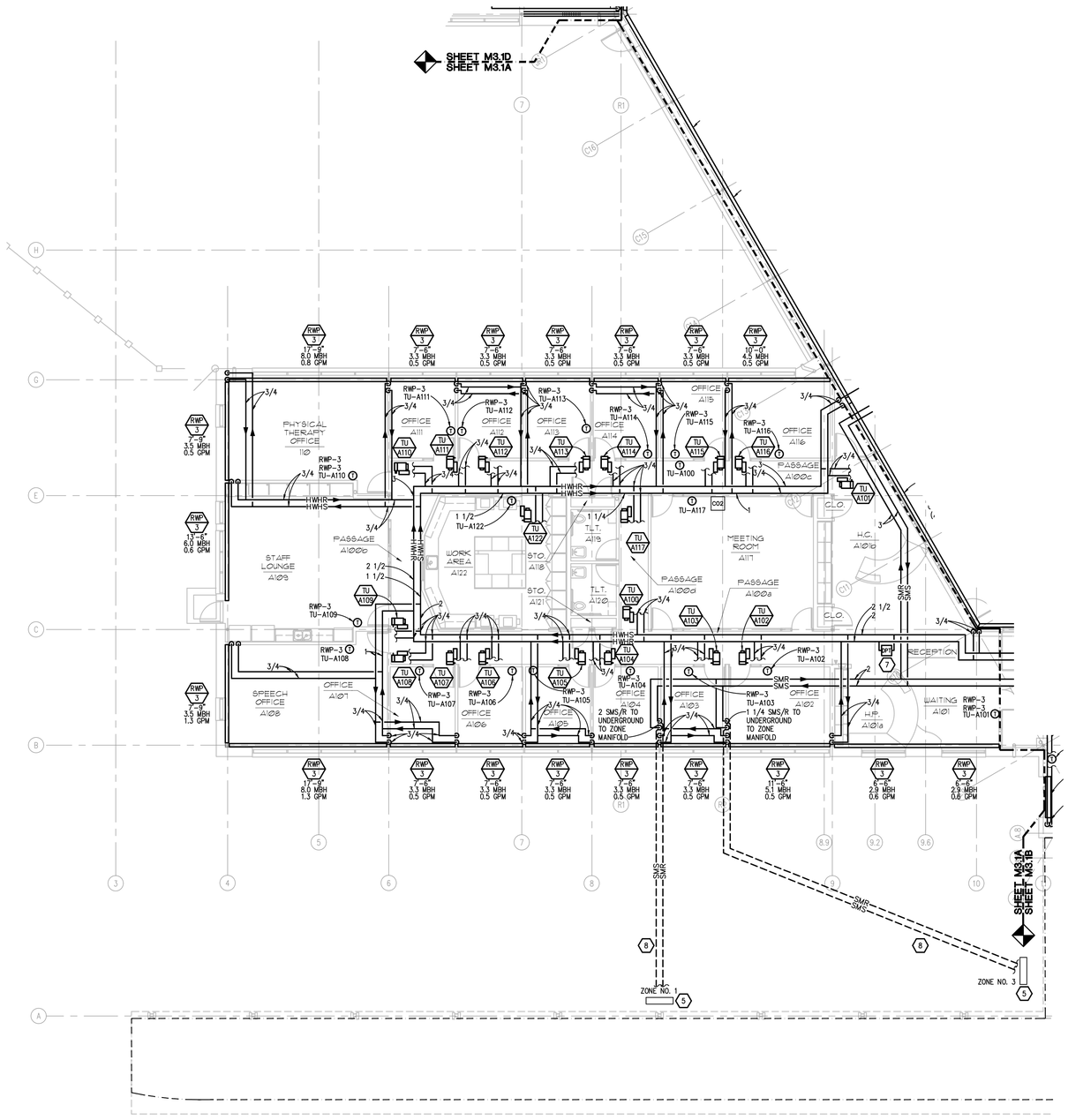

HVAC PIPING PLAN - ZONE A

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

HVAC PIPING GENERAL NOTES:

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3. PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
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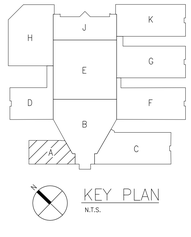
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.
7. COORDINATE LOCATION OF DUCT-MOUNTED HYDRONIC DEVICES WITH SHEET METAL TRADES.
8. BRANCH PIPING SERVING TERMINAL UNIT HEATING COILS OR RADIANT CEILING PANELS SHALL BE 3/4" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING MORE THAN ONE TERMINAL UNIT HEATING COIL SHALL BE 1" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING HOT WATER UNIT HEATERS AND CABINET UNIT HEATERS SHALL BE 1" UNLESS OTHERWISE NOTED.
9. MOUNT THERMOSTATS 48" A.F.F., UNLESS OTHERWISE NOTED. LOCATE AS CLOSE AS POSSIBLE TO DOOR WHEN INDICATED NEAR DOOR. COORDINATE EXACT LOCATION WITH ALL OTHER TRADES.

(#) CONSTRUCTION KEY NOTES:

1. REFER TO UH PIPING DIAGRAM(S) FOR ADDITIONAL REQUIREMENTS.
2. REFER TO CUH PIPING DIAGRAM(S) FOR ADDITIONAL REQUIREMENTS
3. REFER TO HOUSE 4 (ZONE K) FOR TYPICAL CLASSROOM WING HOT WATER HEATING PIPING AND EQUIPMENT LAYOUT.
4. PACKAGED SNOWMELT SKID SYSTEM.
5. SNOW MELT SYSTEM MANIFOLD IN GROUND BOX.
6. PROVIDE WITH END TRIM TO MEET THE LENGTH AS INDICATED ON PLANS. TYPICAL OF ALL RADIANT HEATING EQUIPMENT.
7. PROVIDE DIFFERENTIAL PRESSURE TRANSMITTER REFER TO DETAIL.
8. PROVIDE PVC CARRIER PIPE FOR INSULATED SMS/SMR PIPING. SEAL ENDS WATER TIGHT TO PREVENT WATER INFILTRATION.
9. PROVIDE PIPING ENCLOSURE AS INDICATED. COLOR TO MATCH CABINET UNIT HEATER HOUSE COLOR.
10. 2 1/2 HWHS/R TO SNOW MELT SYSTEM.
11. PROVIDE 5'-0" x 4'-0" EXPANSION LOOP.
12. PROVIDE 5'-0" x 10'-0" EXPANSION LOOP.



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PROJECT TITLE

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DRAWING TITLE

HVAC PIPING PLAN - ZONE A

ISSUE DATES

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M3.1A-BP3

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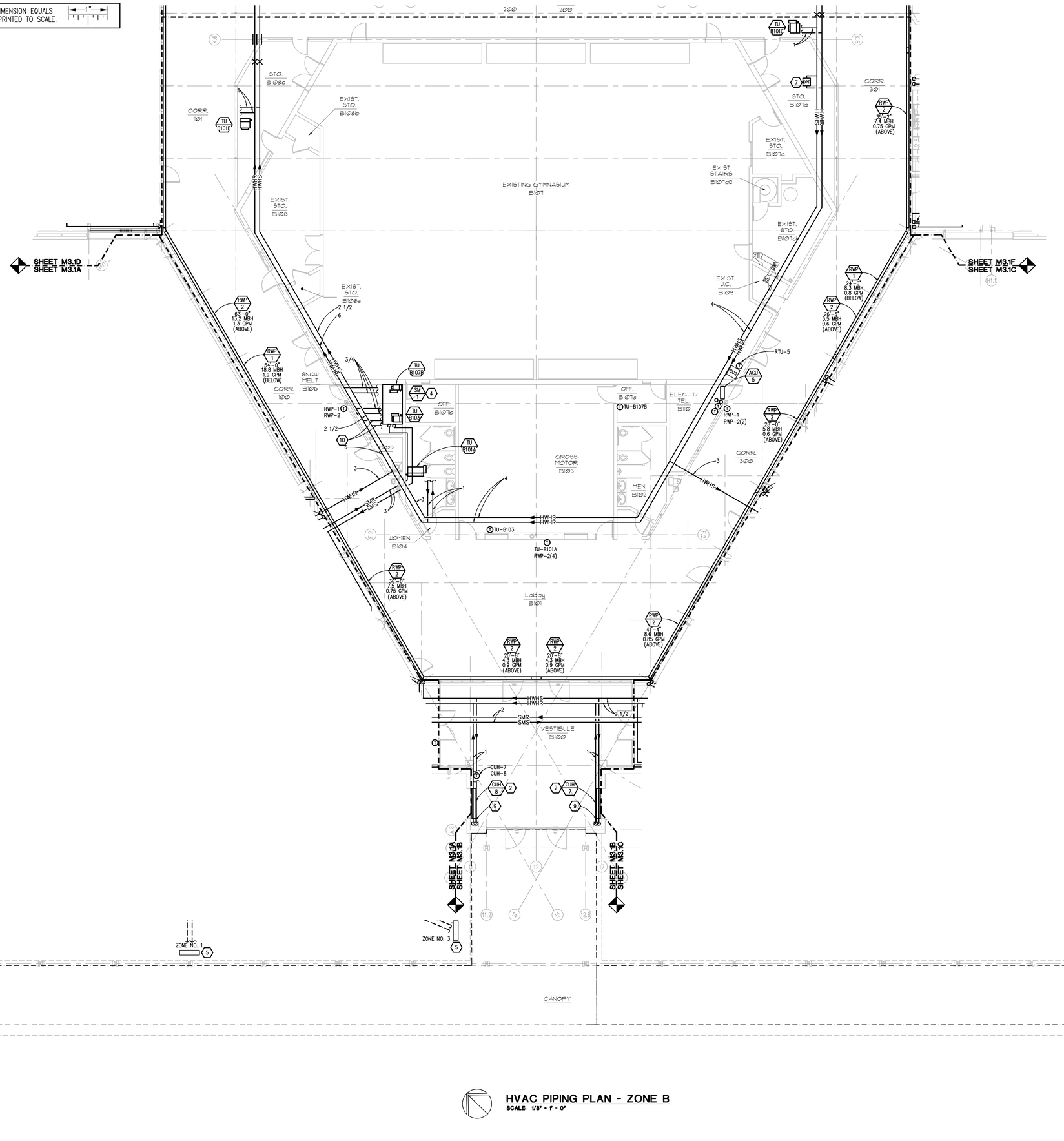

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7. PROVIDE DIFFERENTIAL PRESSURE TRANSMITTER REFER TO DETAIL.
8. PROVIDE PVC CARRIER PIPE FOR INSULATED SMS/SMR PIPING. SEAL ENDS WATER TIGHT TO PREVENT WATER INFILTRATION.
9. PROVIDE PIPING ENCLOSURE AS INDICATED. COLOR TO MATCH CABINET UNIT HEATER HOUSE COLOR.
10. 2 1/2 HWHS/R TO SNOW MELT SYSTEM.
11. PROVIDE 5'-0" x 4'-0" EXPANSION LOOP.
12. PROVIDE 5'-0" x 10'-0" EXPANSION LOOP.

HVAC PIPING PLAN - ZONE B

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

KEY PLAN N.T.S.

TMP ARCHITECTURE
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EM• INFO@TMP-ARCHITECTURE.COM
Mitchell and Mouat architects

REGISTRATION SEAL

CONSULTANT

Peter Basso Associates Inc
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5145 Livernois, Suite 100
Troy, Michigan 48098-3276
Tel: 248-879-5666
Fax: 248-879-0007
www.PeterBassoAssociates.com
PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

HVAC PIPING PLAN - ZONE B

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	JRM
CHECKED	SVM
APPROVED	RNR

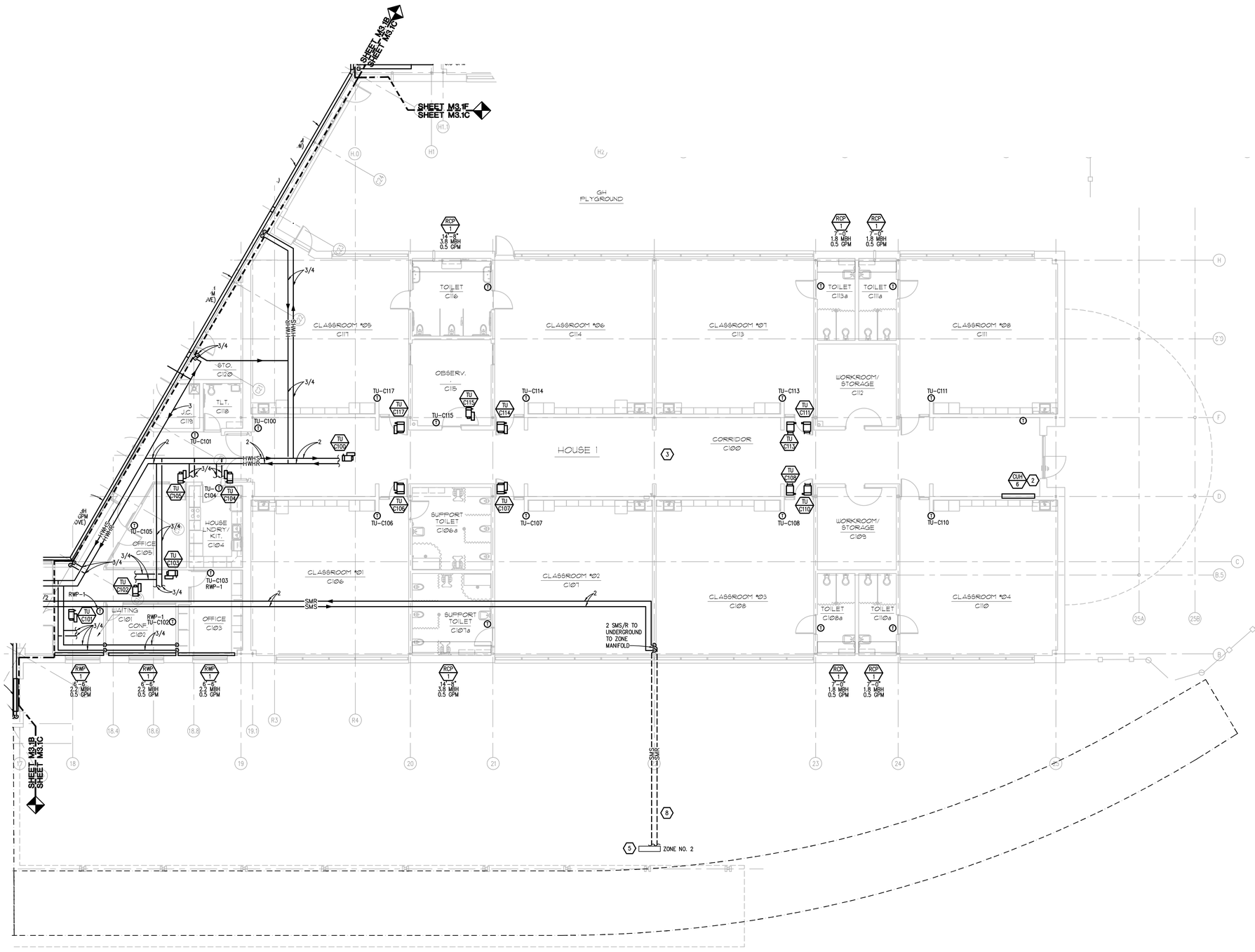
PROJECT NO.

19040

DRAWING NO.

M3.1B-BP3

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



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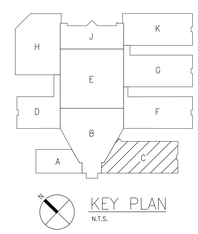
HVAC PIPING PLAN - ZONE C

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



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PBA Project No.: 2019-0237

PROJECT TITLE

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1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

HVAC PIPING PLAN - ZONE C

ISSUE DATES

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DRAWN JRM
CHECKED SVM
APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M3.1C-BP3

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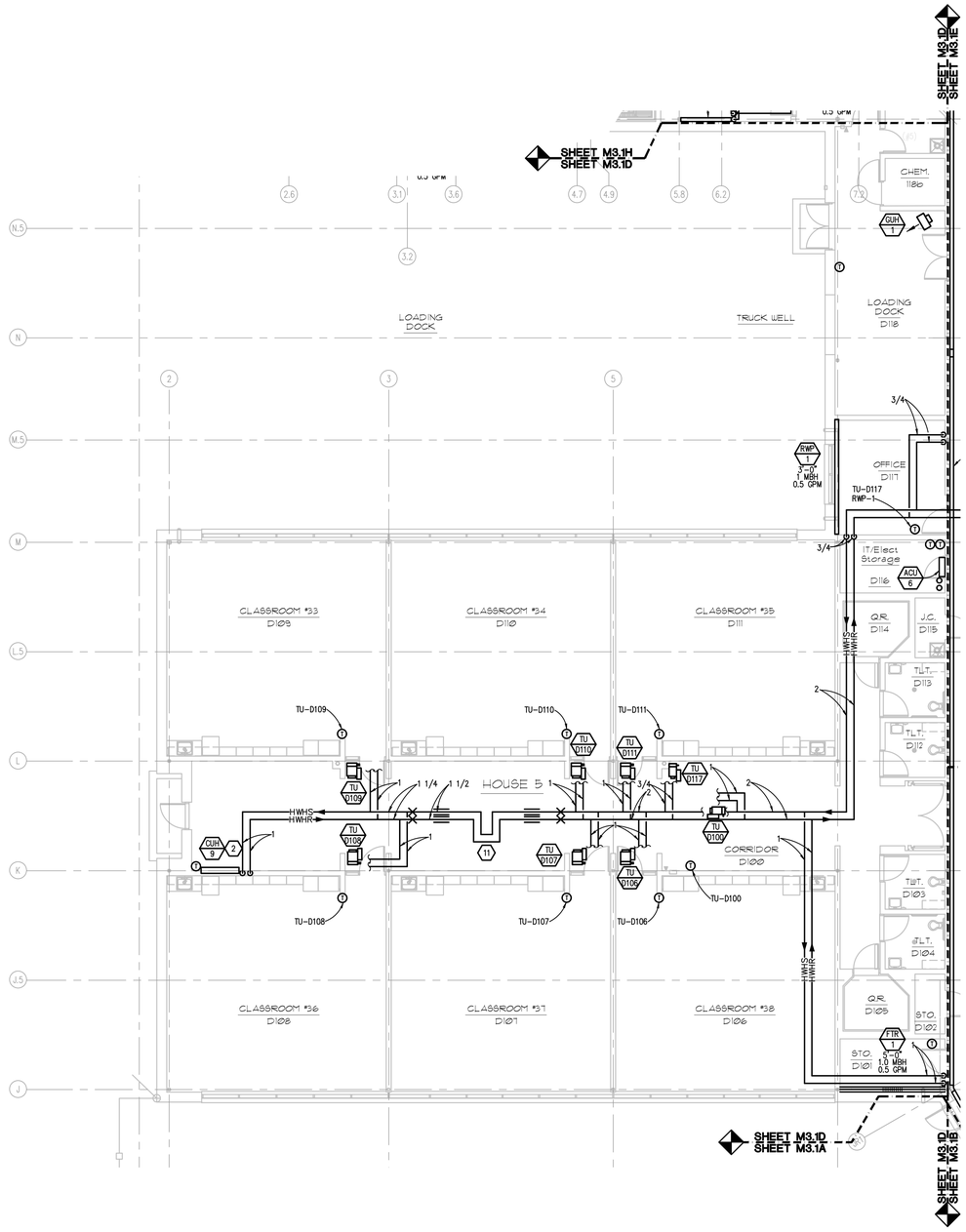

HVAC PIPING PLAN - ZONE D
SCALE: 1/8" = 1' - 0"

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

HVAC PIPING PLAN - ZONE D

ISSUE DATES

DATE:	ISSUED FOR:
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05-01-2020	95% REVIEW - BP3
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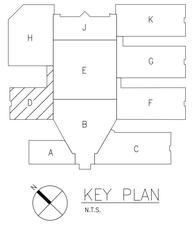
08-12-2019	SCHEMATIC DESIGN

DRAWN	JRM
CHECKED	SVM
APPROVED	RNR

PROJECT NO.
19040

DRAWING NO.
M3.1D-BP3



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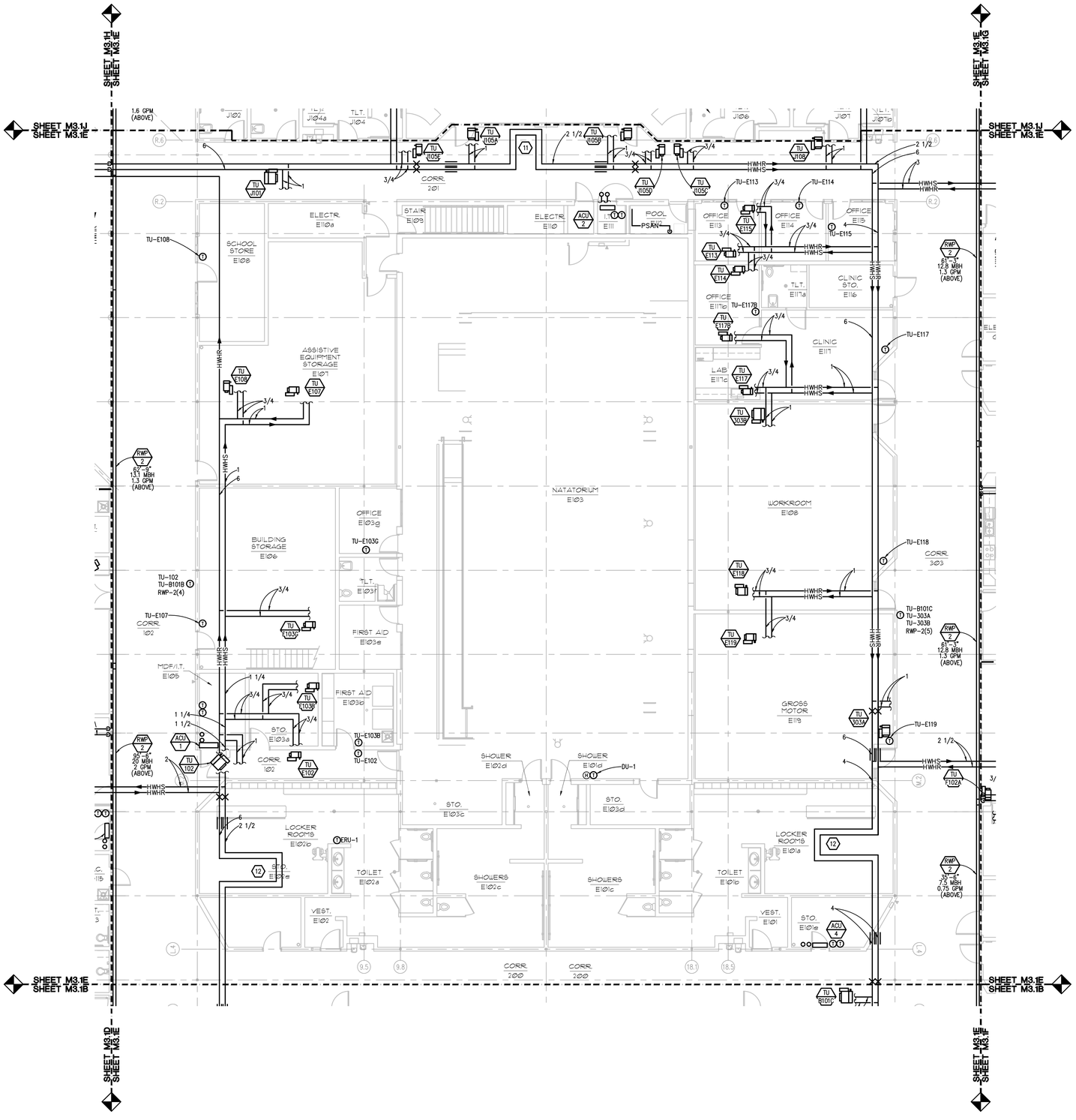

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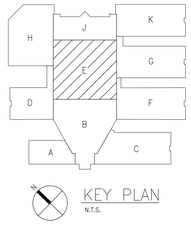
HVAC PIPING PLAN - ZONE E

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



KEY PLAN
N.T.S.

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

HVAC PIPING PLAN - ZONE E

ISSUE DATES

05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN	JRM
CHECKED	SVM
APPROVED	RNR

PROJECT NO.

19040

DRAWING NO.

M3.1E-BP3

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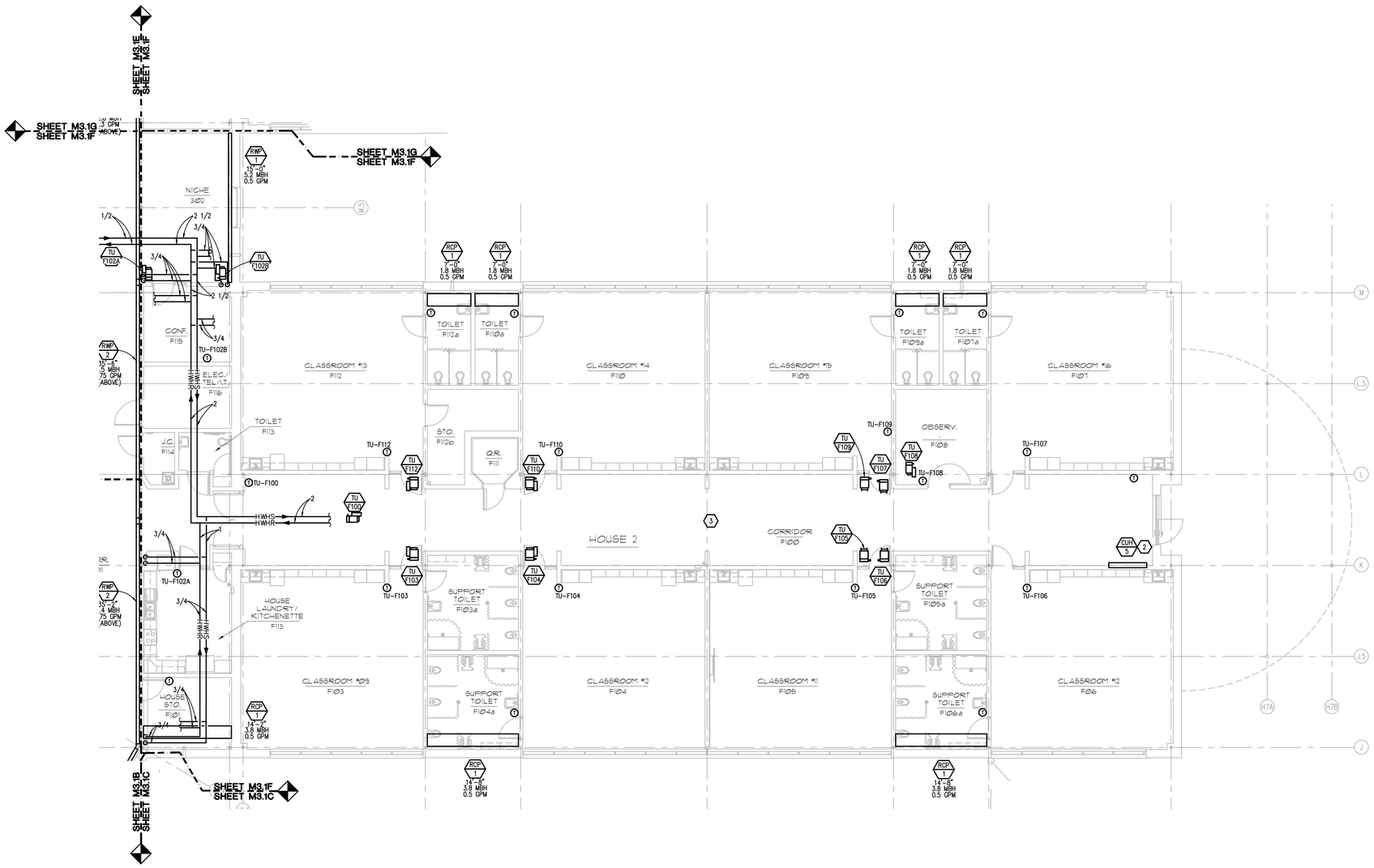

HVAC PIPING PLAN - ZONE F

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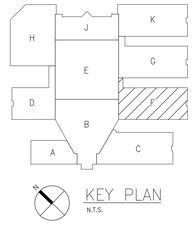

KEY PLAN
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PROJECT TITLE

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DRAWING TITLE

HVAC PIPING PLAN - ZONE F

ISSUE DATES

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DRAWN	JRM
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M3.1F-BP3

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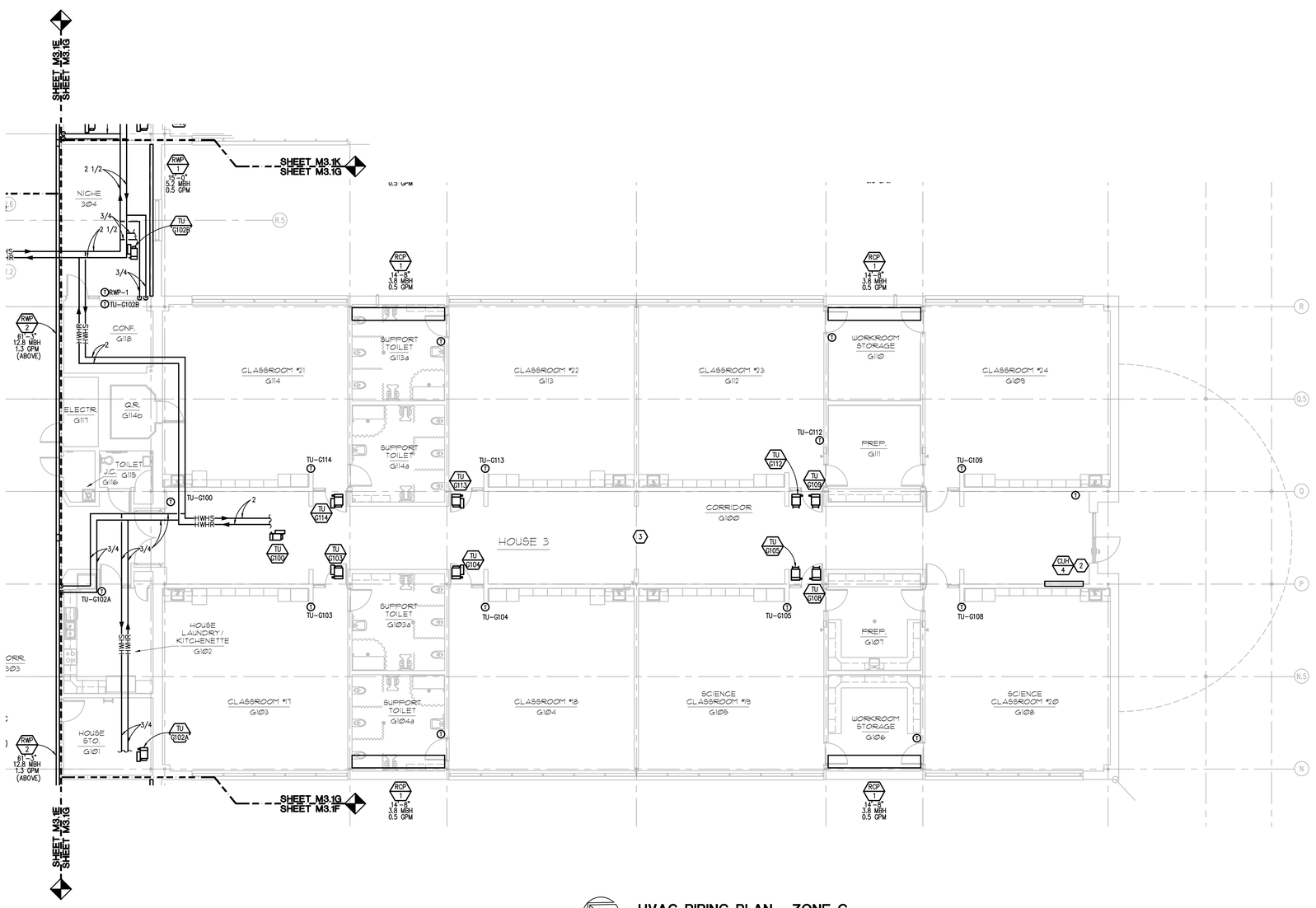

HVAC PIPING PLAN - ZONE G

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6. PROVIDE WITH END TRIM TO MEET THE LENGTH AS INDICATED ON PLANS. TYPICAL OF ALL RADIANT HEATING EQUIPMENT.
7. PROVIDE DIFFERENTIAL PRESSURE TRANSMITTER REFER TO DETAIL.
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11. PROVIDE 5'-0" x 4'-0" EXPANSION LOOP.
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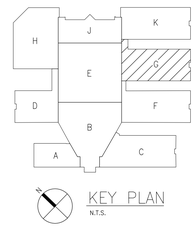

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www.PeterBassoAssociates.com
PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

HVAC PIPING PLAN - ZONE G

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	JRM
CHECKED	SVM
APPROVED	RNR

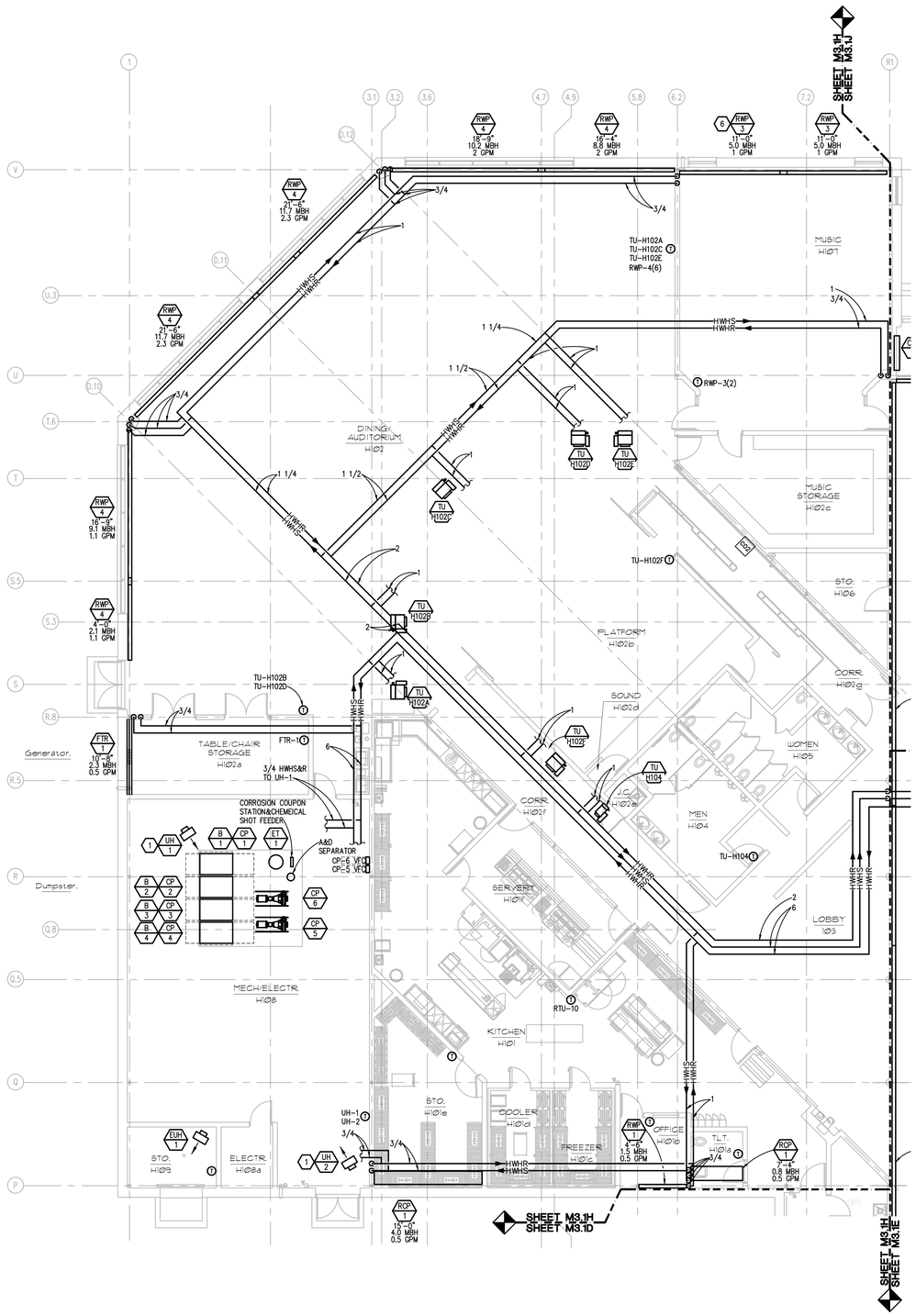
PROJECT NO.

19040

DRAWING NO.

M3.1G-BP3

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



HVAC PIPING PLAN - ZONE H

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

HVAC PIPING GENERAL NOTES:

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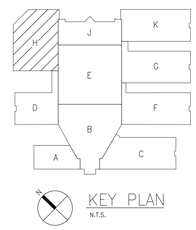

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DRAWING TITLE

HVAC PIPING PLAN - ZONE H

ISSUE DATES

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M3.1H-BP3

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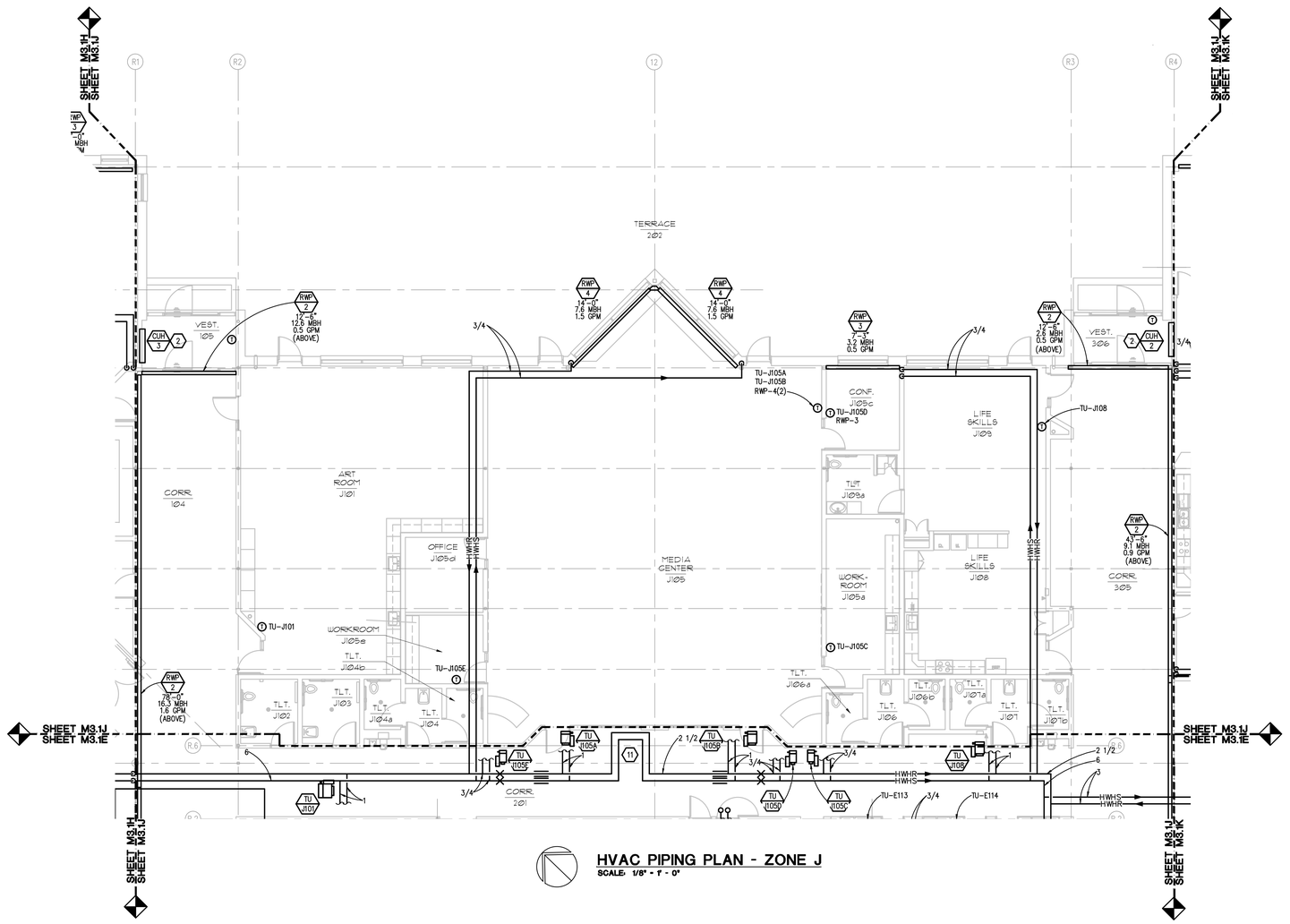

HVAC PIPING PLAN - ZONE J

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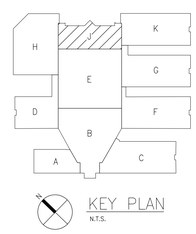

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DRAWING TITLE

HVAC PIPING PLAN - ZONE J

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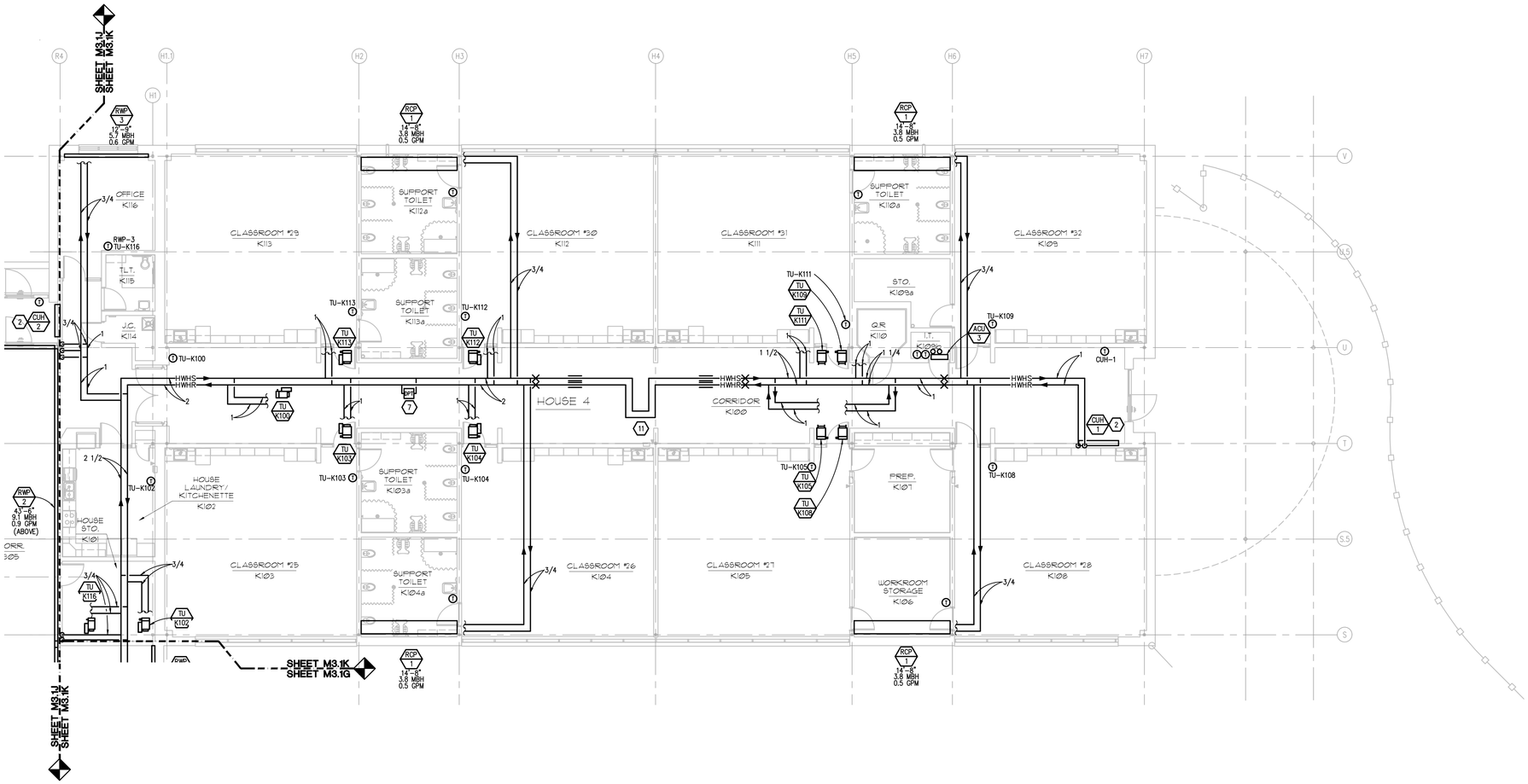

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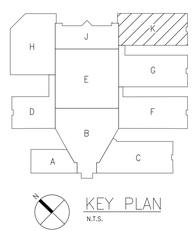

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PROJECT TITLE

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DRAWING TITLE

HVAC PIPING PLAN - ZONE K

ISSUE DATES

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DRAWN JRM
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PROJECT NO.

19040

DRAWING NO.

M3.1K-BP3

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

SHEET METAL PLAN - ZONE A

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

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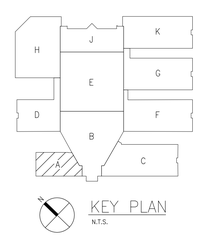
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.

CONSTRUCTION KEY NOTES:

1. PROVIDE REMOTE CABLE BALANCING SYSTEM FOR VOLUME DAMPERS ABOVE HARD CEILING. LOCATE CONTROLS ABOVE LAY-IN/EXPOSED CEILING ADJACENT TO ROOM
2. FIRST TERMINAL UNIT TO BE AT LEAST 15 FEET AWAY FROM RTU FOR FUTURE INLINE HUMIDIFICATION UNIT. THIS 15 FEET OF DUCT SHALL BE STAINLESS STEEL.
3. BALANCE VOLUME DAMPER TO CFM INDICATED.
4. REFER TO CLASSROOM K112 FOR TYPICAL CLASSROOM DUCTWORK LAYOUT (TYP.).
5. PROVIDE 56"x48" HEAVY DUTY RETURN GRILLE 8" ABOVE FINISHED FLOOR. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
6. PROVIDE 48"x72" LOW ALUMINUM EXTERIOR LOUVER. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
7. PROVIDE RETURN AIR TRANSFER DUCTWORK. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
8. PROVIDE 76"x16" ARCHITECTURAL LOUVER. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
9. PROVIDE 32"x24" LOW HEAVY DUTY RETURN GRILLE. REFER TO HEAVY DUTY RETURN AIR GRILLE DETAIL FOR ADDITIONAL REQUIREMENTS.
10. PROVIDE 72"x64" LOW HEAVY DUTY RETURN GRILLE. REFER TO HEAVY DUTY RETURN AIR GRILLE DETAILS FOR ADDITIONAL REQUIREMENTS.
11. REFER TO CLASSROOM K109 FOR TYPICAL CLASSROOM DUCTWORK LAYOUT (TYP.).
12. REFER TO CORRIDOR K100 FOR TYPICAL CORRIDOR DUCTWORK LAYOUT (TYP.).
13. REFER TO EF-2 IN K112A AND K113A FOR TYPICAL EXHAUST DUCTWORK LAYOUT (TYP.).
14. REFER TO CLASSROOM K108 FOR TYPICAL DUCTWORK LAYOUT (TYP.).
15. REFER TO D109 FOR TYPICAL DUCTWORK LAYOUT (TYP.).
16. REFER TO M5.1B FOR DUCTWORK CONTINUATION.
17. ROUTE DUCTWORK THROUGH WEBBING OF JOIST.
18. ROUTE 12x12 PVC COATED EXHAUST DUCTWORK DOWN AND TERMINATE 12 INCHES ABOVE FINISHED FLOOR.
19. PROVIDE RANGE HOOD GE JVW5301SJSS OR ARCHITECTURAL APPROVED EQUAL. ROUTE EXHAUST DUCTWORK UP THROUGH ROOF AND TERMINATE WITH GOOSE NECK AND BIRDSCREEN.
20. PROVIDE DRYER BOOSTER FAN FANTECH DBF4XL OR APPROVED EQUAL WITH SERVICE TRAP NEW PORT. ROUTE EXHAUST DUCTWORK UP THROUGH ROOF WITH GOOSE NECK TERMINATION. WITH BIRDSCREEN.
21. PROVIDE 2 HOUR MAX DIGITAL TIMER FOR ROOM EXHAUST.
22. REFER TO MEZZANINE PLAN FOR DUCTWORK CONTINUATION.
23. PROVIDE CONCRETE CURB AT FLOOR PENETRATION.
24. 10ø STACK WITH 5ø DISCHARGE CONE.. REFER TO ROOF EXHAUST FAN AND STACK DETAIL FOR ADDITIONAL REQUIREMENTS.
25. PROVIDE ROOF CURB AT DUCTWORK ROOF PENETRATIONS.
26. PROVIDE ROOF MOUNTED DUCT/PIPE SUPPORT (TYP.).
27. PROVIDE PIPING PORTAL AT PIPING ROOF PENETRATIONS (TYP.).
28. ALL EXPOSED DUCTWORK TO BE DOUBLE WALLED CONSTRUCTION.
29. INSULATE TRANSFER DUCT SAME AS SUPPLY DUCT THROUGH VESTIBULE.
30. INSTALL TRANSFER GRILLE AND DUCTWORK HIGH ON WALL.
31. PROVIDE ACCESS PANEL IN HARD CEILING FOR EXHAUST FAN/DAMPER.
32. PROVIDE CURB ADAPTOR FOR NEW EXHAUST FAN.
33. PROVIDE CEILING ACCESS PANEL.
34. ROUTE 8ø DRYER EXHAUST DUCT UP THROUGH ROOF. TERMINATE DUCT WITH GOOSENECK AND BIRD SCREEN. PROVIDE ROOF CURB AT ROOF PENETRATION.



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SHEET METAL PLAN - ZONE A

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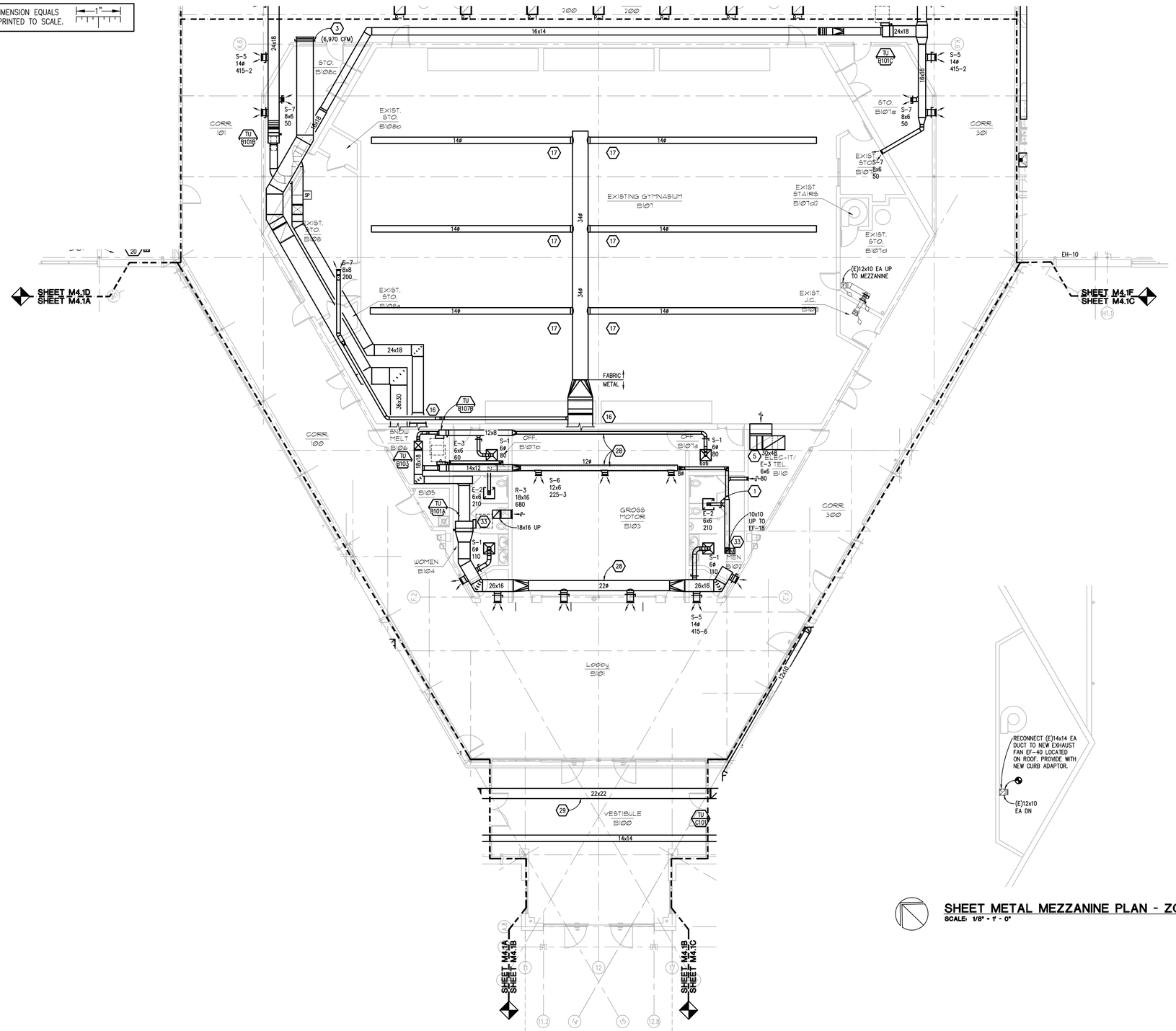

SHEET METAL MEZZANINE PLAN - ZONE B

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

SHEET METAL PLAN - ZONE B

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SHEET METAL GENERAL NOTES:

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4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.

(#) CONSTRUCTION KEY NOTES:

1. PROVIDE REMOTE CABLE BALANCING SYSTEM FOR VOLUME DAMPERS ABOVE HARD CEILING. LOCATE CONTROLS ABOVE LAY-IN/EXPOSED CEILING ADJACENT TO ROOM
2. FIRST TERMINAL UNIT TO BE AT LEAST 15 FEET AWAY FROM RTU FOR FUTURE INLINE HUMIDIFICATION UNIT. THIS 15 FEET OF DUCT SHALL BE STAINLESS STEEL.
3. BALANCE VOLUME DAMPER TO CFM INDICATED.
4. REFER TO CLASSROOM K112 FOR TYPICAL CLASSROOM DUCTWORK LAYOUT (TYP.).
5. PROVIDE 56"x48" HEAVY DUTY RETURN GRILLE 8" ABOVE FINISHED FLOOR. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
6. PROVIDE 48"x72" LOW ALUMINUM EXTERIOR LOUVER. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
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16. REFER TO M5.1B FOR DUCTWORK CONTINUATION.
17. ROUTE DUCTWORK THROUGH WEBBING OF JOIST.
18. ROUTE 12x12 PVC COATED EXHAUST DUCTWORK DOWN AND TERMINATE 12 INCHES ABOVE FINISHED FLOOR.
19. PROVIDE RANGE HOOD GE JVW5301SJSS OR ARCHITECTURAL APPROVED EQUAL. ROUTE EXHAUST DUCTWORK UP THROUGH ROOF AND TERMINATE WITH GOOSE NECK AND BIRDSCREEN.
20. PROVIDE DRYER BOOSTER FAN FANTECH DBF4XL OR APPROVED EQUAL WITH SERVICE TRAP VIEW PORT. ROUTE EXHAUST DUCTWORK UP THROUGH ROOF WITH GOOSE NECK TERMINATION. WITH BIRDSCREEN.
21. PROVIDE 2 HOUR MAX DIGITAL TIMER FOR ROOM EXHAUST.
22. REFER TO MEZZANINE PLAN FOR DUCTWORK CONTINUATION.
23. PROVIDE CONCRETE CURB AT FLOOR PENETRATION.
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25. PROVIDE ROOF CURB AT DUCTWORK ROOF PENETRATIONS.
26. PROVIDE ROOF MOUNTED DUCT/PIPE SUPPORT (TYP.).
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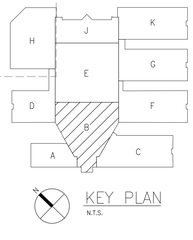
30. INSTALL TRANSFER GRILLE AND DUCTWORK HIGH ON WALL.
31. PROVIDE ACCESS PANEL IN HARD CEILING FOR EXHAUST FAN/DAMPER.
32. PROVIDE CURB ADAPTOR FOR NEW EXHAUST FAN.
33. PROVIDE CEILING ACCESS PANEL.
34. ROUTE @@ DRYER EXHAUST DUCT UP THROUGH ROOF. TERMINATE DUCT WITH GOOSENECK AND BIRD SCREEN. PROVIDE ROOF CURB AT ROOF PENETRATION.



KEY PLAN
N.T.S.

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REGISTRATION SEAL

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www.PeterBassoAssociates.com
PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

SHEET METAL PLAN - ZONE B

ISSUE DATES

05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN JRM
CHECKED SVM
APPROVED RNR

PROJECT NO.
19040

DRAWING NO.
M4.1B-BP3

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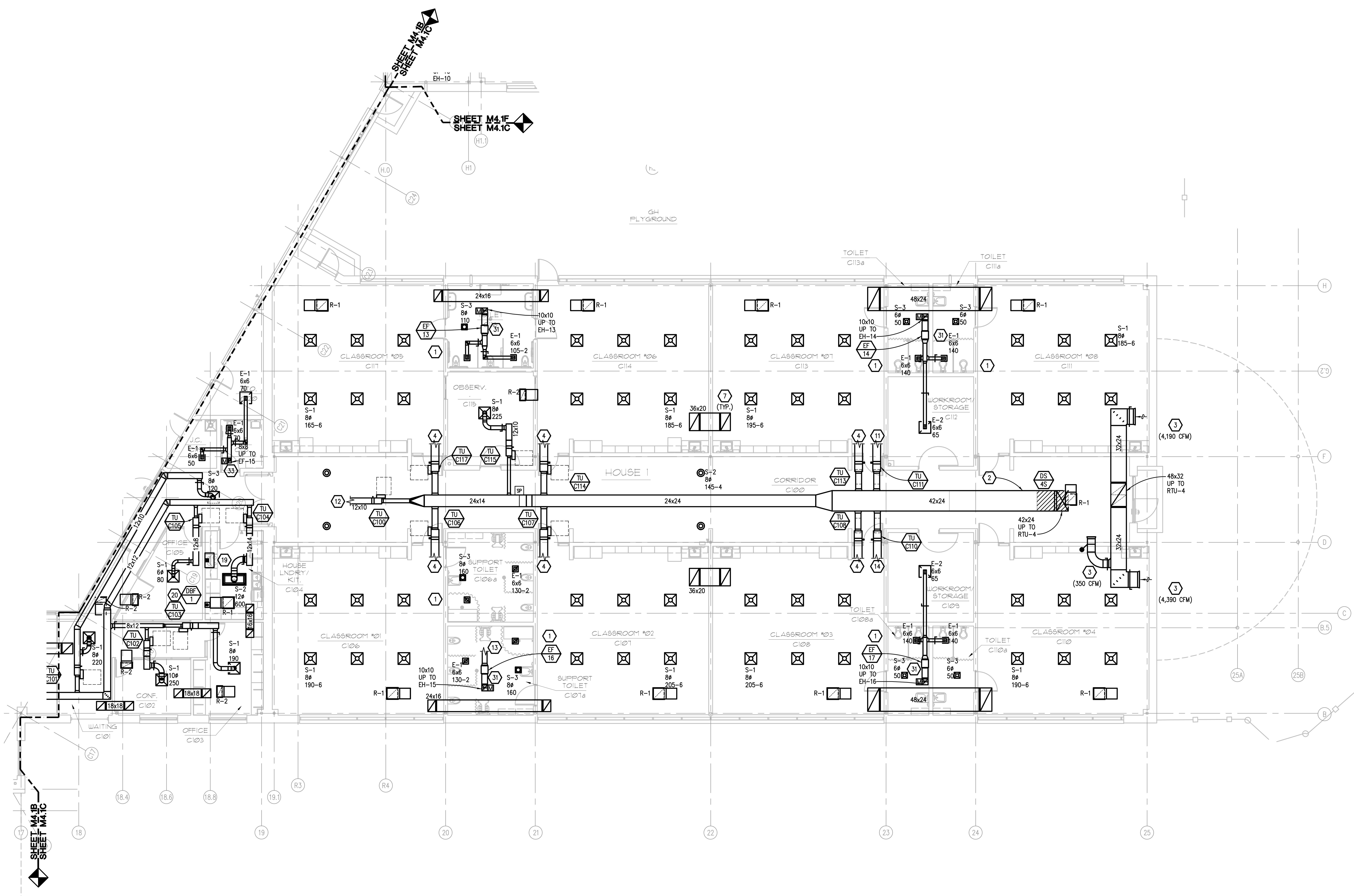

SHEET METAL PLAN - ZONE C
SCALE: 1/8" = 1' - 0"

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PROJECT TITLE

New High Point School
Washtenaw Intermediate School District

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Ann Arbor, Michigan

DRAWING TITLE

SHEET METAL PLAN - ZONE C

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
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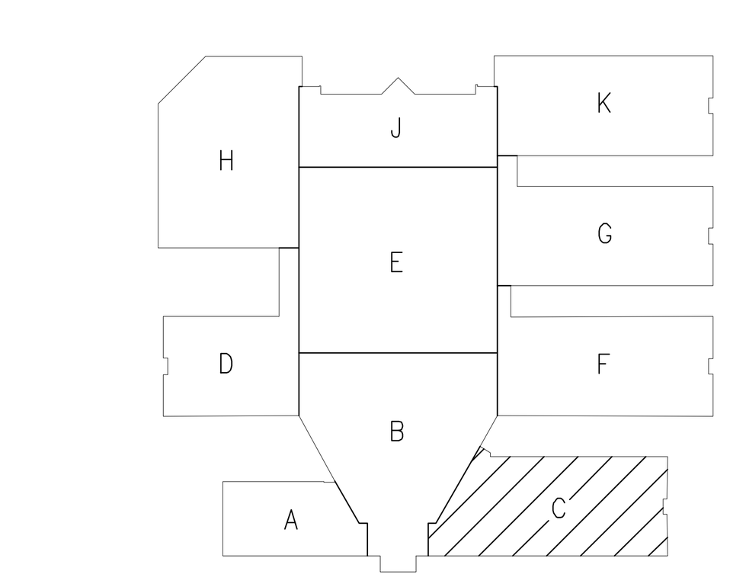

KEY PLAN
N.T.S.

PROJECT NO.

19040

DRAWING NO.

M4.1C-BP3

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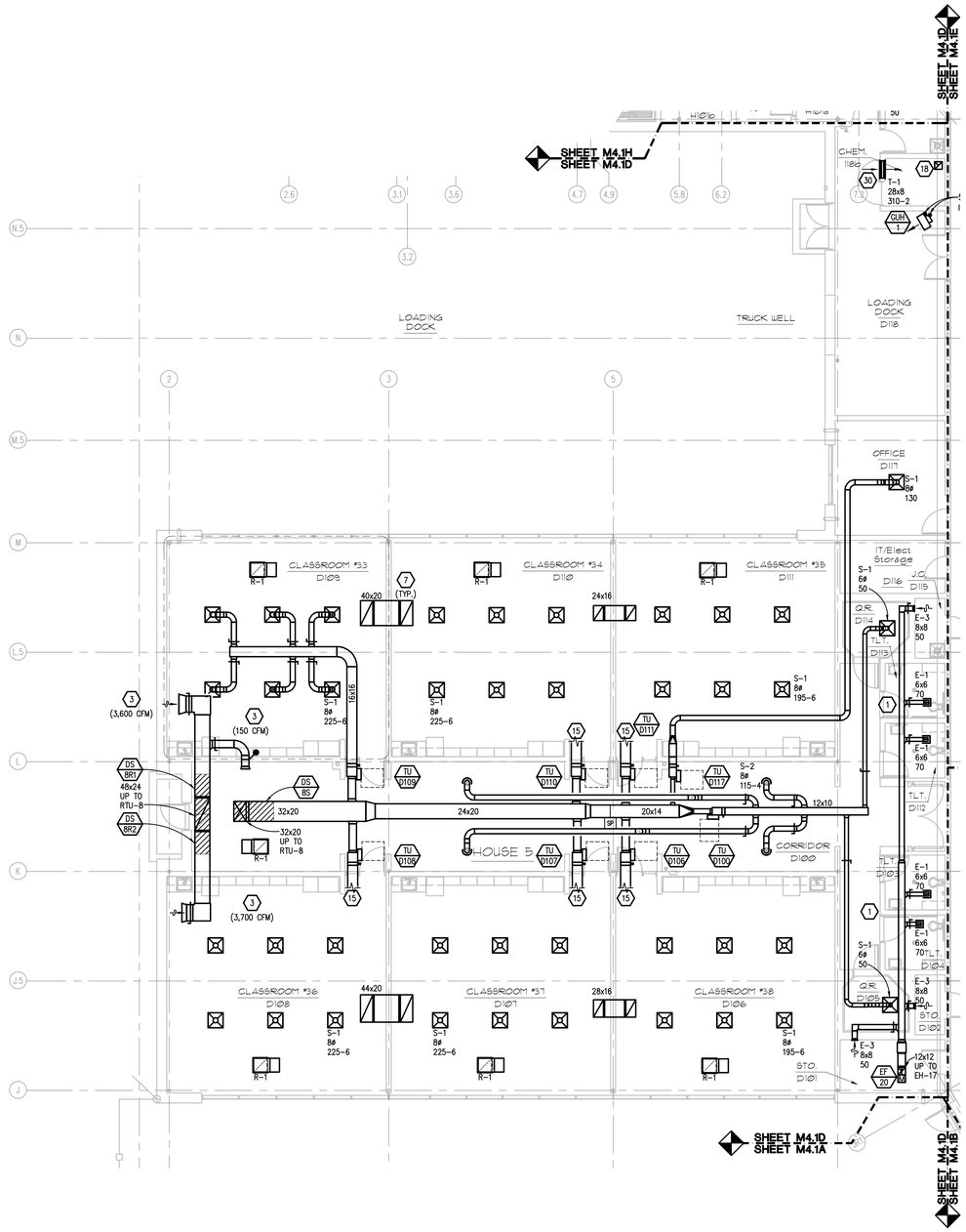

SHEET METAL PLAN - ZONE D
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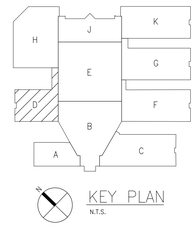

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PBA Project No.: 2019-0237

PROJECT TITLE

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DRAWING TITLE

SHEET METAL PLAN - ZONE D

ISSUE DATES

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05-01-2020	95% REVIEW - BP3
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DRAWN	JRM
CHECKED	SVM
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PROJECT NO.

19040

DRAWING NO.

M4.1D-BP3

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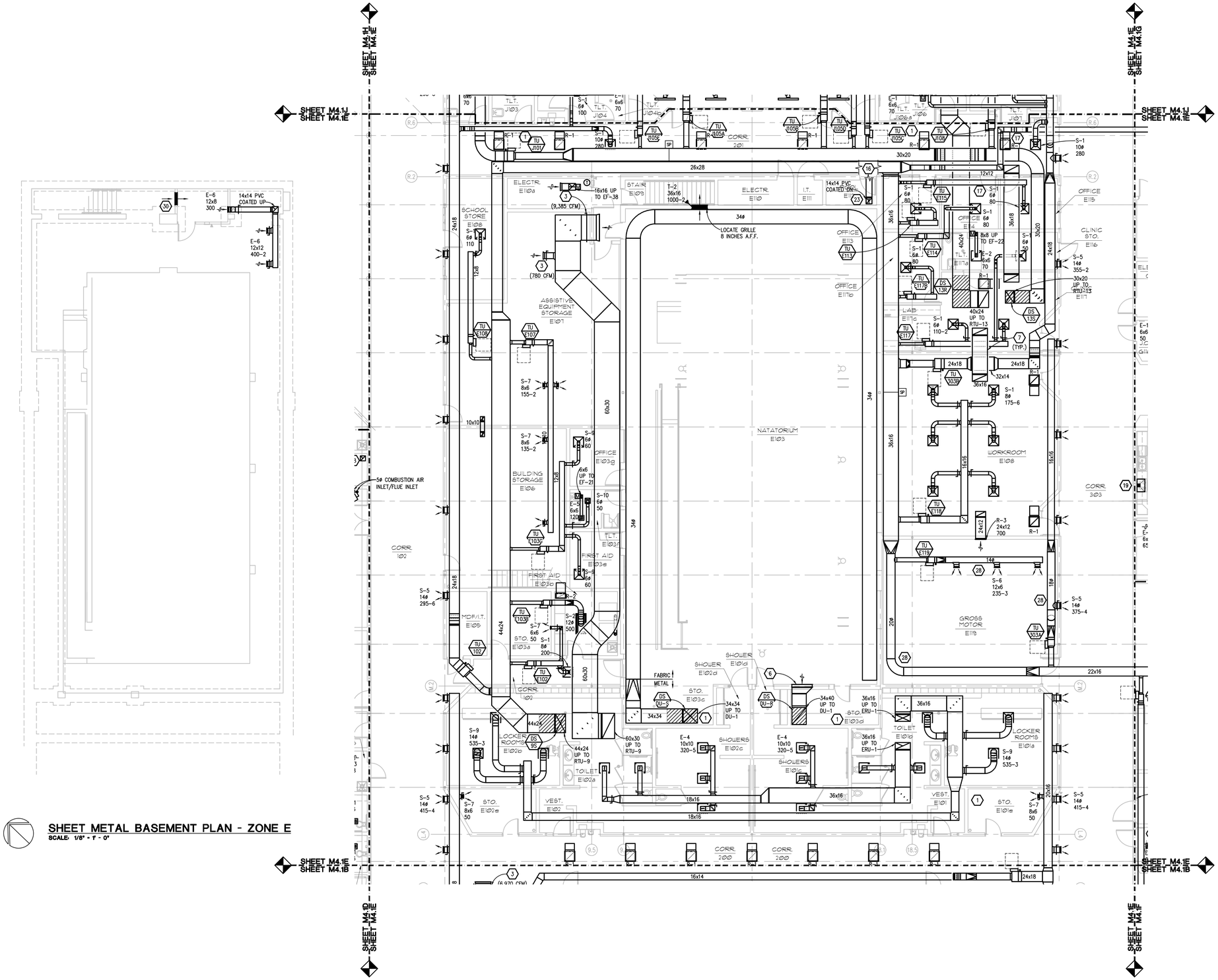

SHEET METAL BASEMENT PLAN - ZONE E

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

SHEET METAL PLAN - ZONE E

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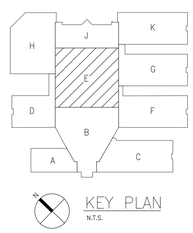
26. PROVIDE ROOF MOUNTED DUCT/PIPE SUPPORT (TYP.).
27. PROVIDE PIPING PORTAL AT PIPING ROOF PENETRATIONS (TYP.).
28. ALL EXPOSED DUCTWORK TO BE DOUBLE WALLED CONSTRUCTION.
29. INSULATE TRANSFER DUCT SAME AS SUPPLY DUCT THROUGH VESTIBULE.
30. INSTALL TRANSFER GRILLE AND DUCTWORK HIGH ON WALL.
31. PROVIDE ACCESS PANEL IN HARD CEILING FOR EXHAUST FAN/DAMPER.
32. PROVIDE CURB ADAPTOR FOR NEW EXHAUST FAN.
33. PROVIDE CEILING ACCESS PANEL.
34. ROUTE 8ø DRYER EXHAUST DUCT UP THROUGH ROOF. TERMINATE DUCT WITH GOOSENECK AND BIRD SCREEN. PROVIDE ROOF CURB AT ROOF PENETRATION.



KEY PLAN
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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

SHEET METAL PLAN - ZONE E

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN JRM
CHECKED SVM
APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M4.1E-BP3

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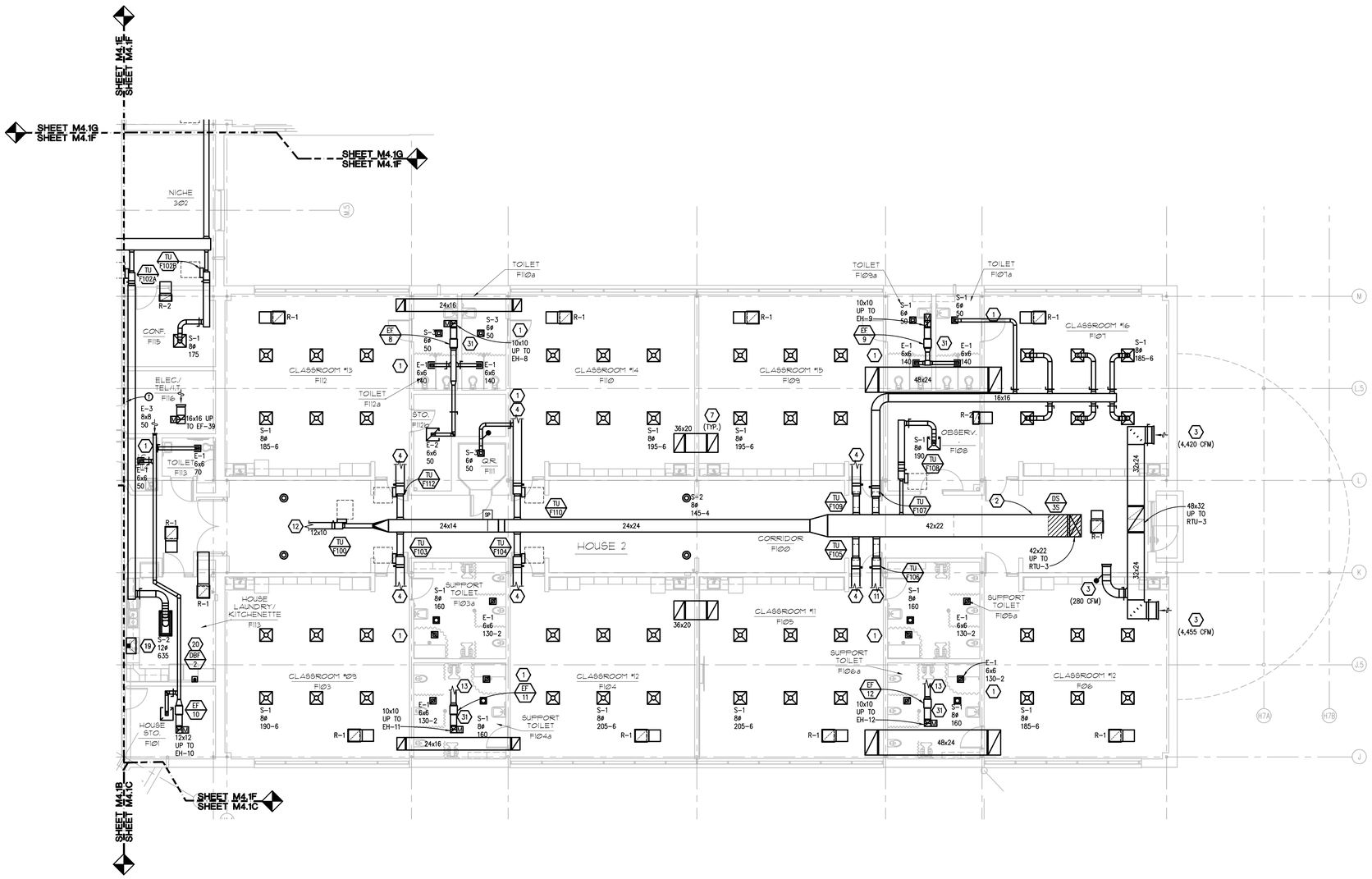

SHEET METAL PLAN - ZONE F

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

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4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.

(#) CONSTRUCTION KEY NOTES:

1. PROVIDE REMOTE CABLE BALANCING SYSTEM FOR VOLUME DAMPERS ABOVE HARD CEILING. LOCATE CONTROLS ABOVE LAY-IN/EXPOSED CEILING ADJACENT TO ROOM
2. FIRST TERMINAL UNIT TO BE AT LEAST 15 FEET AWAY FROM RTU FOR FUTURE INLINE HUMIDIFICATION UNIT. THIS 15 FEET OF DUCT SHALL BE STAINLESS STEEL.
3. BALANCE VOLUME DAMPER TO CFM INDICATED.
4. REFER TO CLASSROOM K112 FOR TYPICAL CLASSROOM DUCTWORK LAYOUT (TYP.).
5. PROVIDE 56"x48" HEAVY DUTY RETURN GRILLE 8" ABOVE FINISHED FLOOR. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
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18. ROUTE 12x12 PVC COATED EXHAUST DUCTWORK DOWN AND TERMINATE 12 INCHES ABOVE FINISHED FLOOR.
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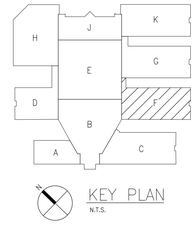

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PROJECT TITLE

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1735 South Wagner Road
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DRAWING TITLE

SHEET METAL PLAN - ZONE F

ISSUE DATES

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M4.1F-BP3

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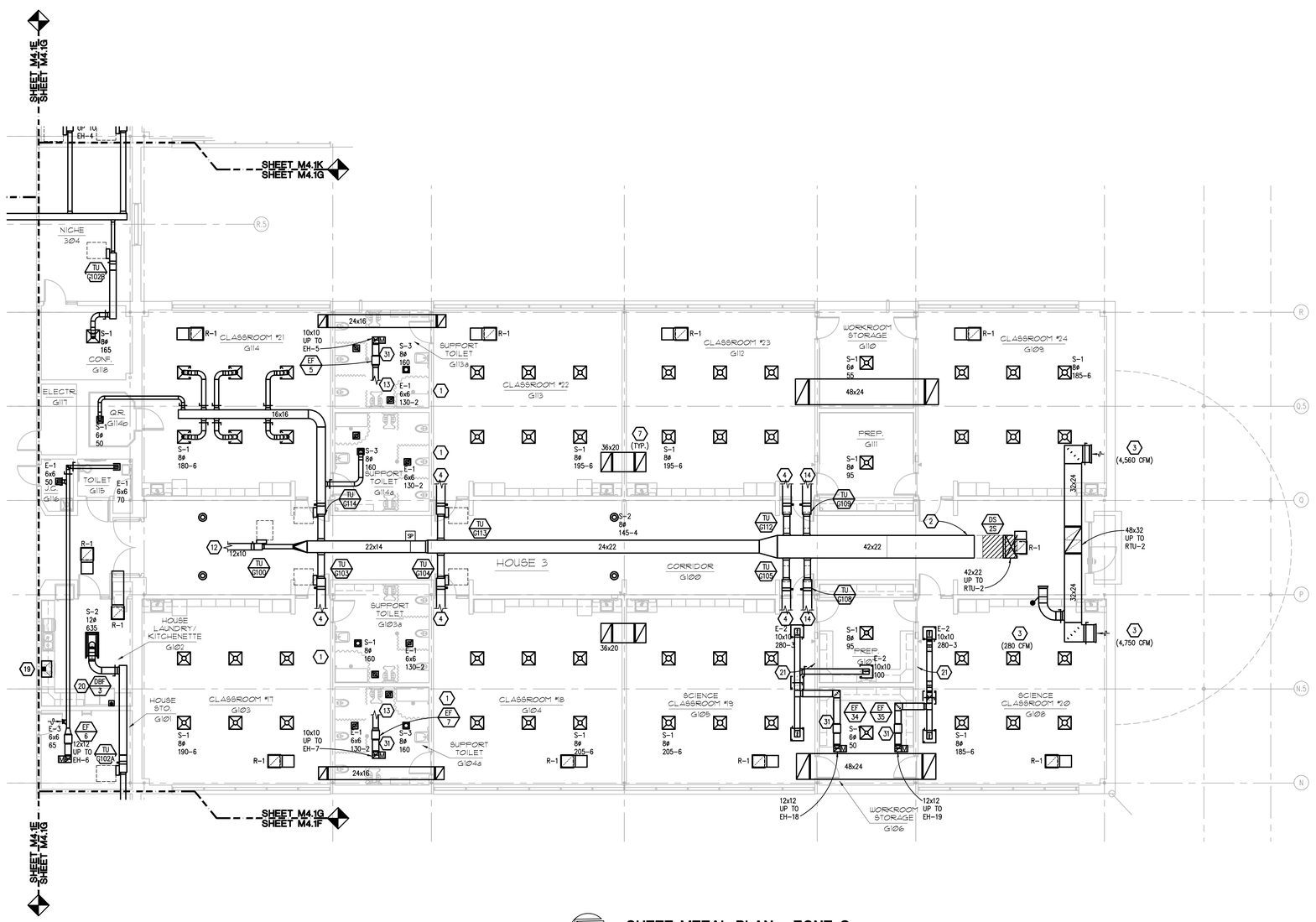

SHEET METAL PLAN - ZONE G

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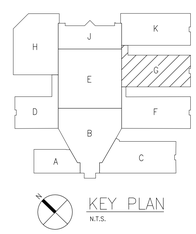

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
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DRAWING TITLE

SHEET METAL PLAN - ZONE G

ISSUE DATES

05-27-2020	FOR CONSTRUCTION - BID PACK #3
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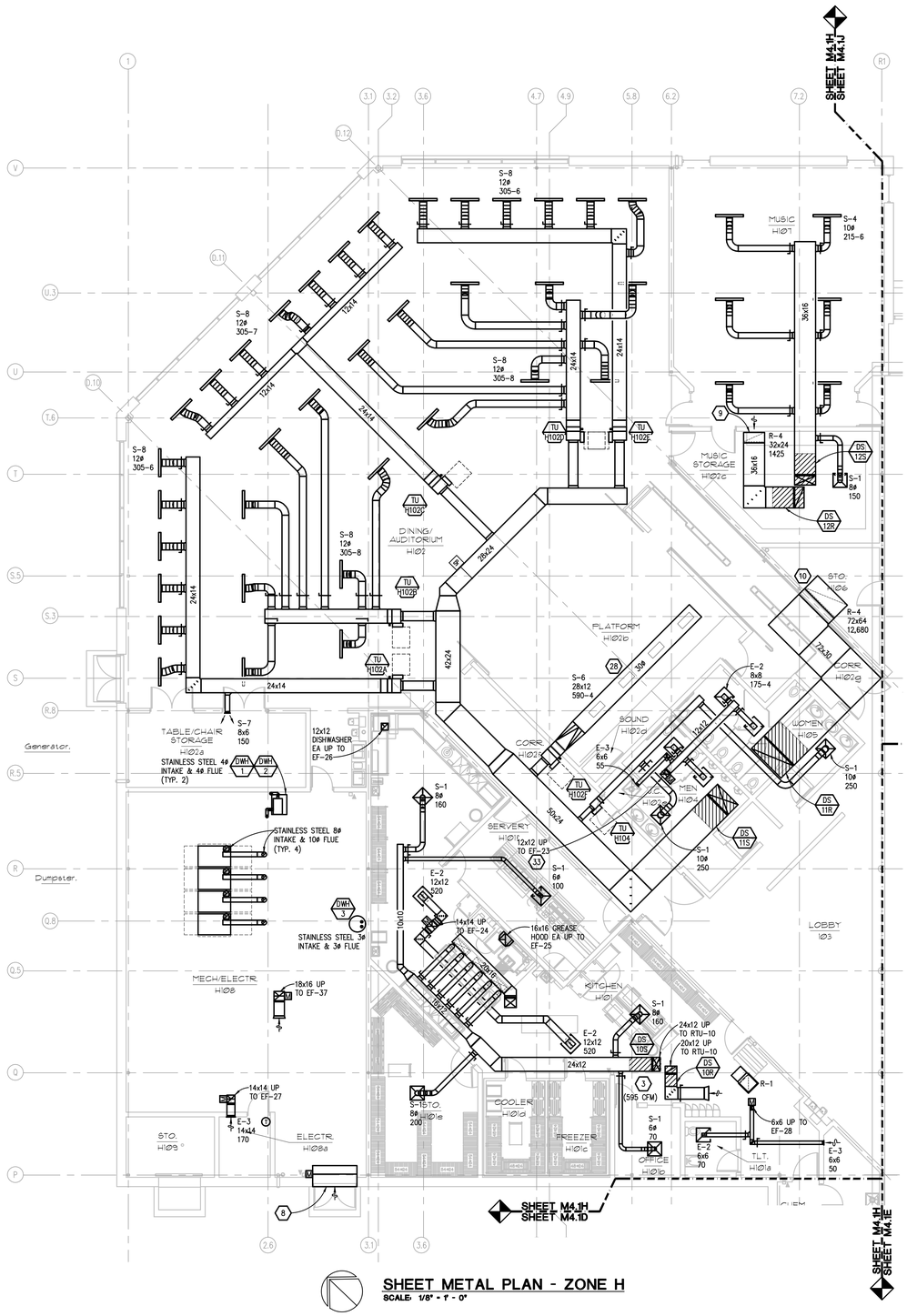

SHEET METAL PLAN - ZONE H

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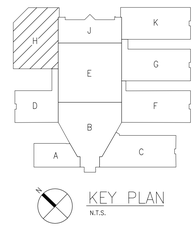

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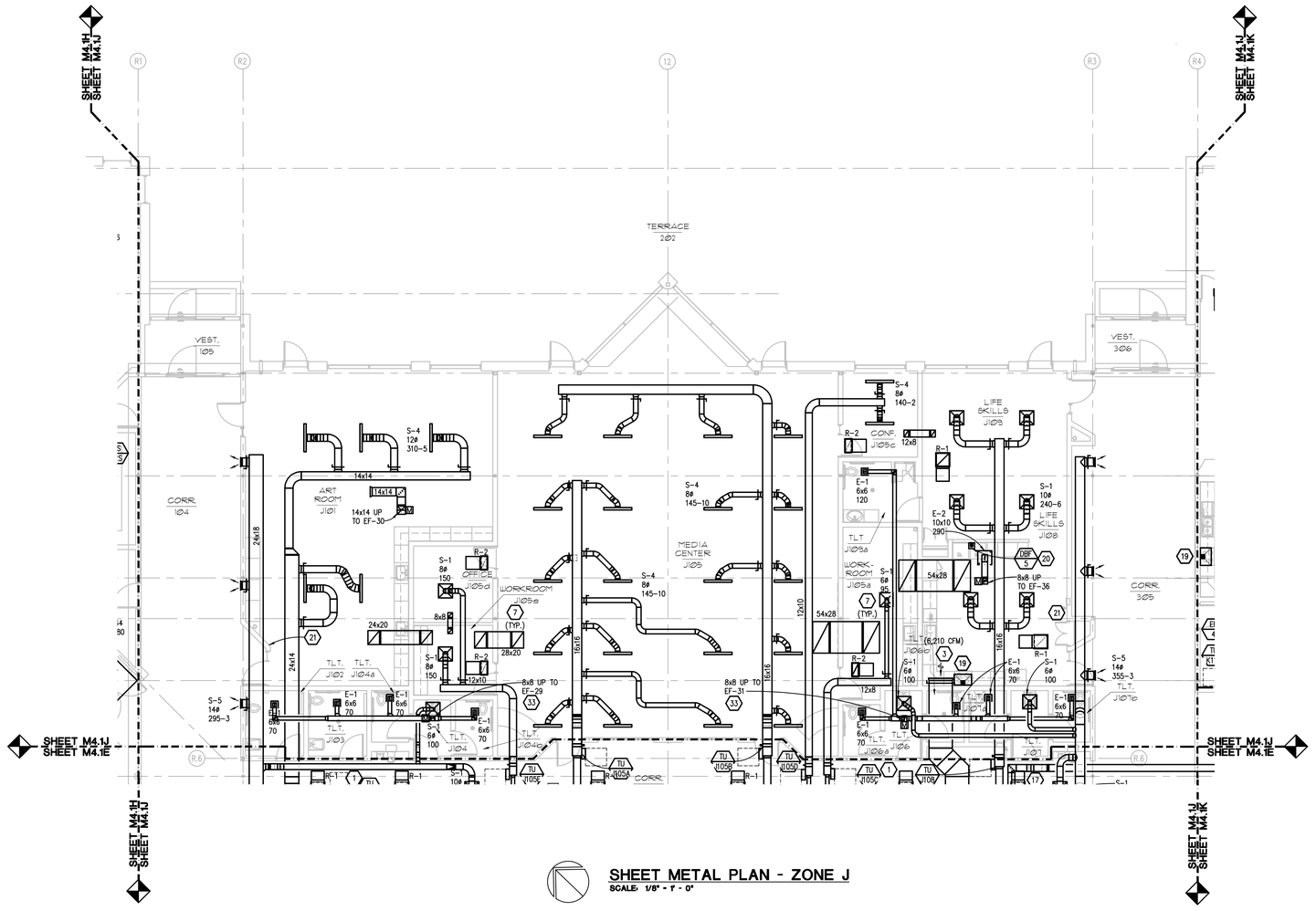

SHEET METAL PLAN - ZONE J

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6. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.

CONSTRUCTION KEY NOTES:

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2. FIRST TERMINAL UNIT TO BE AT LEAST 15 FEET AWAY FROM RTU FOR FUTURE INLINE HUMIDIFICATION UNIT. THIS 15 FEET OF DUCT SHALL BE STAINLESS STEEL.
3. BALANCE VOLUME DAMPER TO CFM INDICATED.
4. REFER TO CLASSROOM K112 FOR TYPICAL CLASSROOM DUCTWORK LAYOUT (TYP.).
5. PROVIDE 56"x48" HEAVY DUTY RETURN GRILLE 8" ABOVE FINISHED FLOOR. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
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16. REFER TO M5.1B FOR DUCTWORK CONTINUATION.
17. ROUTE DUCTWORK THROUGH WEBBING OF JOIST.
18. ROUTE 12x12 PVC COATED EXHAUST DUCTWORK DOWN AND TERMINATE 12 INCHES ABOVE FINISHED FLOOR.
19. PROVIDE RANGE HOOD GE JVW5301SJSS OR ARCHITECTURAL APPROVED EQUAL. ROUTE EXHAUST DUCTWORK UP THROUGH ROOF AND TERMINATE WITH GOOSE NECK AND BIRDSCREEN.
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26. PROVIDE ROOF MOUNTED DUCT/PIPE SUPPORT (TYP.).
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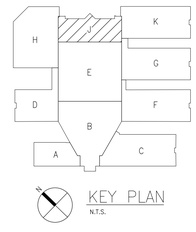

KEY PLAN
N.T.S.

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
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DRAWING TITLE

SHEET METAL PLAN - ZONE J

ISSUE DATES

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DRAWN JRM
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M4.1J-BP3

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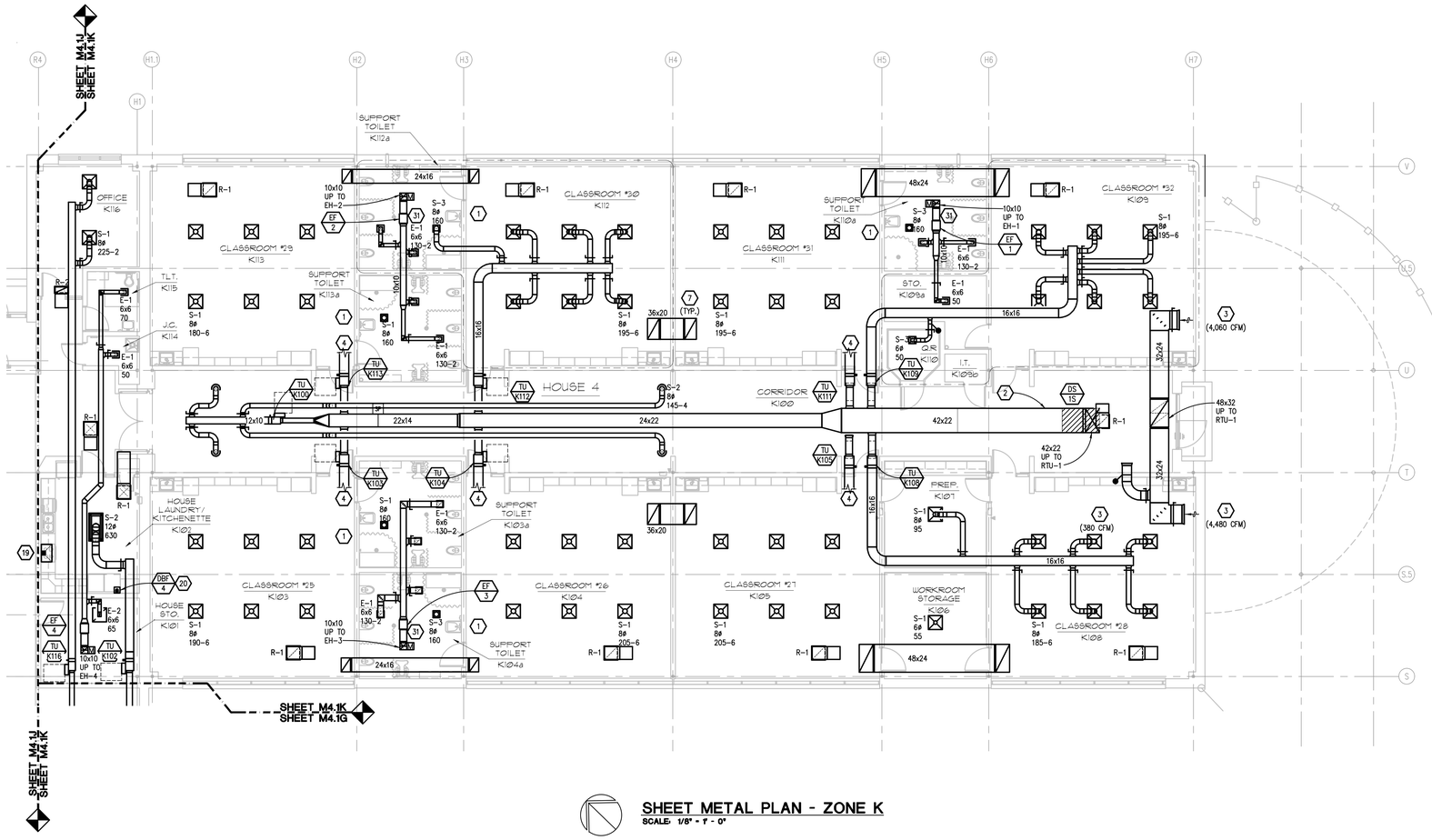

SHEET METAL PLAN - ZONE K

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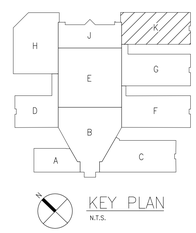

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PROJECT TITLE

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DRAWING TITLE

SHEET METAL PLAN - ZONE K

ISSUE DATES

05-27-2020	FOR CONSTRUCTION – BID PACK #3
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M4.1K-BP3

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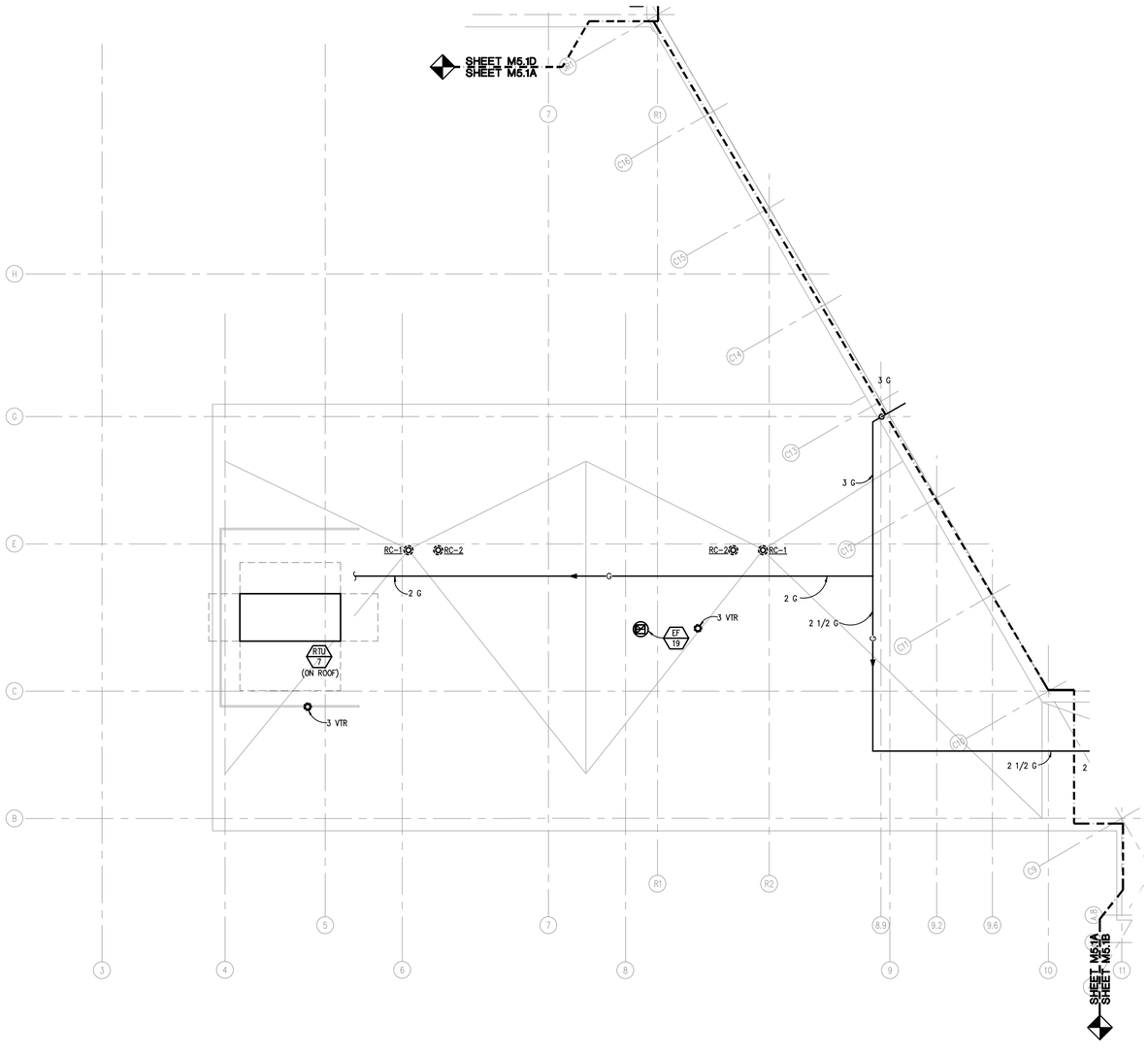

MECHANICAL ROOF PLAN - ZONE A

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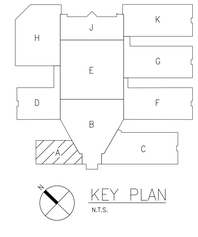

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PROJECT TITLE

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DRAWING TITLE

MECHANICAL ROOF PLAN - ZONE A

ISSUE DATES

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19040

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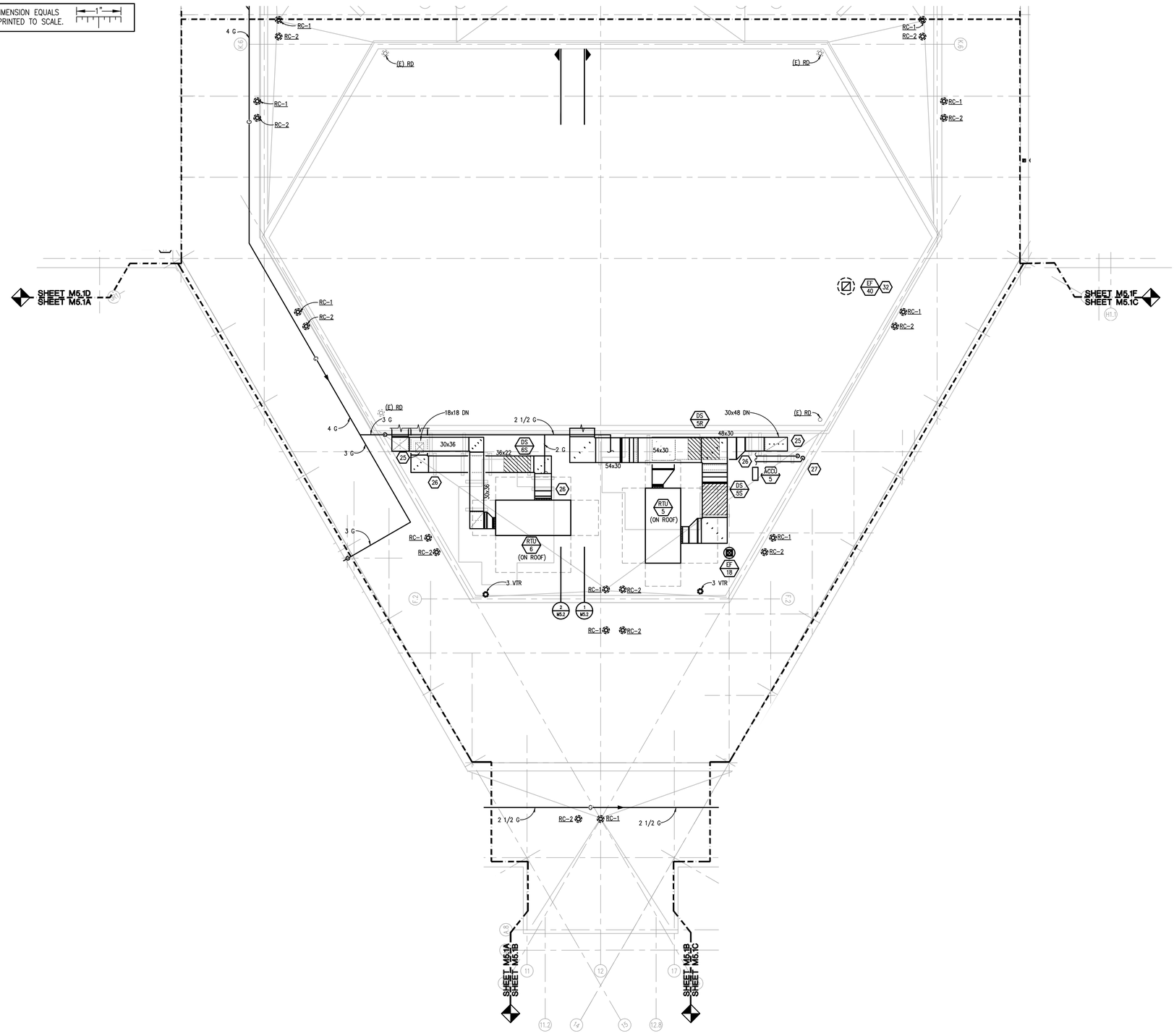

MECHANICAL ROOF PLAN - ZONE B
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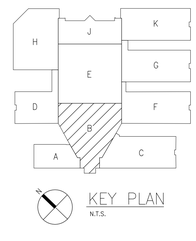

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

MECHANICAL ROOF PLAN - ZONE B

ISSUE DATES

05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN	AJL
CHECKED	SVM
APPROVED	RNR

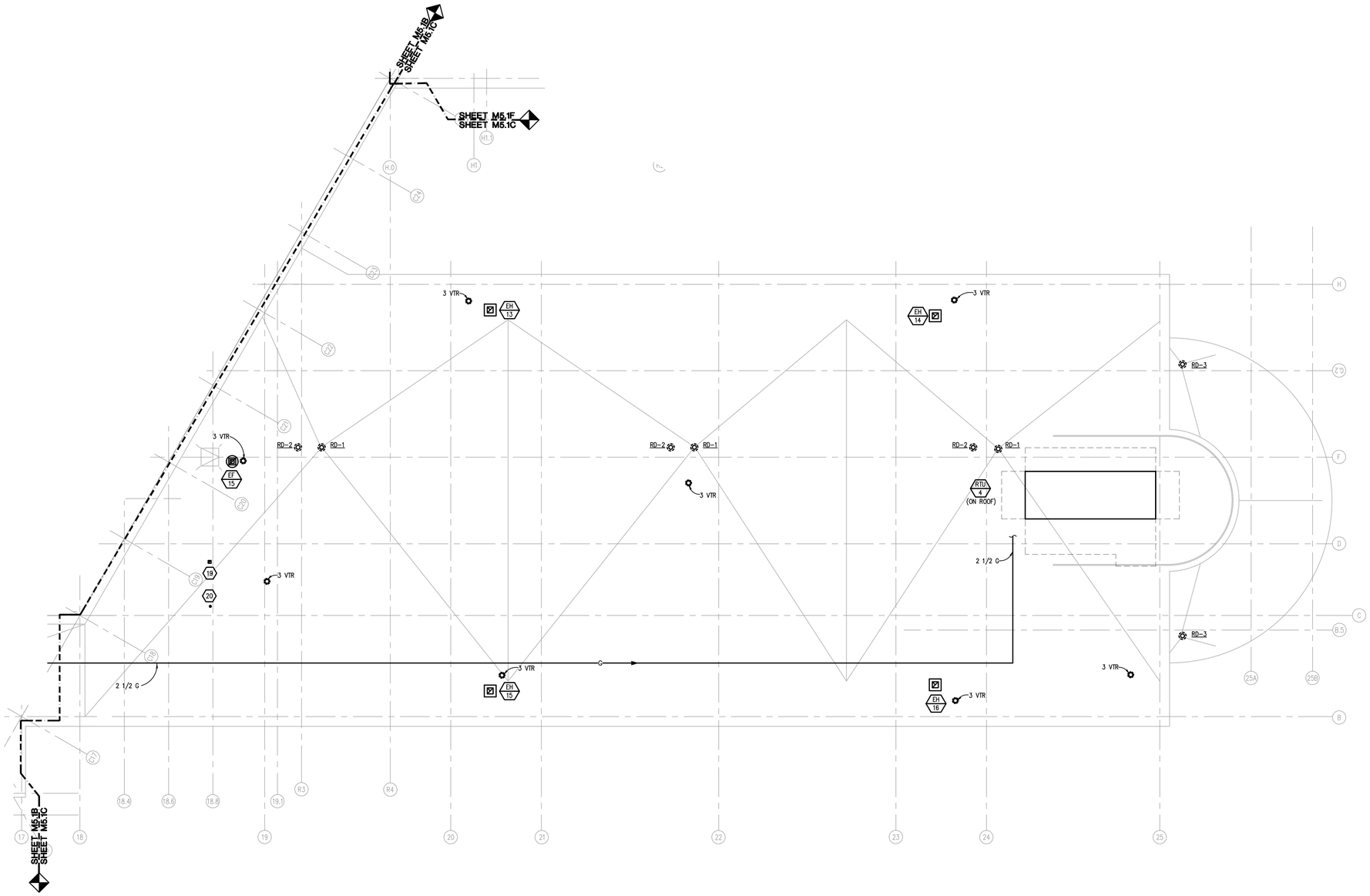
PROJECT NO.

19040

DRAWING NO.

M5.1B-BP3

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



MECHANICAL ROOF PLAN - ZONE C

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

SHEET METAL GENERAL NOTES:

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2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.

(#) CONSTRUCTION KEY NOTES:

1. PROVIDE REMOTE CABLE BALANCING SYSTEM FOR VOLUME DAMPERS ABOVE HARD CEILING. LOCATE CONTROLS ABOVE LAY-IN/EXPOSED CEILING ADJACENT TO ROOM
2. FIRST TERMINAL UNIT TO BE AT LEAST 15 FEET AWAY FROM RTU FOR FUTURE INLINE HUMIDIFICATION UNIT. THIS 15 FEET OF DUCT SHALL BE STAINLESS STEEL.
3. BALANCE VOLUME DAMPER TO CFM INDICATED.
4. REFER TO CLASSROOM K112 FOR TYPICAL CLASSROOM DUCTWORK LAYOUT (TYP.).
5. PROVIDE 56"x48" HEAVY DUTY RETURN GRILLE 8" ABOVE FINISHED FLOOR. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
6. PROVIDE 48"x72" LOW ALUMINUM EXTERIOR LOUVER. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
7. PROVIDE RETURN AIR TRANSFER DUCTWORK. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
8. PROVIDE 76"x16" ARCHITECTURAL LOUVER. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
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15. REFER TO D109 FOR TYPICAL DUCTWORK LAYOUT (TYP.).
16. REFER TO M5.1B FOR DUCTWORK CONTINUATION.
17. ROUTE DUCTWORK THROUGH WEBBING OF JOIST.
18. ROUTE 12x12 PVC COATED EXHAUST DUCTWORK DOWN AND TERMINATE 12 INCHES ABOVE FINISHED FLOOR.
19. PROVIDE RANGE HOOD GE JVW5301SJSS OR ARCHITECTURAL APPROVED EQUAL. ROUTE EXHAUST DUCTWORK UP THROUGH ROOF AND TERMINATE WITH GOOSE NECK AND BIRDSCREEN.
20. PROVIDE DRYER BOOSTER FAN FANTECH DBF4XL OR APPROVED EQUAL WITH SERVICE TRAP VIEW PORT. ROUTE EXHAUST DUCTWORK UP THROUGH ROOF WITH GOOSE NECK TERMINATION. WITH BIRDSCREEN.
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28. ALL EXPOSED DUCTWORK TO BE DOUBLE WALLED CONSTRUCTION.
29. INSULATE TRANSFER DUCT SAME AS SUPPLY DUCT THROUGH VESTIBULE.
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31. PROVIDE ACCESS PANEL IN HARD CEILING FOR EXHAUST FAN/DAMPER.
32. PROVIDE CURB ADAPTOR FOR NEW EXHAUST FAN.
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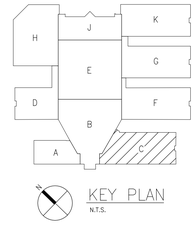

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
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DRAWING TITLE

MECHANICAL ROOF PLAN - ZONE C

ISSUE DATES

05-27-2020	FOR CONSTRUCTION - BID PACK #3
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APPROVED	RNR

PROJECT NO.

19040

DRAWING NO.

M5.1C-BP3

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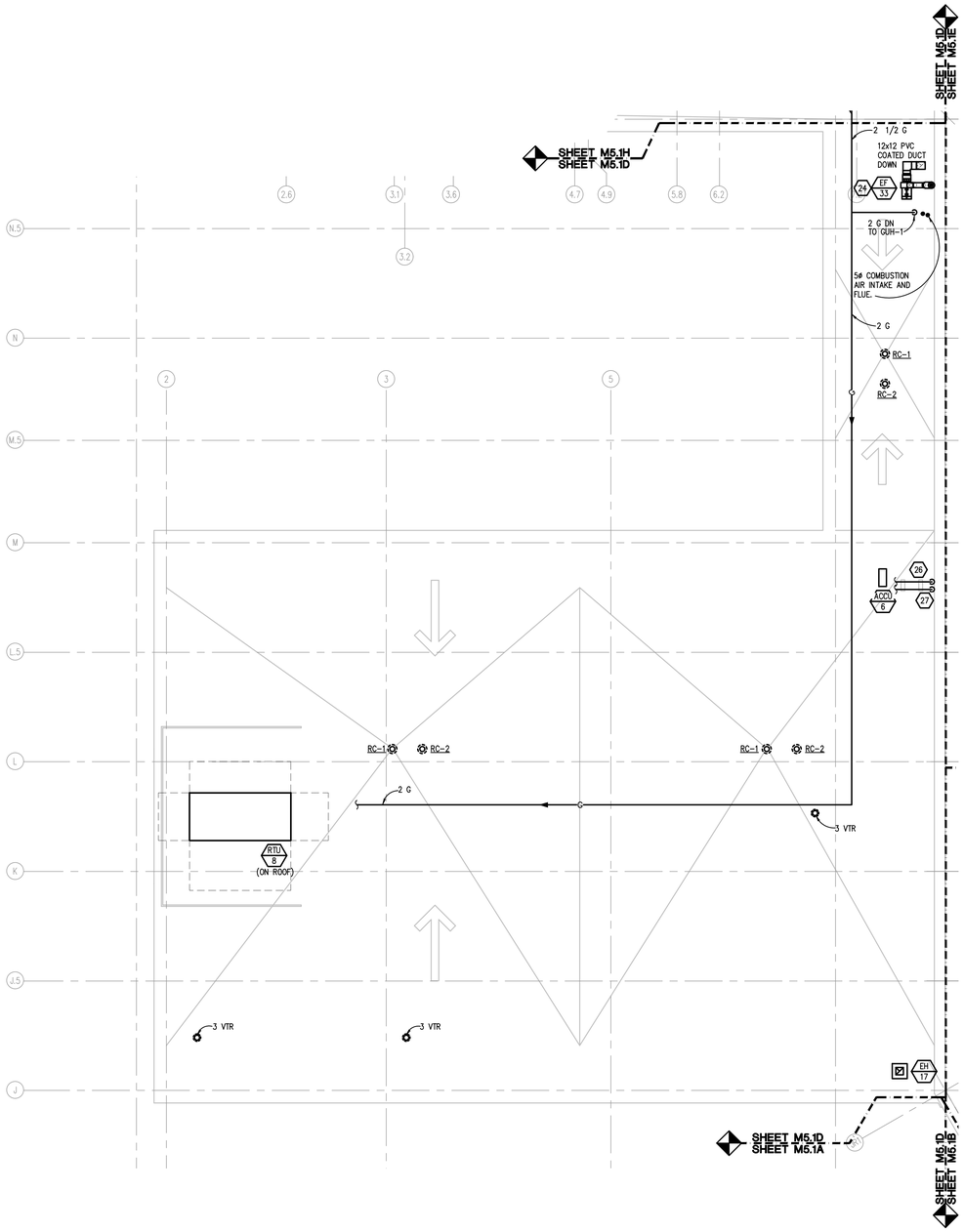

MECHANICAL ROOF PLAN - ZONE D

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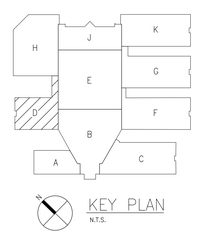

KEY PLAN
N.T.S.

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

MECHANICAL ROOF PLAN - ZONE D

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	AJL
CHECKED	SVM
APPROVED	RNR

PROJECT NO.

19040

DRAWING NO.

M5.1D-BP3

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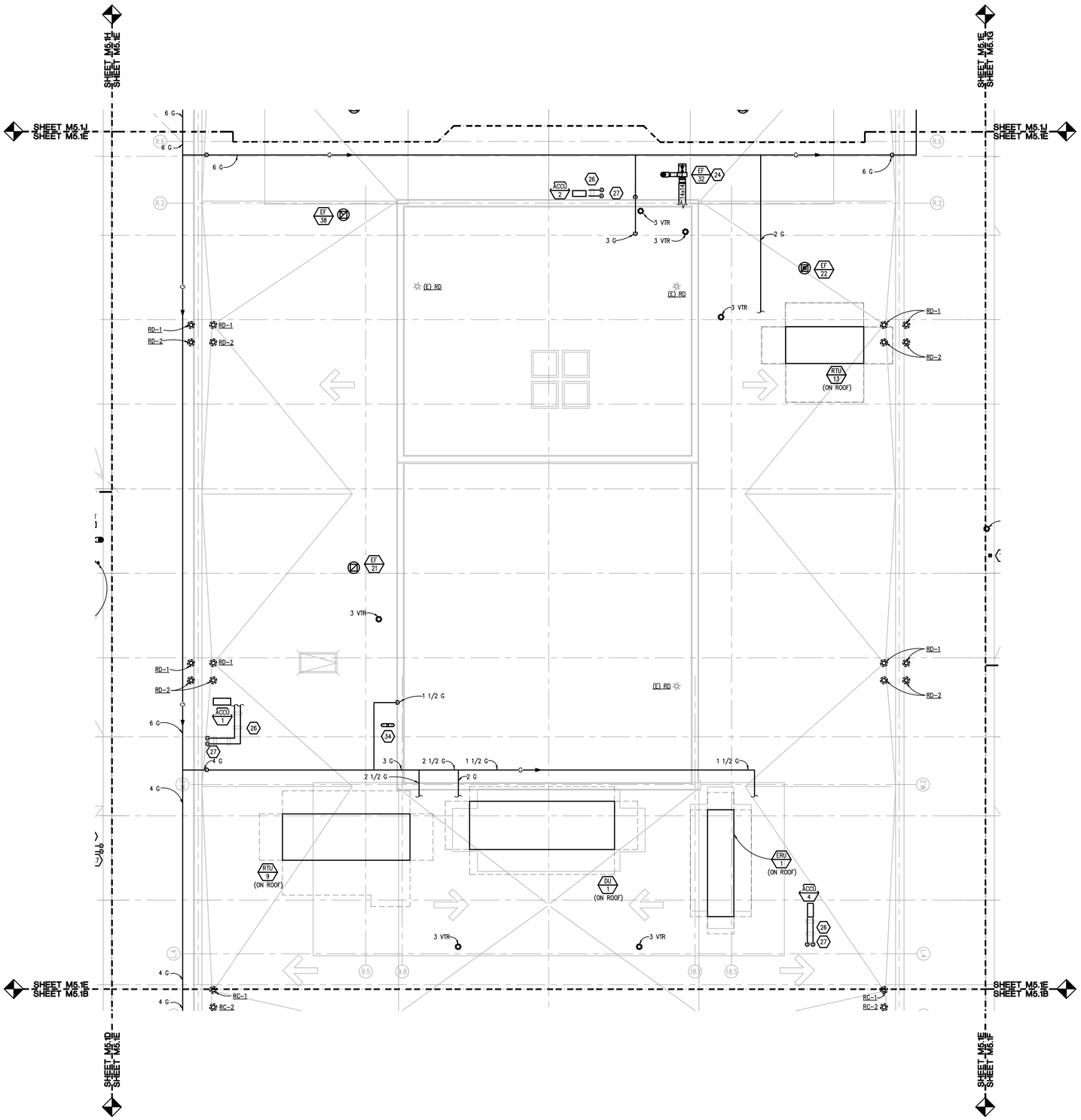

MECHANICAL ROOF PLAN - ZONE E

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18. ROUTE 12x12 PVC COATED EXHAUST DUCTWORK DOWN AND TERMINATE 12 INCHES ABOVE FINISHED FLOOR.
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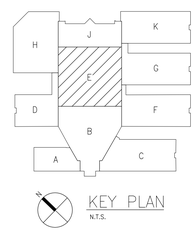

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DRAWING TITLE

MECHANICAL ROOF PLAN - ZONE E

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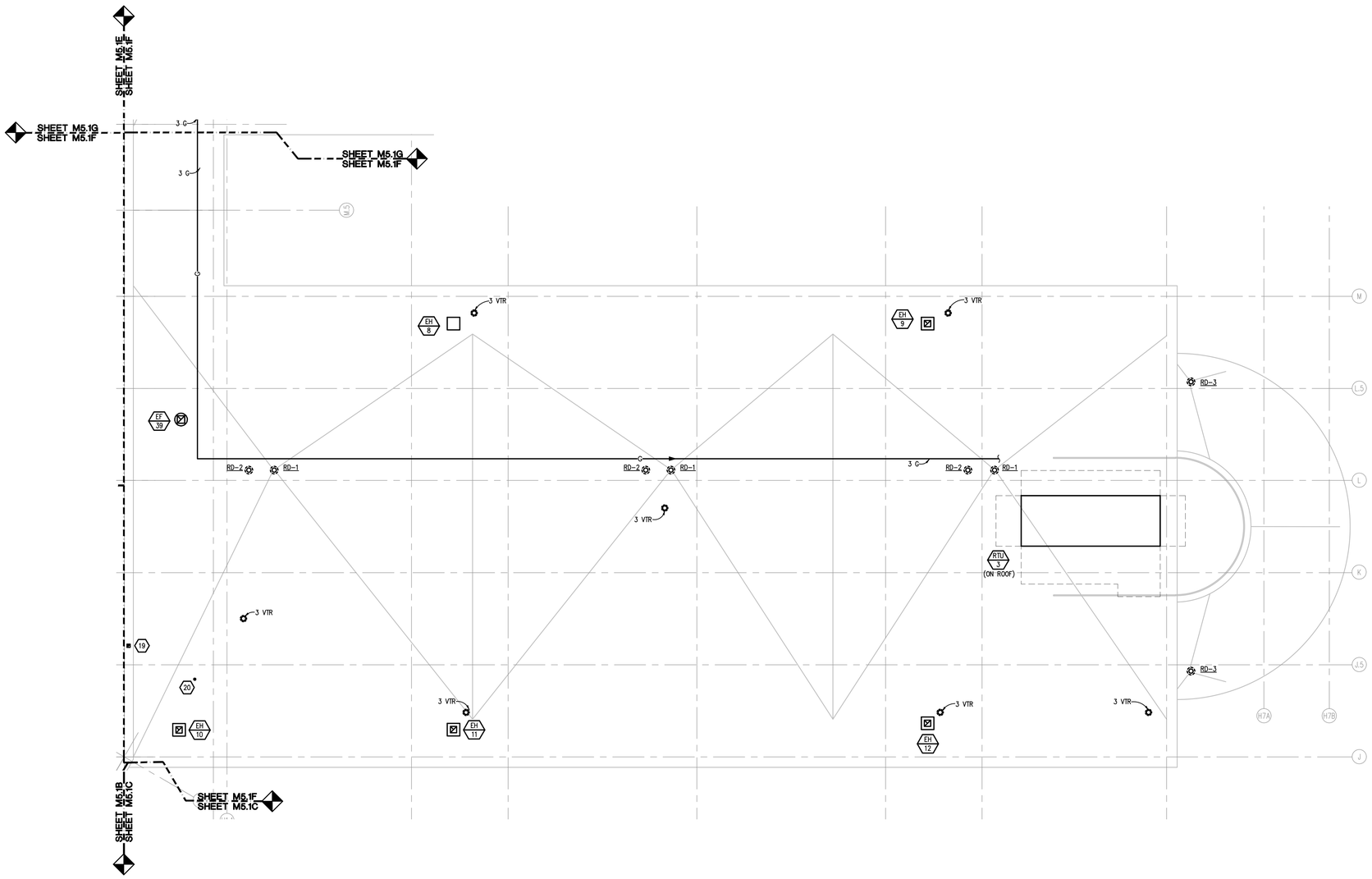

MECHANICAL ROOF PLAN - ZONE F
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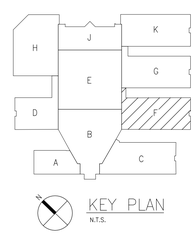

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
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DRAWING TITLE

MECHANICAL ROOF PLAN - ZONE F

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DRAWN	AJL
CHECKED	SVM
APPROVED	RNR

PROJECT NO.

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DRAWING NO.

M5.1F-BP3

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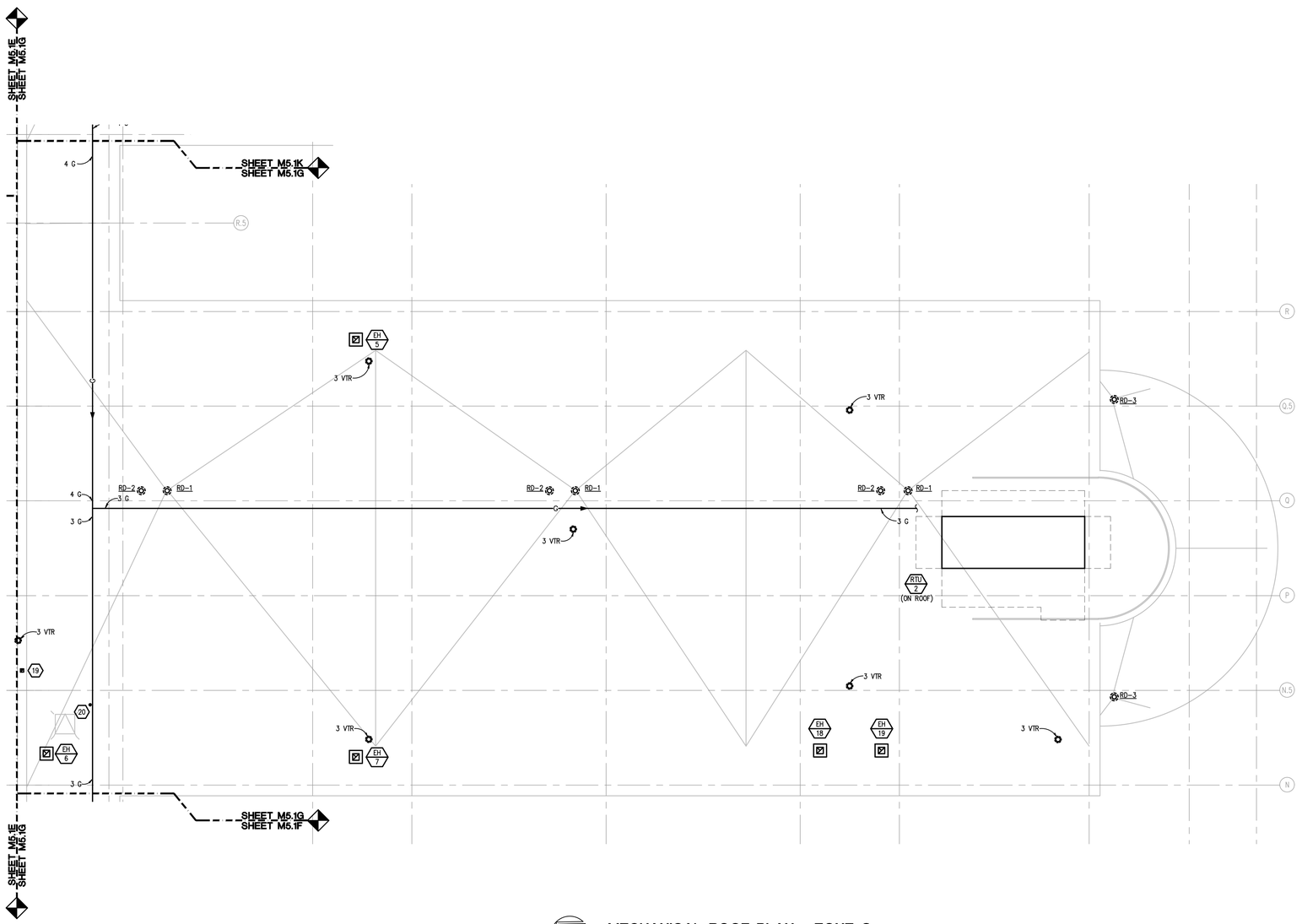

MECHANICAL ROOF PLAN - ZONE G

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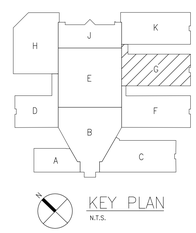

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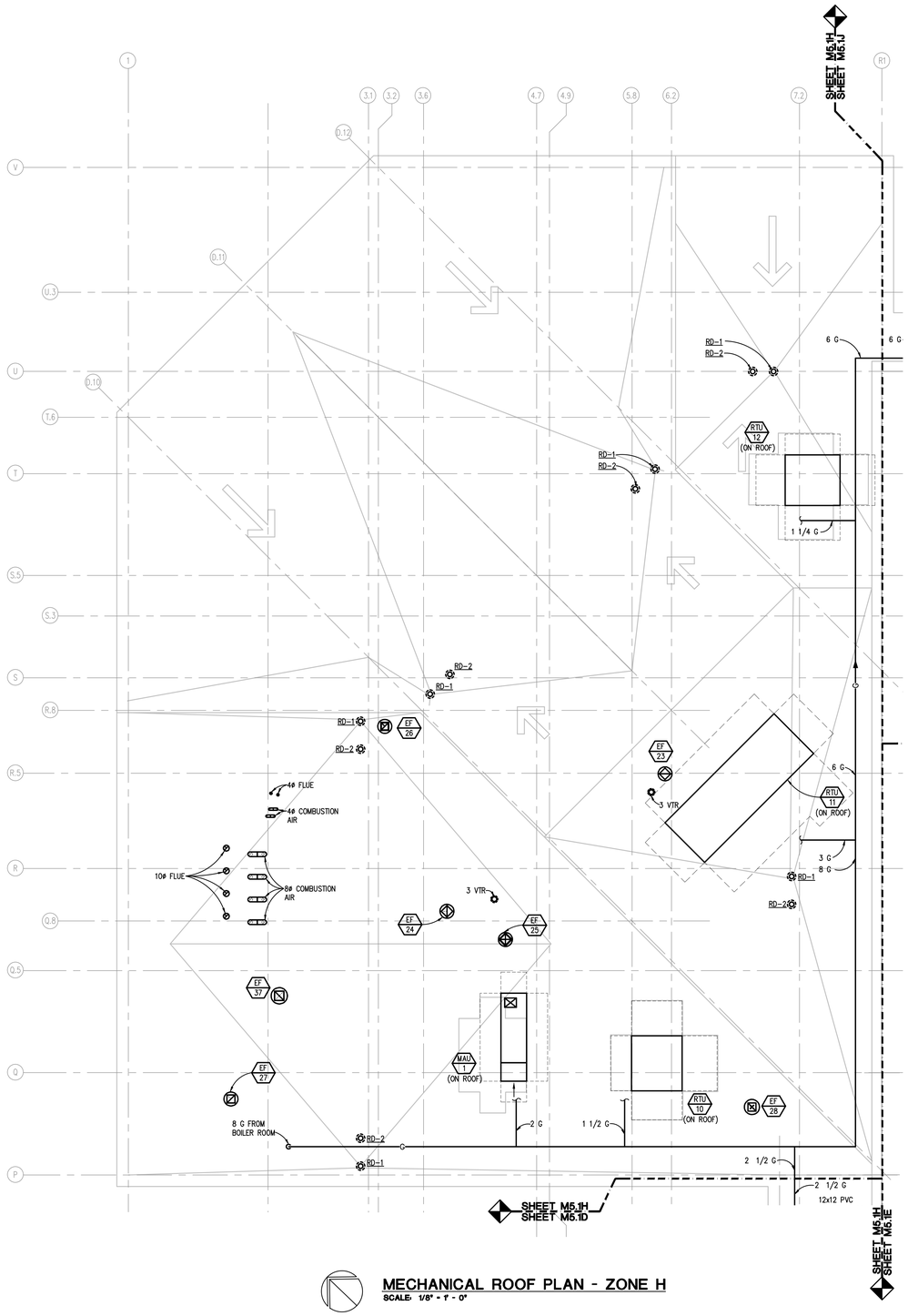

MECHANICAL ROOF PLAN - ZONE H

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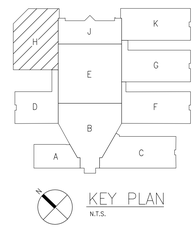

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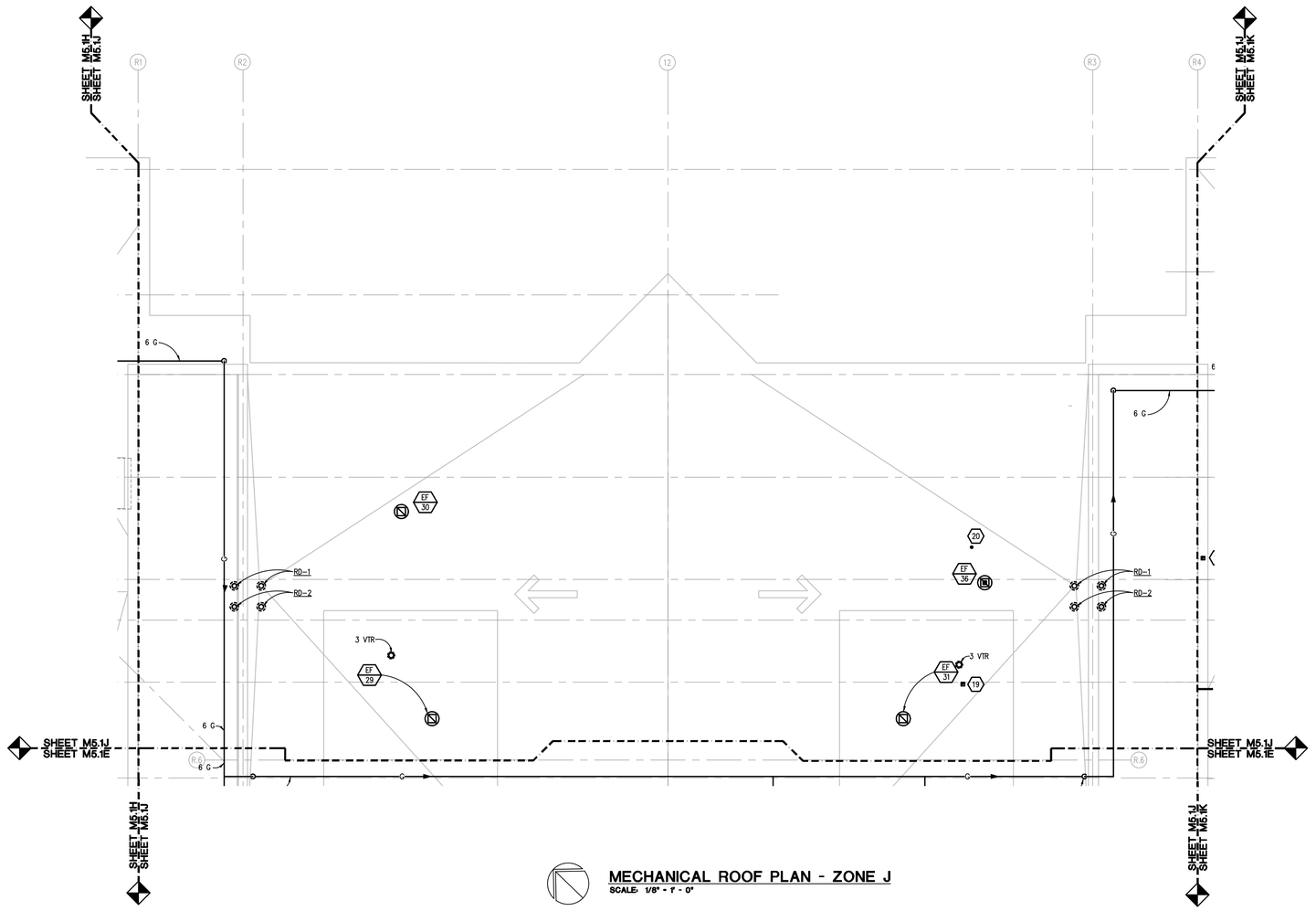

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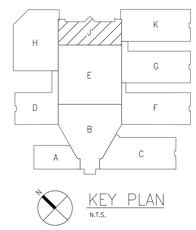

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

MECHANICAL ROOF PLAN - ZONE J

ISSUE DATES

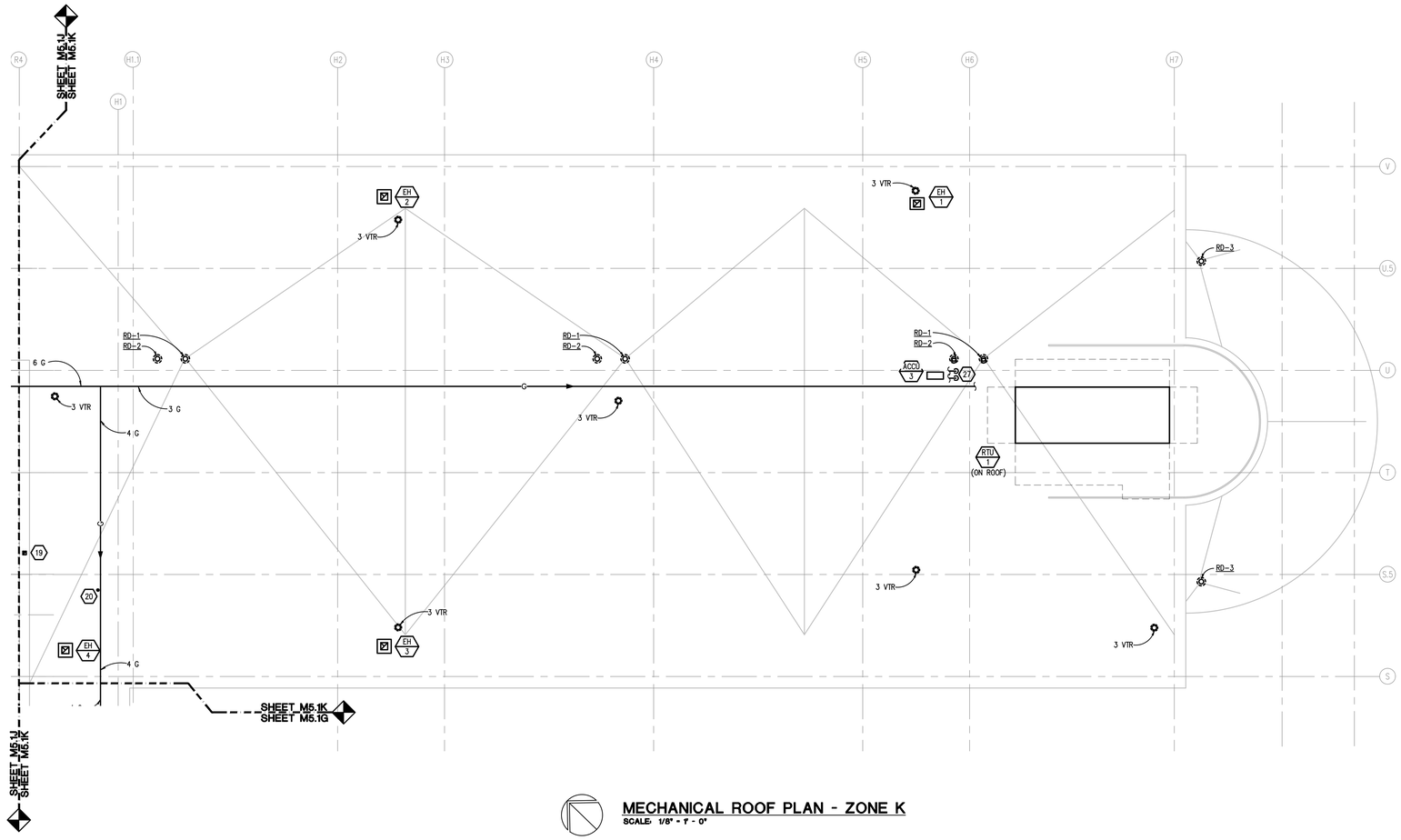
DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	AJL
CHECKED	SVM
APPROVED	RNR

PROJECT NO.
19040

DRAWING NO.
M5.1J-BP3

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



MECHANICAL ROOF PLAN - ZONE K

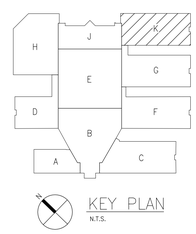
SCALE: 1/8" = 1' - 0"

SHEET METAL GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.

(#) CONSTRUCTION KEY NOTES:

1. PROVIDE REMOTE CABLE BALANCING SYSTEM FOR VOLUME DAMPERS ABOVE HARD CEILING. LOCATE CONTROLS ABOVE LAY-IN/EXPOSED CEILING ADJACENT TO ROOM
2. FIRST TERMINAL UNIT TO BE AT LEAST 15 FEET AWAY FROM RTU FOR FUTURE INLINE HUMIDIFICATION UNIT. THIS 15 FEET OF DUCT SHALL BE STAINLESS STEEL.
3. BALANCE VOLUME DAMPER TO CFM INDICATED.
4. REFER TO CLASSROOM K112 FOR TYPICAL CLASSROOM DUCTWORK LAYOUT (TYP.).
5. PROVIDE 56"x48" HEAVY DUTY RETURN GRILLE 8" ABOVE FINISHED FLOOR. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
6. PROVIDE 48"x72" LOW ALUMINUM EXTERIOR LOUVER. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
7. PROVIDE RETURN AIR TRANSFER DUCTWORK. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
8. PROVIDE 76"x16" ARCHITECTURAL LOUVER. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS.
9. PROVIDE 32"x24" LOW HEAVY DUTY RETURN GRILLE. REFER TO HEAVY DUTY RETURN AIR GRILLE DETAIL FOR ADDITIONAL REQUIREMENTS.
10. PROVIDE 72"x64" LOW HEAVY DUTY RETURN GRILLE. REFER TO HEAVY DUTY RETURN AIR GRILLE DETAILS FOR ADDITIONAL REQUIREMENTS.
11. REFER TO CLASSROOM K109 FOR TYPICAL CLASSROOM DUCTWORK LAYOUT (TYP.).
12. REFER TO CORRIDOR K100 FOR TYPICAL CORRIDOR DUCTWORK LAYOUT (TYP.).
13. REFER TO EF-2 IN K112A AND K113A FOR TYPICAL EXHAUST DUCTWORK LAYOUT (TYP.).
14. REFER TO CLASSROOM K108 FOR TYPICAL DUCTWORK LAYOUT (TYP.).
15. REFER TO D109 FOR TYPICAL DUCTWORK LAYOUT (TYP.).
16. REFER TO M5.1B FOR DUCTWORK CONTINUATION.
17. ROUTE DUCTWORK THROUGH WEBBING OF JOIST.
18. ROUTE 12x12 PVC COATED EXHAUST DUCTWORK DOWN AND TERMINATE 12 INCHES ABOVE FINISHED FLOOR.
19. PROVIDE RANGE HOOD GE JVW5301SJSS OR ARCHITECTURAL APPROVED EQUAL. ROUTE EXHAUST DUCTWORK UP THROUGH ROOF AND TERMINATE WITH GOOSE NECK AND BIRDSCREEN.
20. PROVIDE DRYER BOOSTER FAN FANTECH DBF4XL OR APPROVED EQUAL WITH SERVICE TRAP VIEW PORT. ROUTE EXHAUST DUCTWORK UP THROUGH ROOF WITH GOOSE NECK TERMINATION. WITH BIRDSCREEN.
21. PROVIDE 2 HOUR MAX DIGITAL TIMER FOR ROOM EXHAUST.
22. REFER TO MEZZANINE PLAN FOR DUCTWORK CONTINUATION.
23. PROVIDE CONCRETE CURB AT FLOOR PENETRATION.
24. 10# STACK WITH 5# DISCHARGE CONE.. REFER TO ROOF EXHAUST FAN AND STACK DETAIL FOR ADDITIONAL REQUIREMENTS.
25. PROVIDE ROOF CURB AT DUCTWORK ROOF PENETRATIONS.
26. PROVIDE ROOF MOUNTED DUCT/PIPE SUPPORT (TYP.).
27. PROVIDE PIPING PORTAL AT PIPING ROOF PENETRATIONS (TYP.).
28. ALL EXPOSED DUCTWORK TO BE DOUBLE WALLED CONSTRUCTION.
29. INSULATE TRANSFER DUCT SAME AS SUPPLY DUCT THROUGH VESTIBULE.
30. INSTALL TRANSFER GRILLE AND DUCTWORK HIGH ON WALL.
31. PROVIDE ACCESS PANEL IN HARD CEILING FOR EXHAUST FAN/DAMPER.
32. PROVIDE CURB ADAPTOR FOR NEW EXHAUST FAN.
33. PROVIDE CEILING ACCESS PANEL.
34. ROUTE 8# DRYER EXHAUST DUCT UP THROUGH ROOF. TERMINATE DUCT WITH GOOSENECK AND BIRD SCREEN. PROVIDE ROOF CURB AT ROOF PENETRATION.



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M5.1K-BP3

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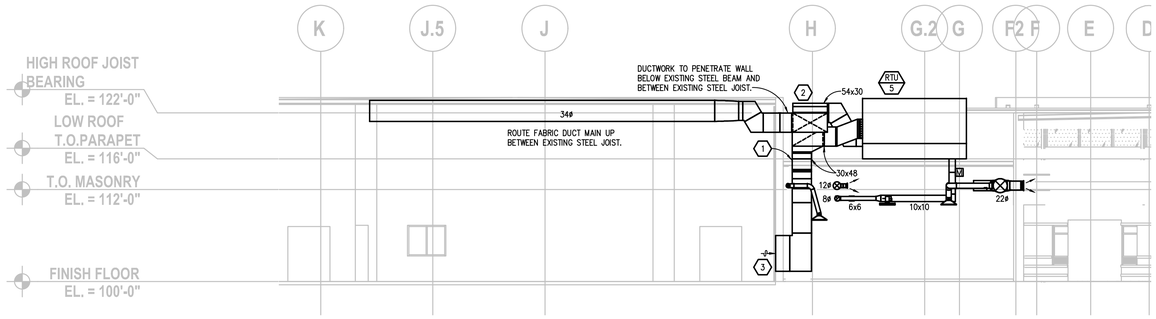
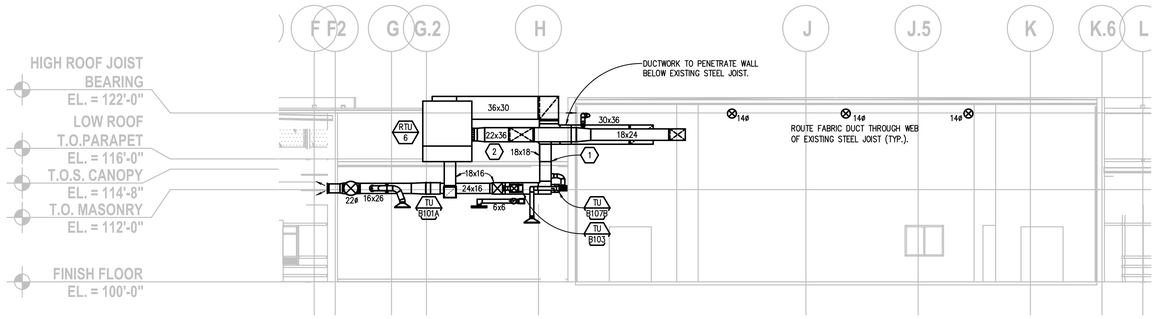


1 / M5.1B **MECHANICAL SECTION**
SCALE: 1/8" = 1' - 0"



2 / M5.1B **MECHANICAL SECTION**
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CHECKED SVM
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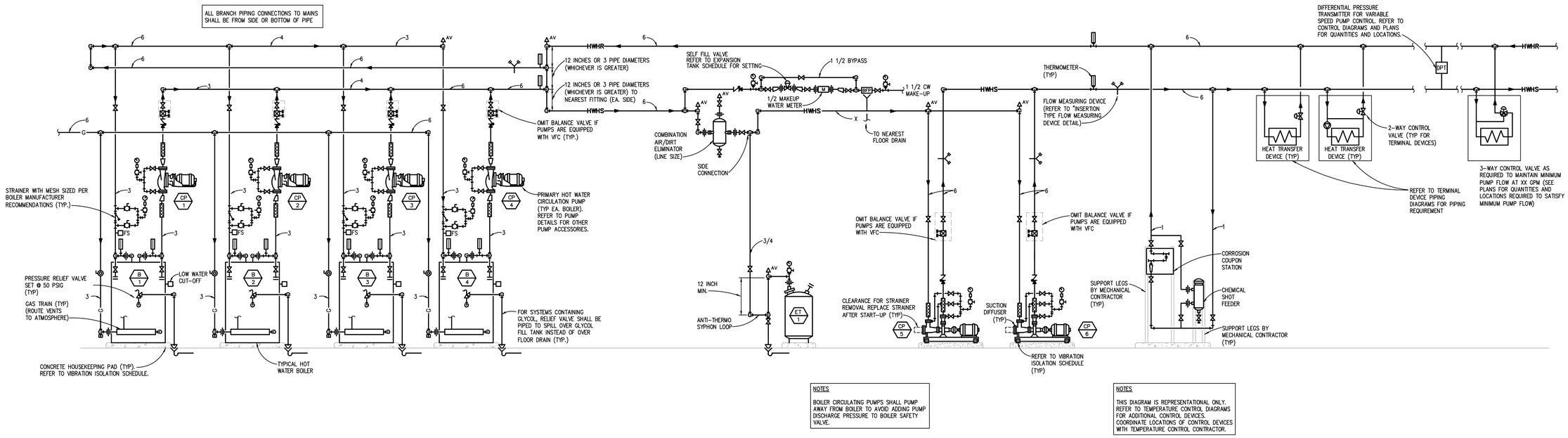
M5.2-BP3



NOTES

BOILER CIRCULATING PUMPS SHALL PUMP AWAY FROM BOILER TO AVOID ADDING PUMP DISCHARGE PRESSURE TO BOILER SAFETY VALVE.

NOTES

THIS DIAGRAM IS REPRESENTATIONAL ONLY. REFER TO TEMPERATURE CONTROL DIAGRAMS FOR ADDITIONAL CONTROL DEVICES. COORDINATE LOCATIONS OF CONTROL DEVICES WITH TEMPERATURE CONTROL CONTRACTOR.

HOT WATER HEATING SYSTEM PIPING DIAGRAM

NO SCALE

GAS LOAD SCHEDULE	
ITEM	CFH
RTU-1	600
RTU-2	600
RTU-3	600
RTU-4	400
RTU-5	450
RTU-6	300
RTU-7	300
RTU-8	300
RTU-9	400
RTU-10	120
RTU-11	600
RTU-12	80
RTU-13	300
ERU-1	200
DU-1	300
MAU-1	250
POOL HEATER	511.5
GUH-1	175
B-1	2000
B-2	2000
B-3	2000
B-4	2000
DWH-1	399
DWH-2	399
DWH-3	199
TILT KETTLE	180
STEAMER	124
CONVECTION OVEN	144
CLOTHES DRYER	113
GENERATOR	1928
TOTAL CONN. GAS LOAD @ 11"W.C.	17972.5

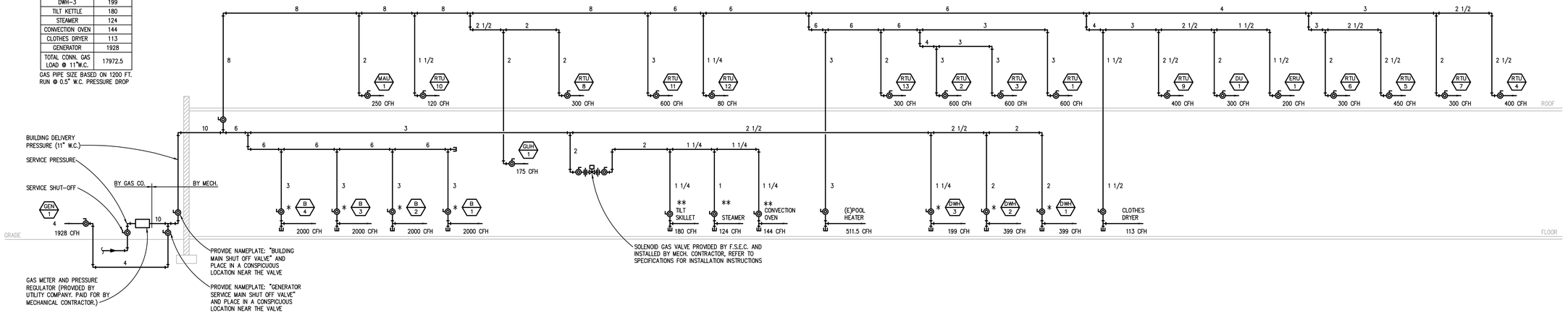
GAS PIPE SIZE BASED ON 1200 FT. RUN @ 0.5" W.C. PRESSURE DROP

*GAS TRAIN PROVIDED BY EQUIPMENT MANUFACTURER - SEE SPECIFICATIONS

**GAS PRESSURE REGULATOR PROVIDED BY FOOD SERVICE MANUFACTURER

***THE GAS SERVICE COMPONENTS SHALL BE RATED IN ACCORDANCE WITH THE FOLLOWING CHART

METER OUTLET PRESSURE (psig)	MINIMUM SYSTEM PRESSURE RATING (psig)
0.4	0.5
1 OR 2	10
3 OR 30	DELIVERY +10
31 TO 100	DELIVERY +20
101 TO 200	DELIVERY +30



NATURAL GAS PIPING DIAGRAM

NO SCALE

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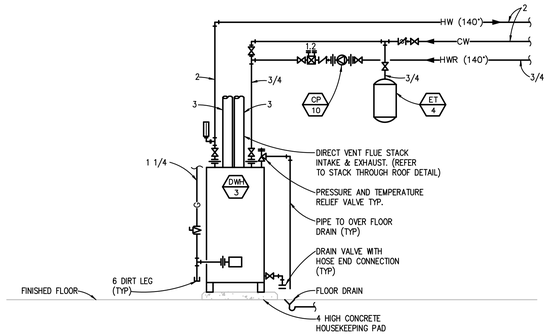
M6.1-BP3



KITCHEN GAS FIRED WATER HEATER PIPING DIAGRAM

NO SCALE

HOT WATER TEMPERATURE SET-UP

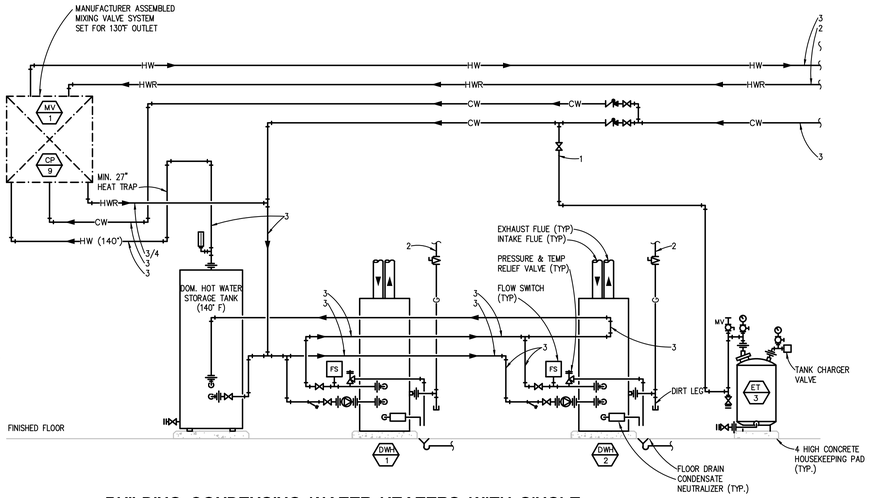
1. CREATE DEMAND GREATER THAN VALVE'S MINIMUM FLOW RATING USING HOSE CONNECTION ON HW LINE WITHIN ASSEMBLY. IF FLOW CAN NOT BE ACHIEVED THIS WAY, TURN ON FIXTURES WITHIN THE BUILDING.
2. ADJUST TEMPERATURE TO 130°F AND LET STABILIZE. RE-ADJUST AS NECESSARRY.
3. SET HIGH LIMIT ON AQUASTAT TO 132°F.

HOT WATER RETURN SET-UP (TO BE DONE AFTER HOT WATER TEMPERATURE SET-UP)

1. ENSURE THERE IS NO FLOW IN THE SYSTEM.
2. SET LOW LIMIT ON AQUASTAT TO 127°F.
3. START RETURN PUMP.
4. OPEN BALANCE VALVE ON RETURN LINE GOING BACK TO WATER HEATER TO 10% OF RETURN FLOW.
5. LET PUMP RUN FOR MINIMUM 30 MINUTES. IF TEMPERATURE INCREASES ON OUTLET OF MIXING VALVE CLOSE THE BALANCE VALVE UNTIL TEMPERATURE IS MAINTAINED. IF TEMPERATURE DECREASES, OPEN THE BALANCE VALVE UNTIL TEMPERATURE IS MAINTAINED.
6. ALLOW PUMP TO CYCLE TO ENSURE IT STARTS AND STOPS AT AQUASTAT SETTINGS.

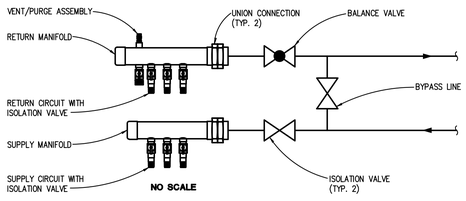
140°F HOT WATER RETURN SET-UP (TO BE DONE AFTER HOT WATER TEMPERATURE SET-UP)

1. ENSURE THERE IS NO FLOW IN THE SYSTEM.
2. SET HIGH LIMIT ON AQUASTAT TO 142°F
3. SET LOW LIMIT ON AQUASTAT TO 137°F.
4. START RETURN PUMP.
5. ALLOW PUMP TO CYCLE TO ENSURE IT STARTS AND STOPS AT AQUASTAT SETTINGS.

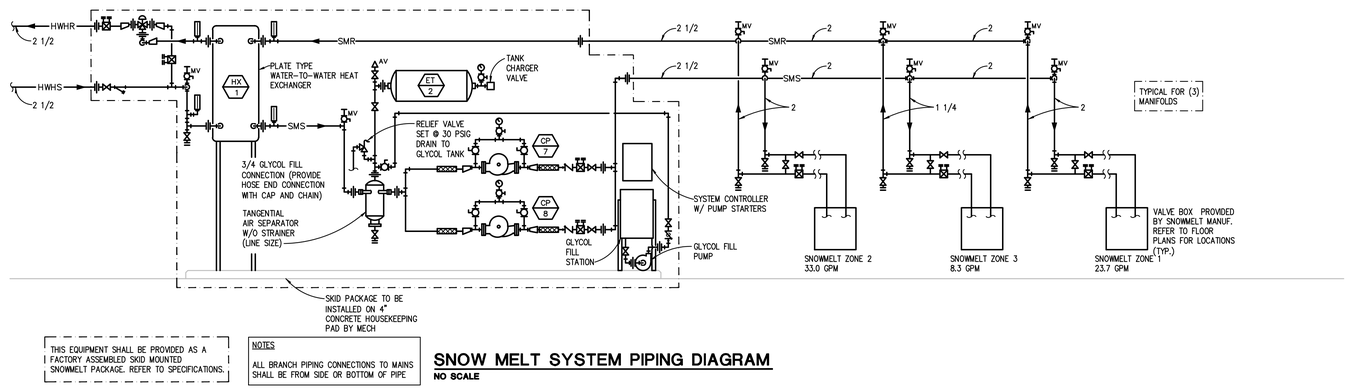


BUILDING CONDENSING WATER HEATERS WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM

NO SCALE



SNOW MELT SYSTEM MANIFOLD PIPING DIAGRAM



THIS EQUIPMENT SHALL BE PROVIDED AS A FACTORY ASSEMBLED SKID MOUNTED SNOWMELT PACKAGE. REFER TO SPECIFICATIONS.

NOTES

ALL BRANCH PIPING CONNECTIONS TO MAINS SHALL BE FROM SIDE OR BOTTOM OF PIPE

SNOW MELT SYSTEM PIPING DIAGRAM

NO SCALE

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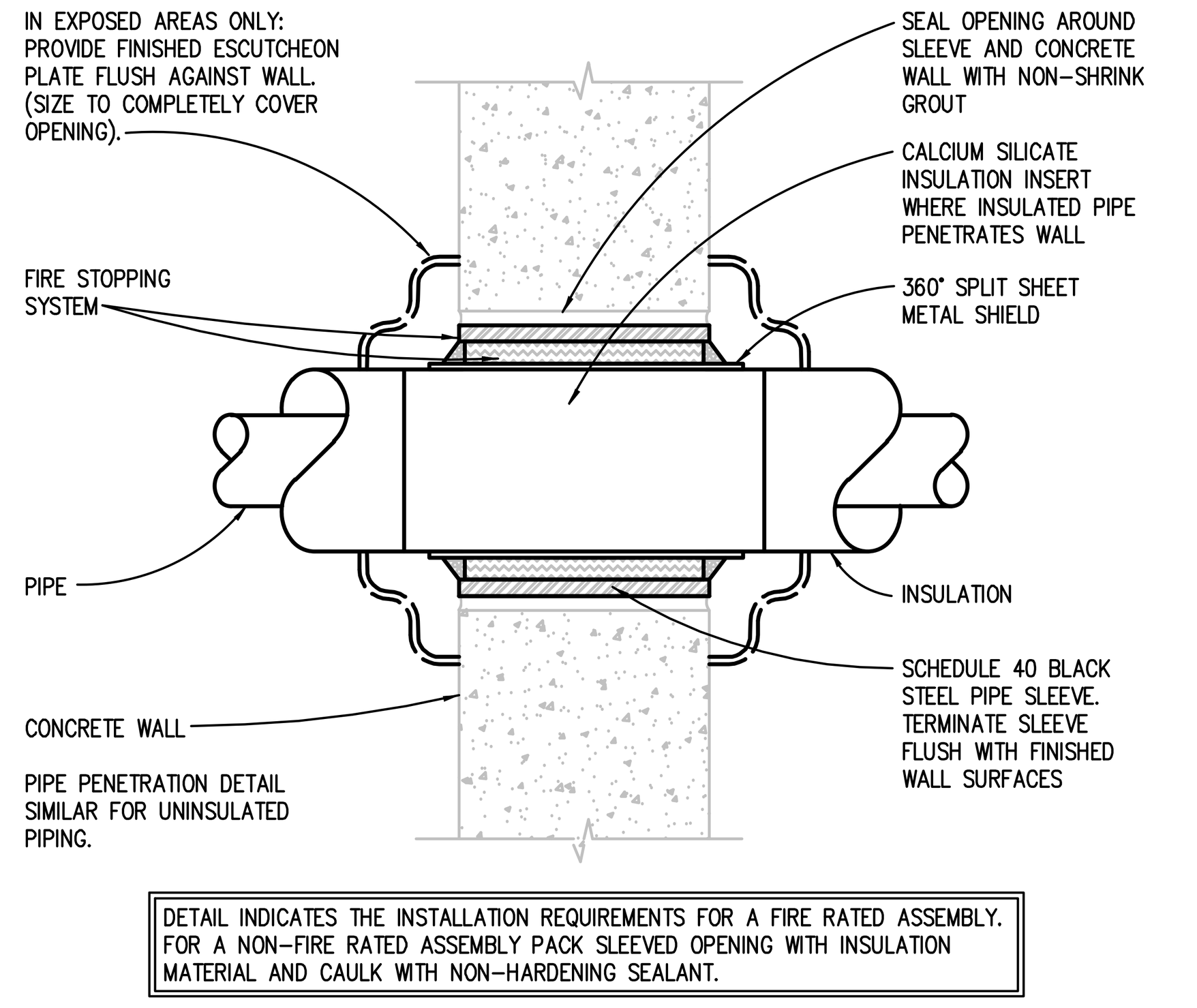
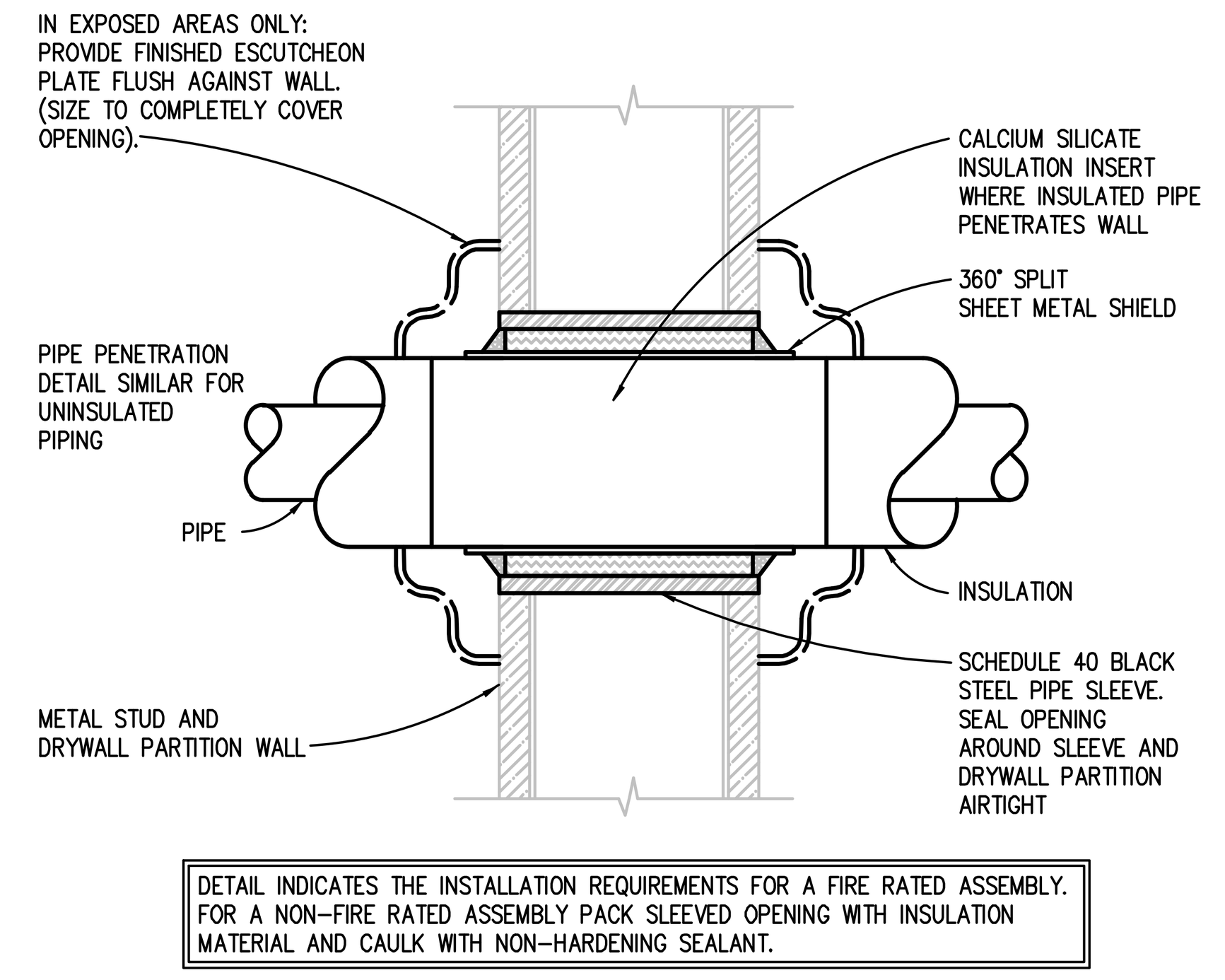
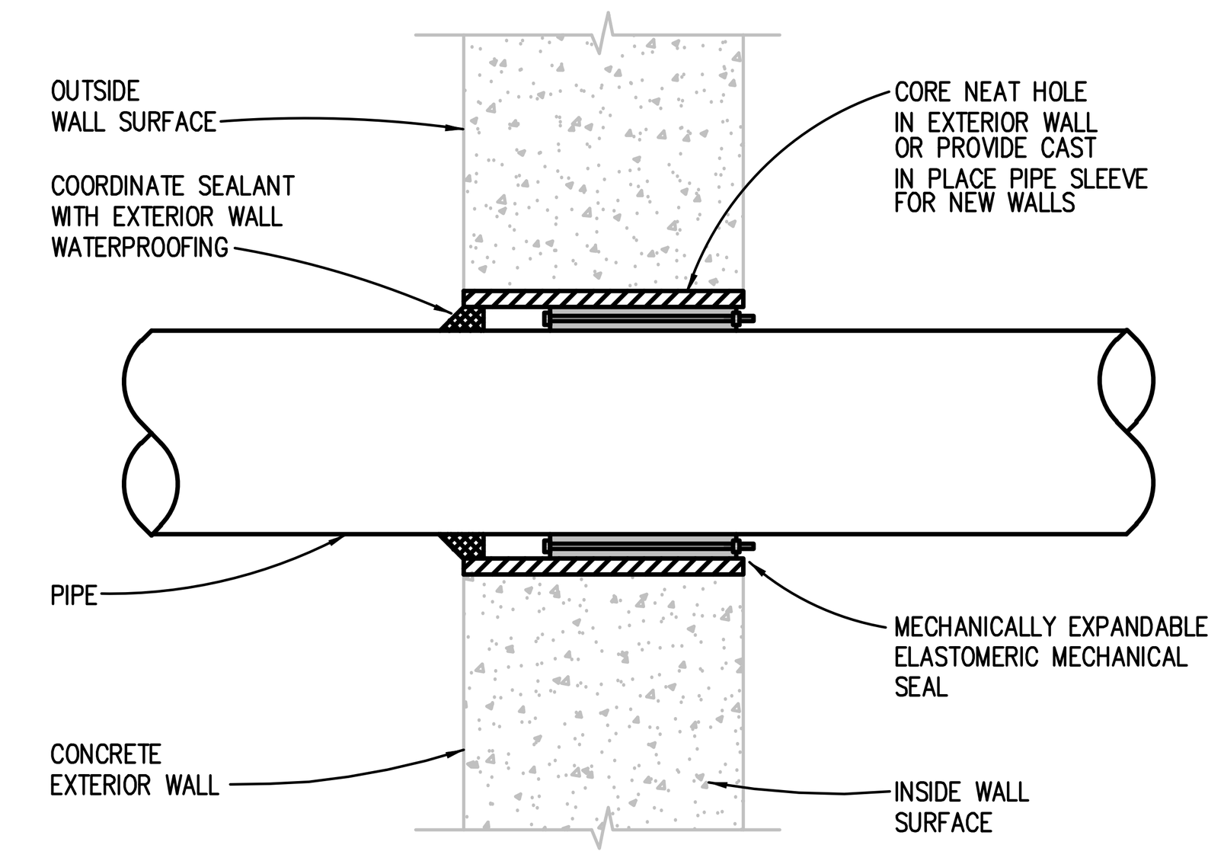


FIRE RATED AND NON-FIRE RATED POURED CONCRETE OR BLOCK WALL PIPE PENETRATION DETAIL
NO SCALE



FIRE RATED AND NON-FIRE RATED METAL STUD AND DRYWALL PARTITION WALL PIPE PENETRATION DETAIL
NO SCALE



EXTERIOR BELOW GRADE WALL PIPE PENETRATION DETAIL
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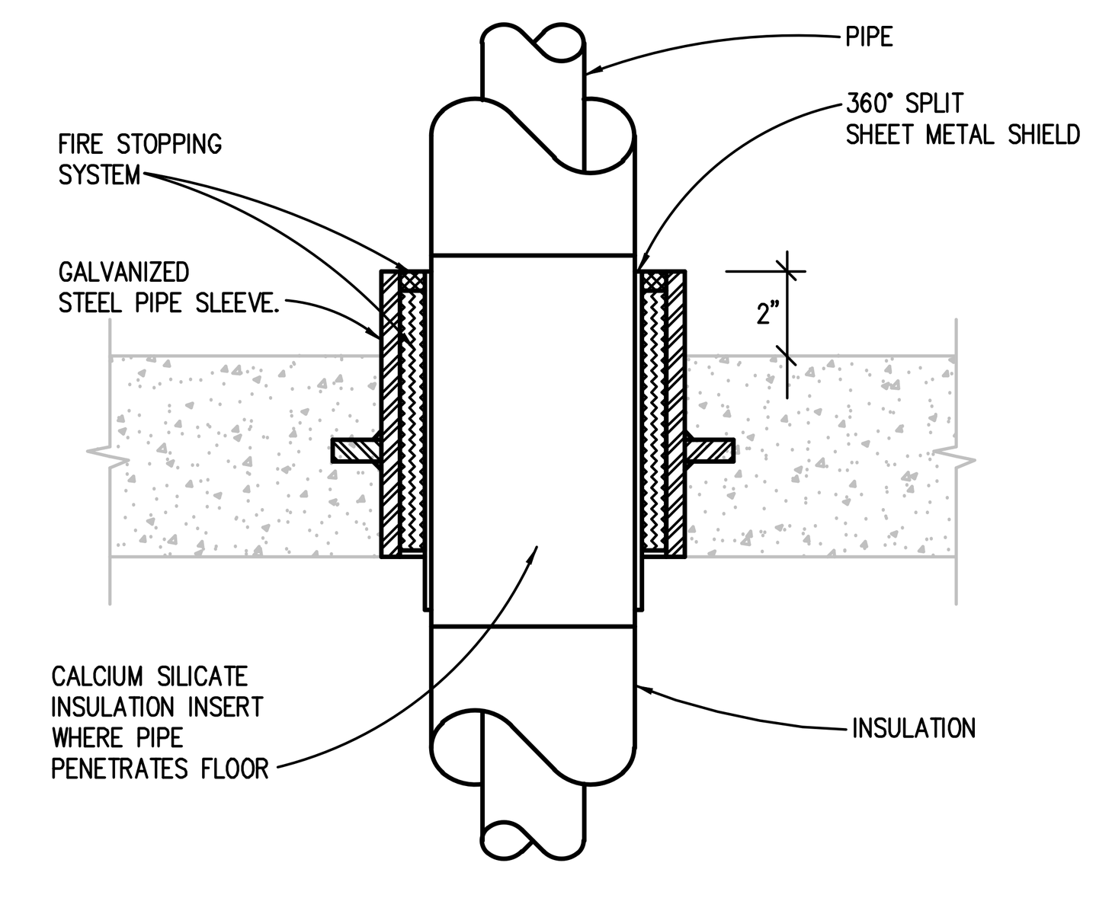
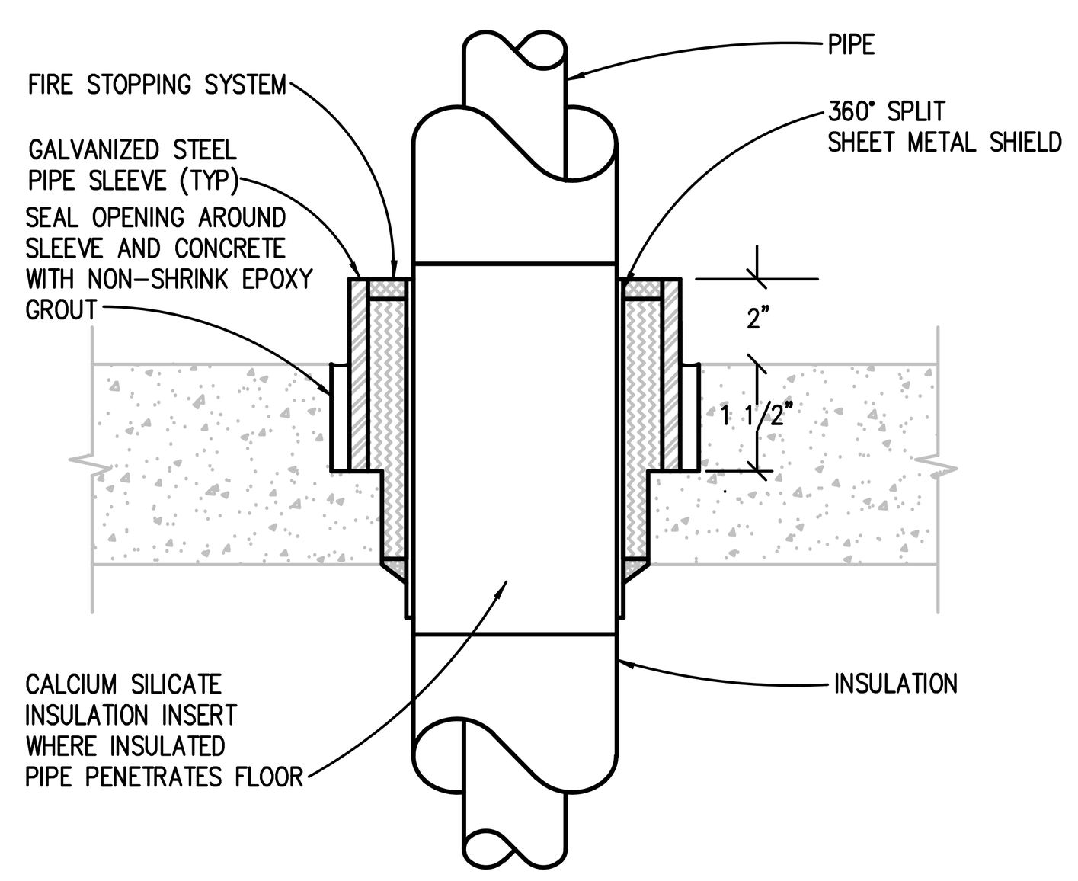


NEW FLOOR PIPE PENETRATION DETAIL
NO SCALE



EXISTING FLOOR PIPE PENETRATION DETAIL
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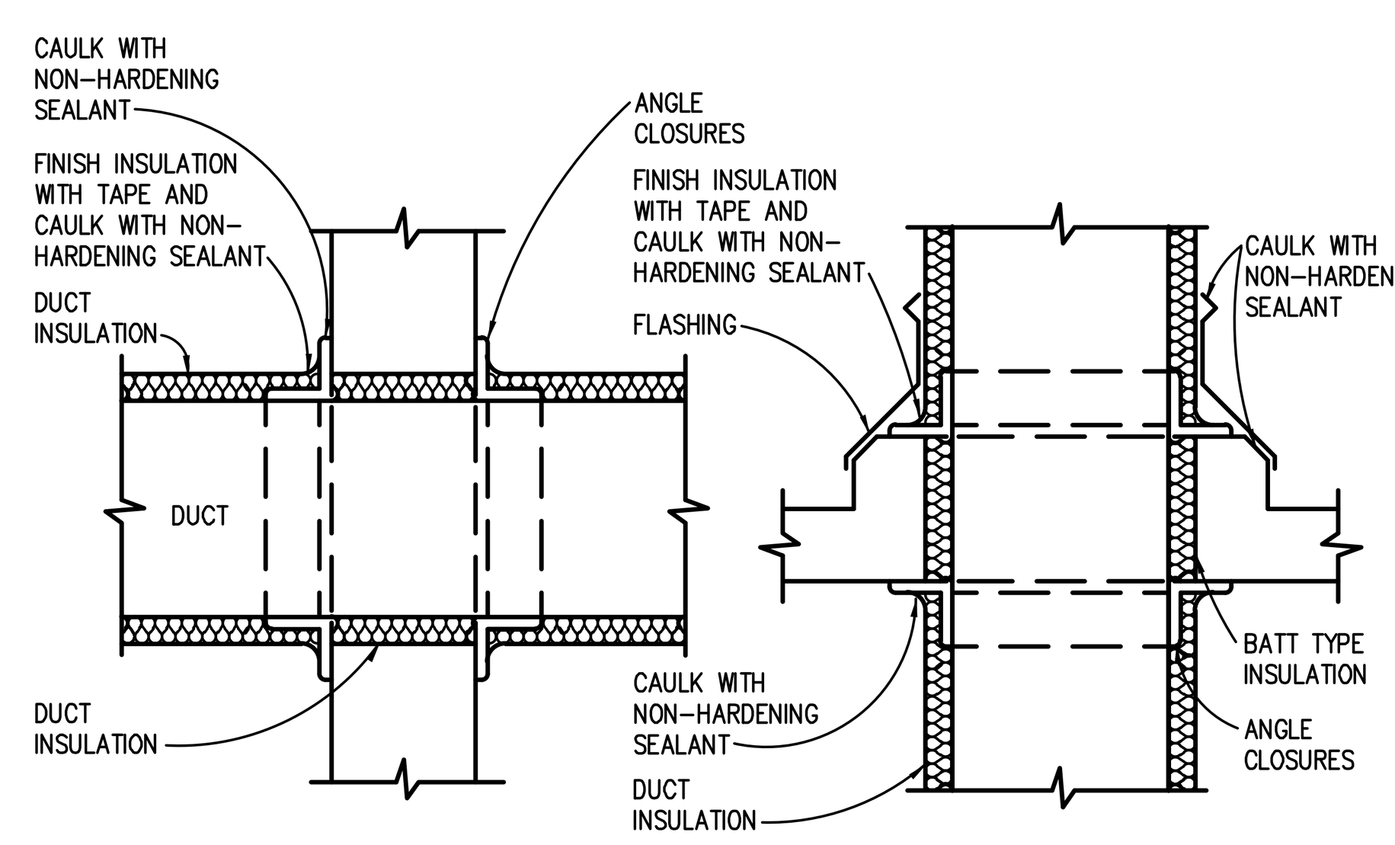

VERTICAL OR HORIZONTAL (NON FIRE RATED ASSEMBLY) DUCT PENETRATION DETAIL
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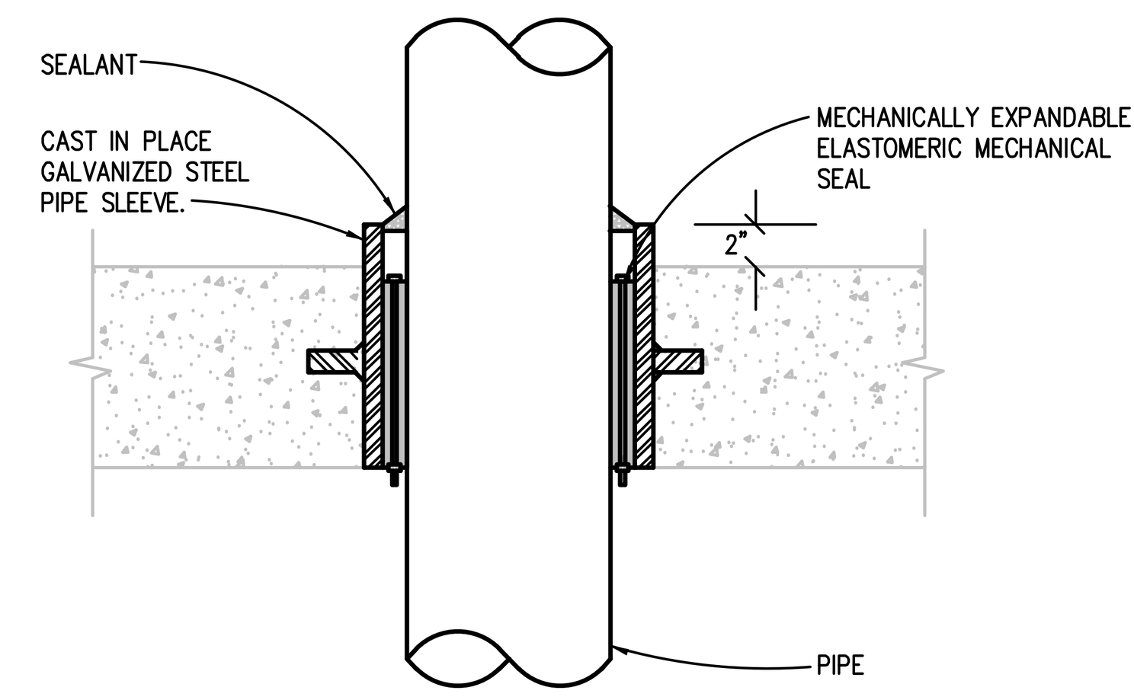

NEW SLAB ON GRADE FLOOR PIPE PENETRATION DETAIL
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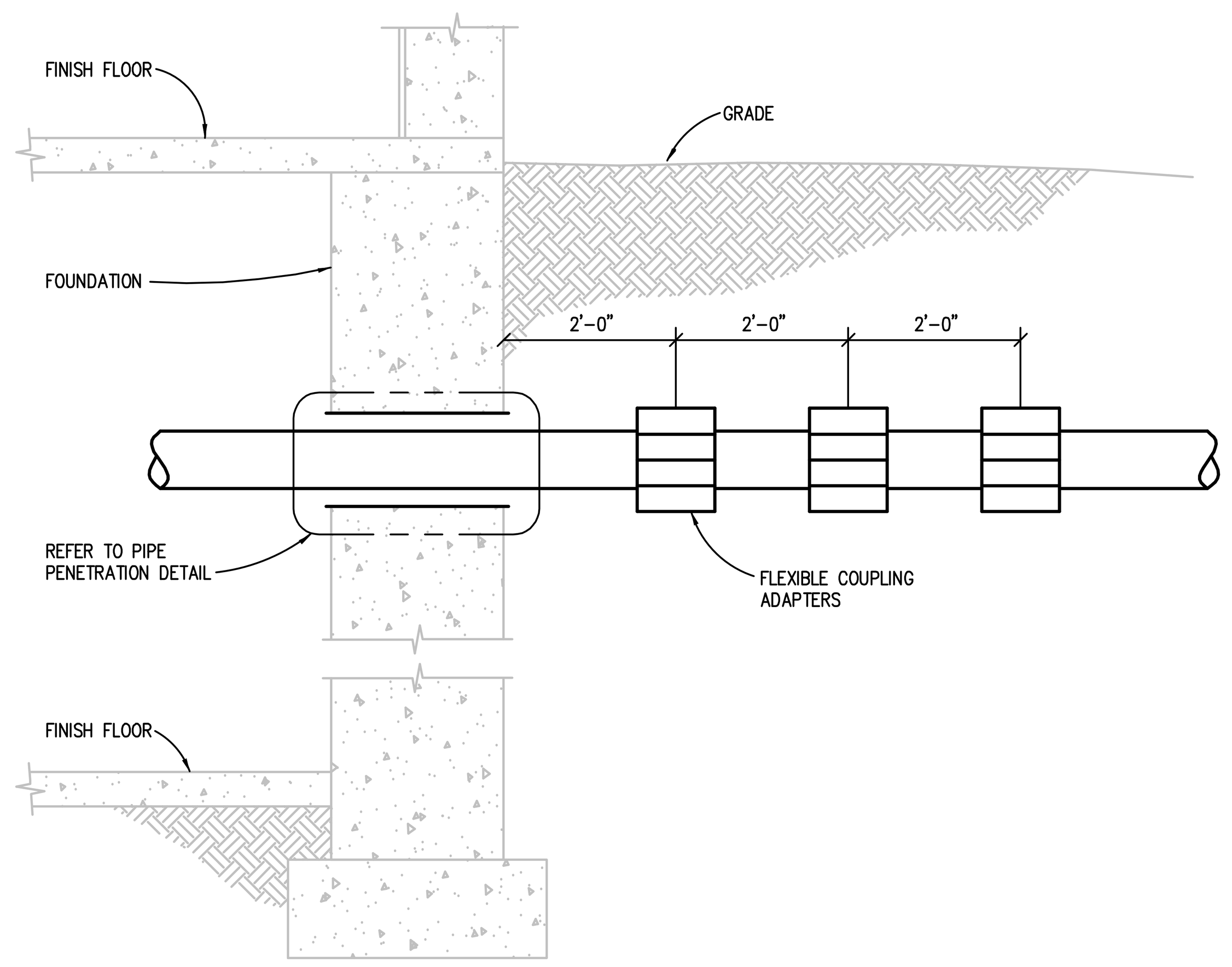
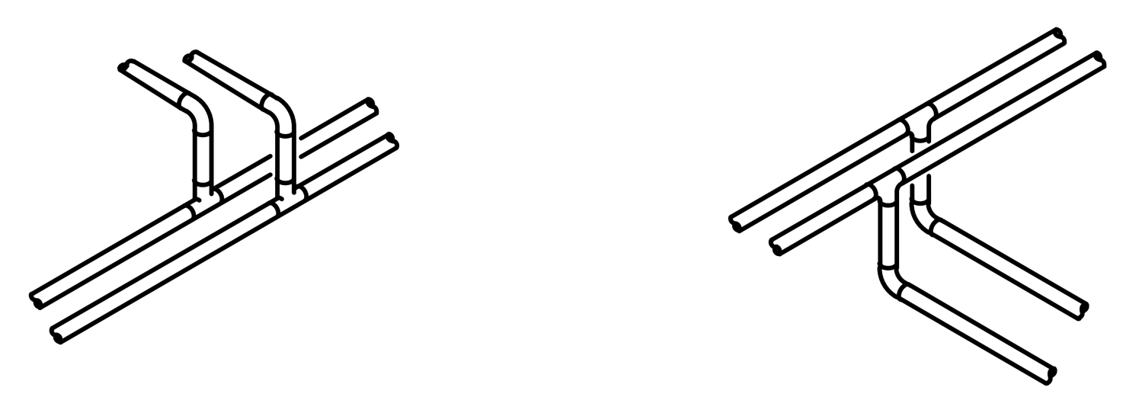


PIPE PENETRATION THROUGH FOUNDATION DETAIL
NO SCALE



BRANCH CONNECTION OFF TOP

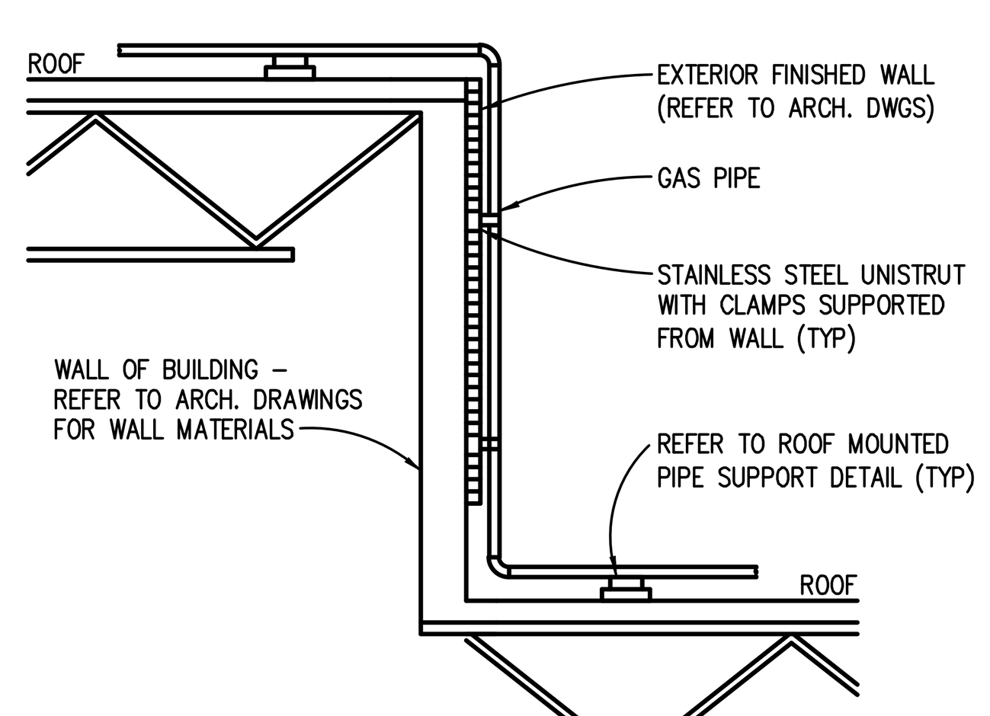
APPLIES TO THE FOLLOWING SYSTEMS:
DOMESTIC WATER
STEAM & CONDENSATE
LABORATORY GASES
LABORATORY VACUUM
COMPRESSED AIR
NATURAL GAS

BRANCH CONNECTION OFF BOTTOM

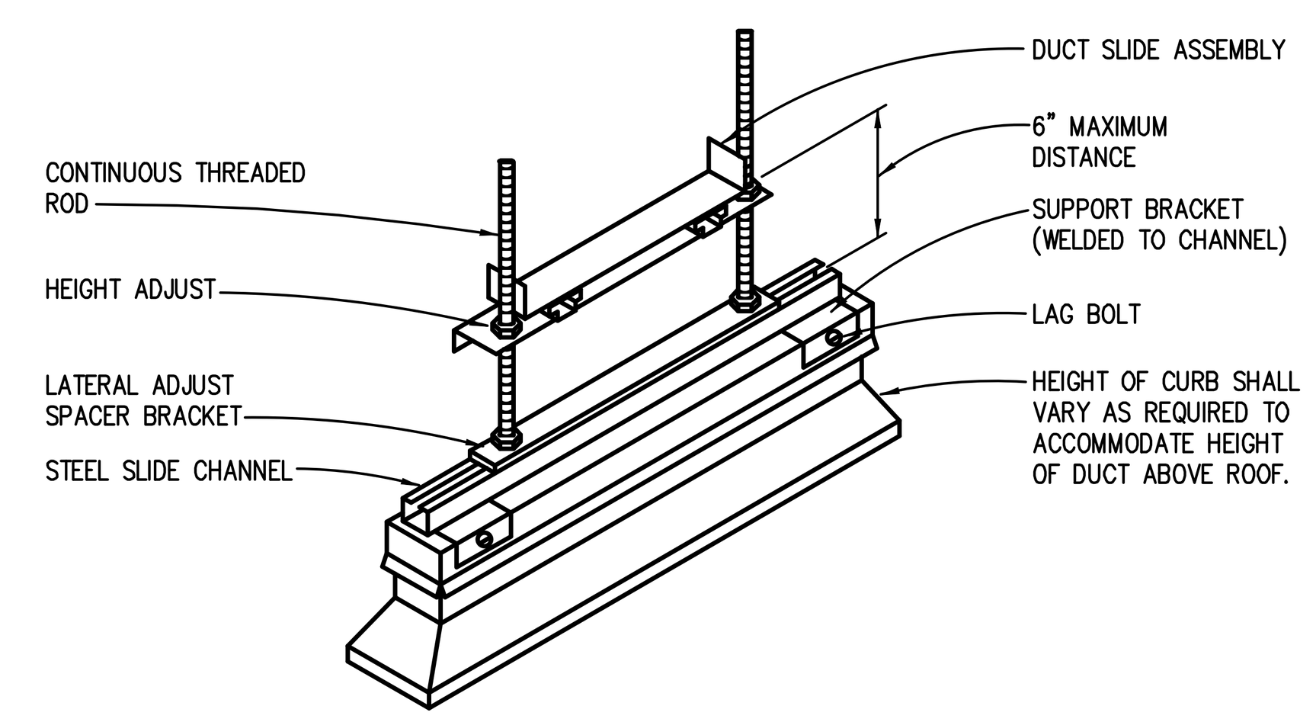
APPLIES TO THE FOLLOWING SYSTEMS:
HOT WATER HEATING
CHILLED WATER
CONDENSER WATER
ENERGY RECOVERY
PROCESS COOLING WATER

NOTE: BOTTOM AS INDICATED OR SIDE CONNECTION IS ACCEPTABLE. CONNECTION ABOVE CENTERLINE OF MAINS IS NOT ACCEPTABLE.

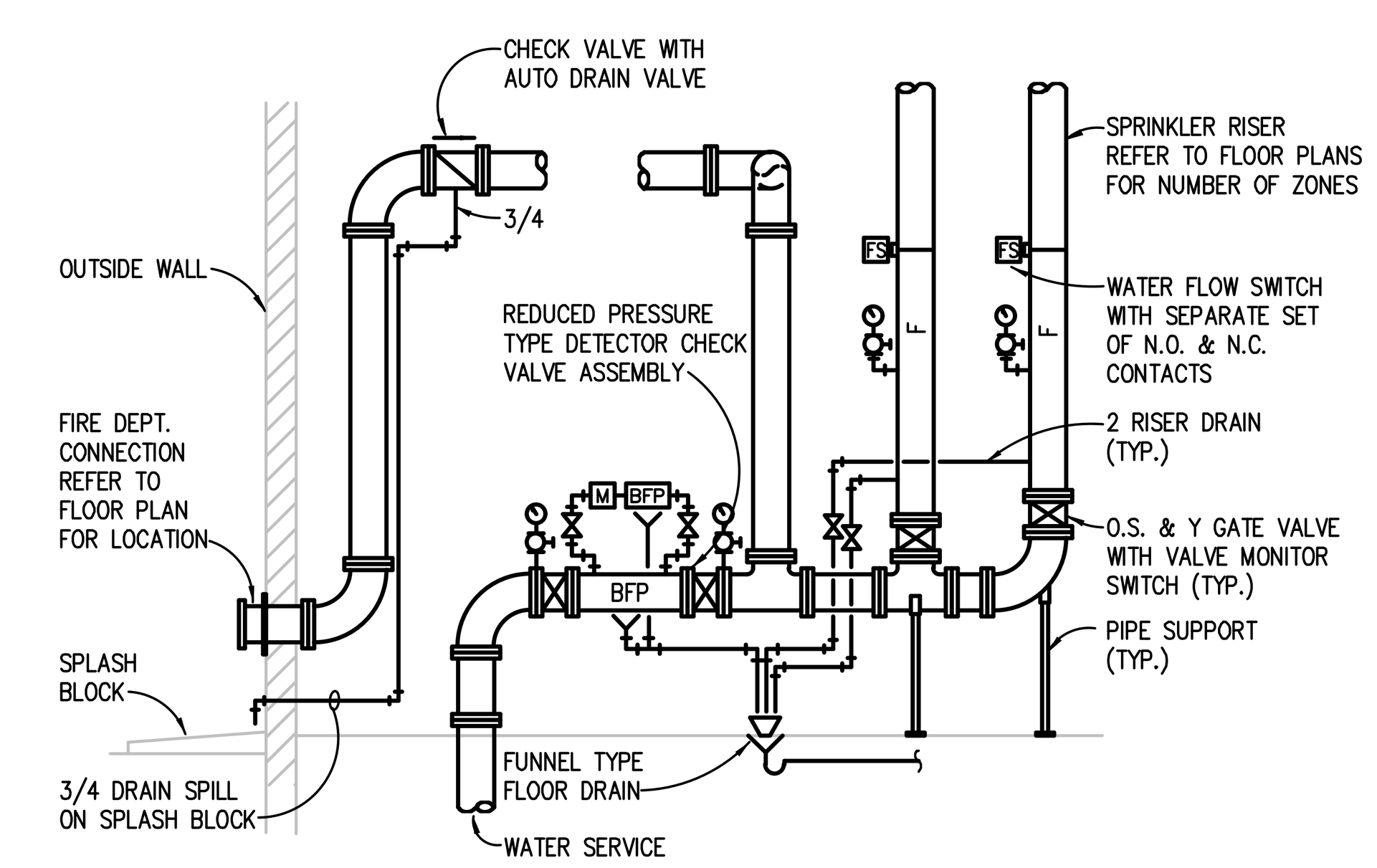
TYPICAL BRANCH TAKE-OFF CONNECTION PIPING DETAIL
NO SCALE



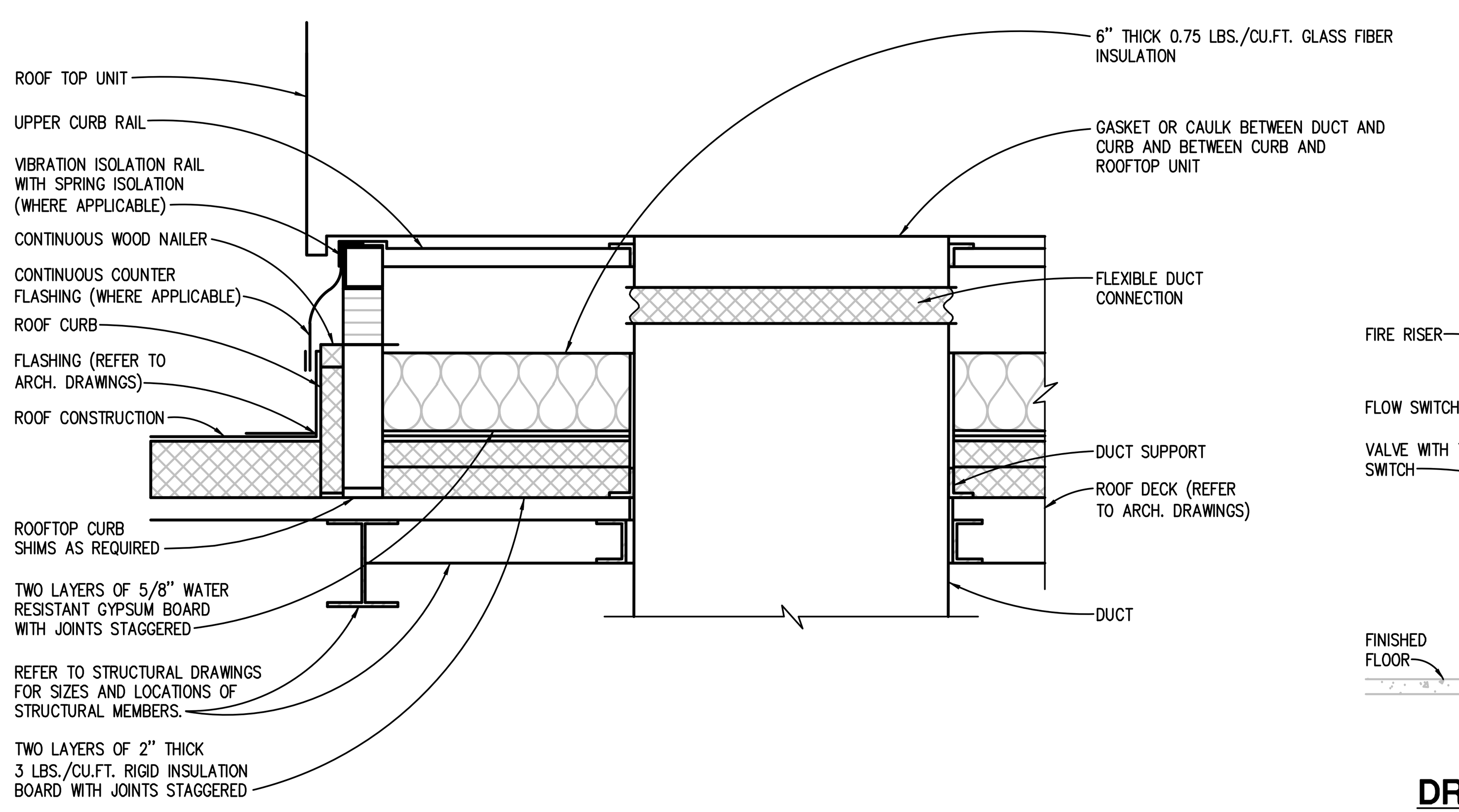
GAS PIPE MOUNTING DETAIL
NO SCALE



DUCT MOUNTING PEDESTAL DETAIL (ROOF MOUNTED DUCTWORK)
NO SCALE

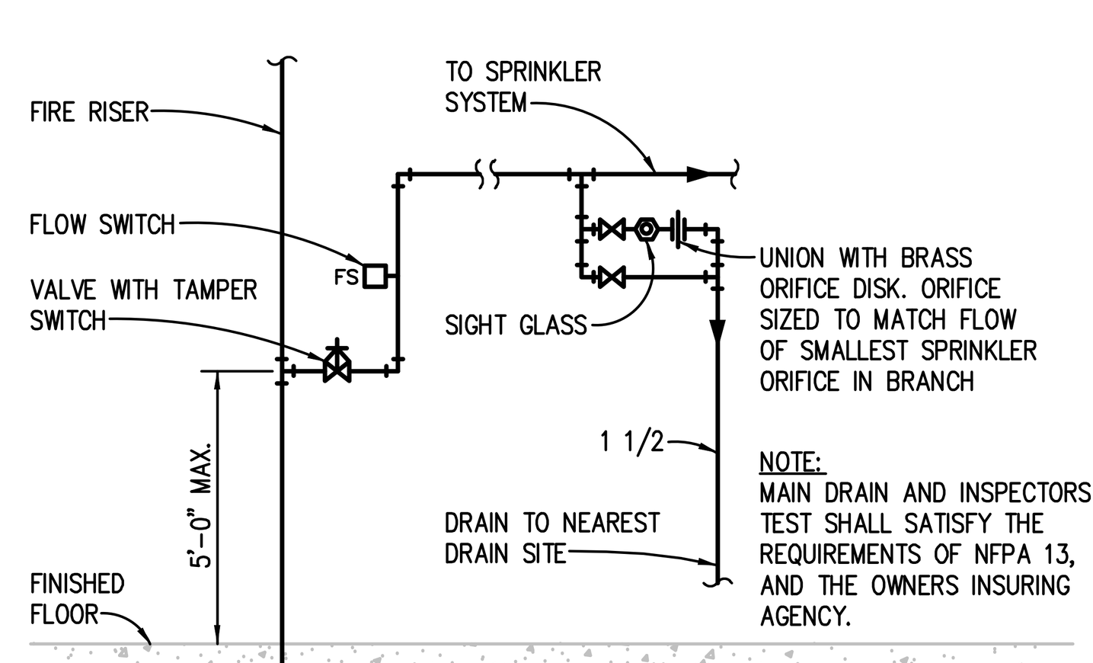


AUTOMATIC SPRINKLER RISER PIPING DIAGRAM
NO SCALE



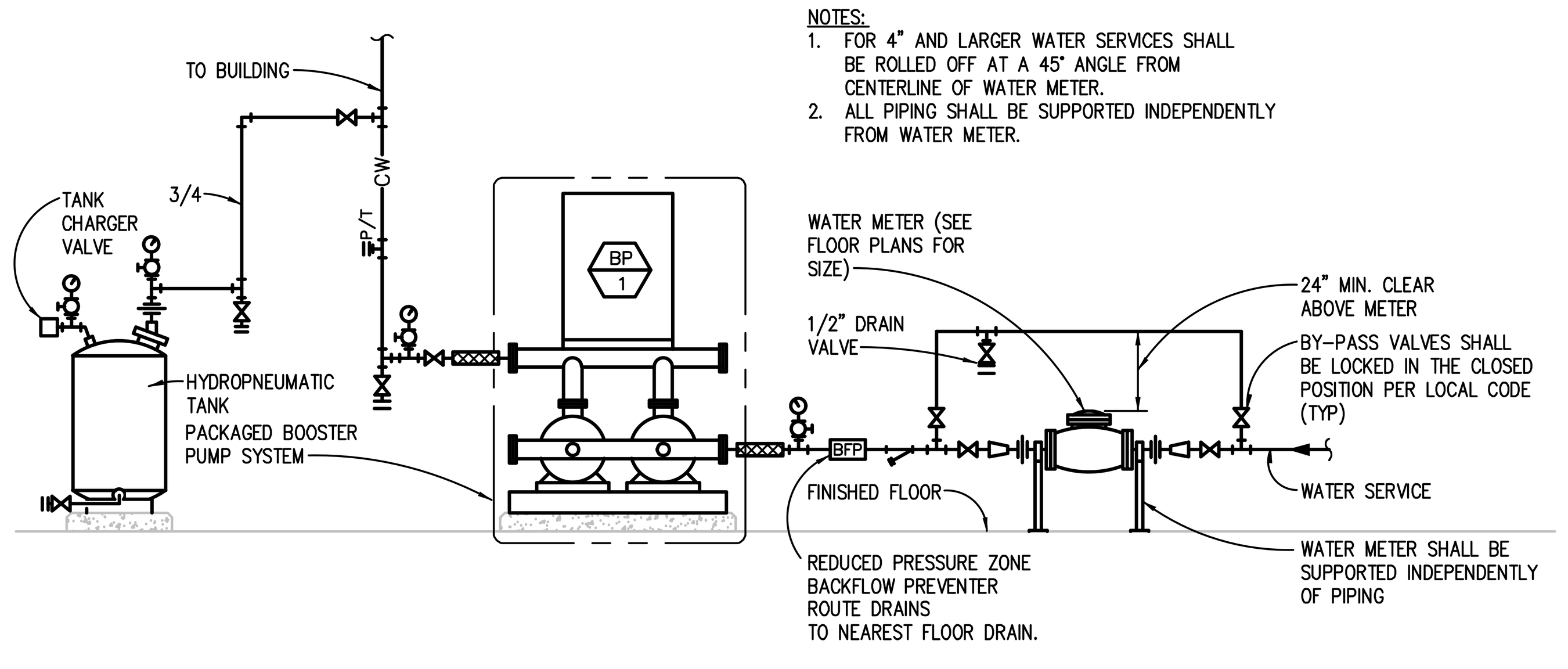
NOTE:
1. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR SPECIFIC FLASHING AND SUPPORT DETAILS.

ROOF TOP UNIT CURB SOUND ATTENUATION DETAIL
NO SCALE

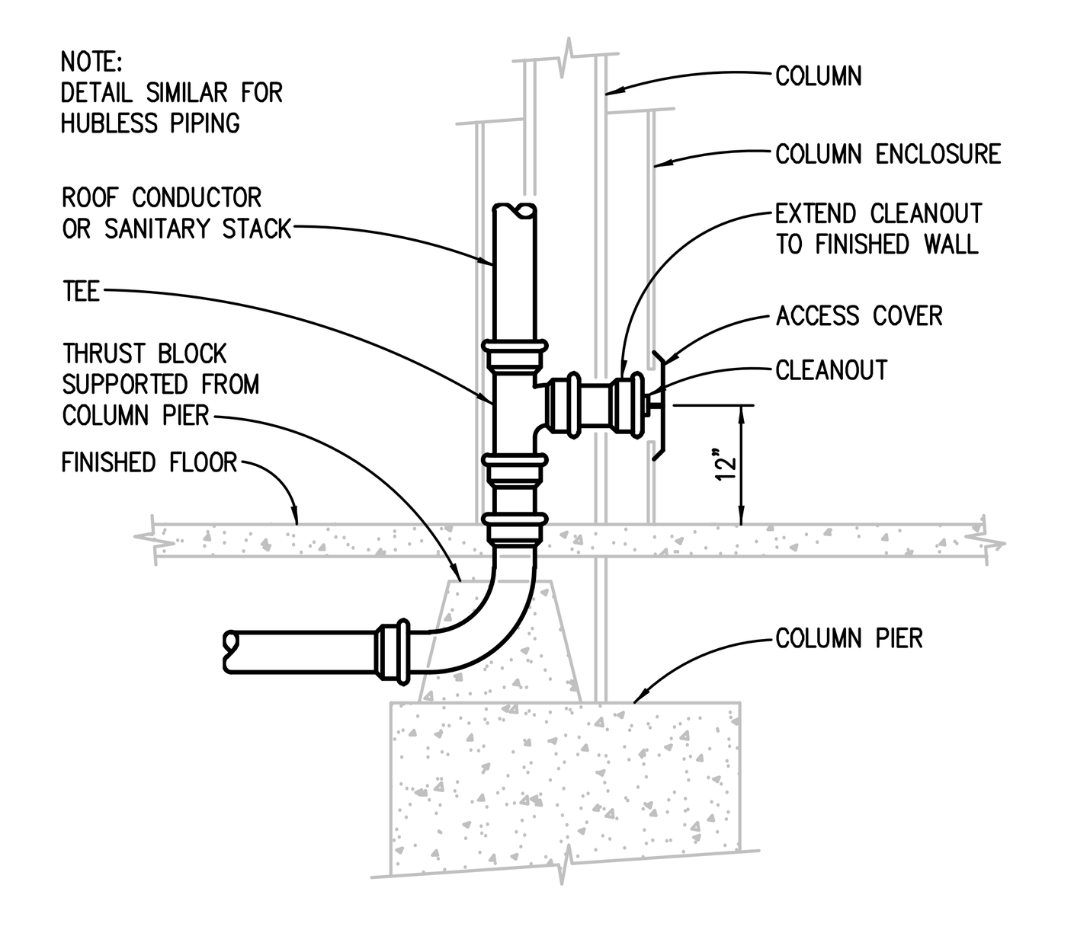


DRAIN/INSPECTORS TEST DETAIL
NO SCALE

NOTES:
1. FOR 4" AND LARGER WATER SERVICES SHALL BE ROLLED OFF AT A 45° ANGLE FROM CENTERLINE OF WATER METER.
2. ALL PIPING SHALL BE SUPPORTED INDEPENDENTLY FROM WATER METER.



DOMESTIC WATER METER AND BOOSTER PUMP PIPING DIAGRAM
NO SCALE



ROOF CONDUCTOR AND SANITARY STACK BASE CONNECTION DETAIL
NO SCALE

TMP ARCHITECTURE
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PBA Project No.: 2019-0237

PROJECT TITLE
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1735 South Wagner Road
Ann Arbor, Michigan

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DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

PROJECT NO.
19040

DRAWING NO.
M6.3-BP3

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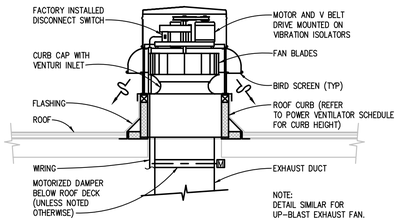
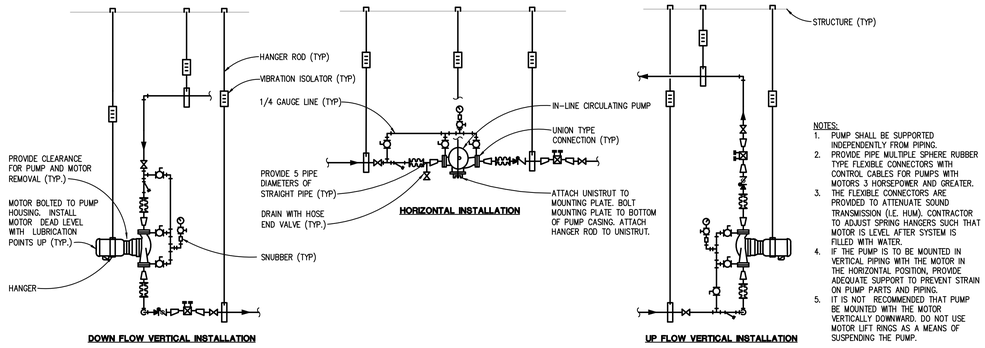


ROOF MOUNTED POWER VENTILATOR EXHAUST FAN DETAIL

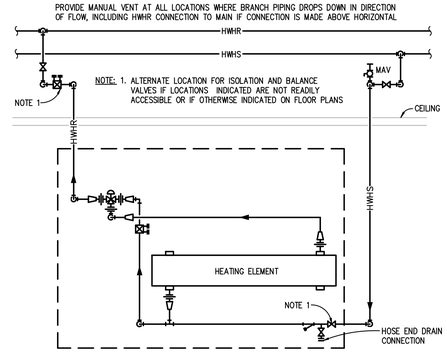
NO SCALE



NOTES:
1. PUMP SHALL BE SUPPORTED INDEPENDENTLY FROM PIPING.
2. PROVIDE PIPE MULTIPLE SPHERE RUBBER TYPE FLEXIBLE CONNECTORS WITH CONTROL CABLES FOR PUMPS WITH MOTORS 3 HORSEPOWER AND GREATER.
3. THE FLEXIBLE CONNECTORS ARE PROVIDED TO ATTENUATE SOUND TRANSMISSION (I.E. HUM). CONTRACTOR TO ADJUST SPRING HANGERS SUCH THAT MOTOR IS LEVEL AFTER SYSTEM IS FILLED WITH WATER.
4. IF THE PUMP IS TO BE MOUNTED IN VERTICAL PIPING WITH THE MOTOR IN THE HORIZONTAL POSITION, PROVIDE ADEQUATE SUPPORT TO PREVENT STRAIN ON PUMP PARTS AND PIPING.
5. IT IS NOT RECOMMENDED THAT PUMP BE MOUNTED WITH THE MOTOR VERTICALLY DOWNWARD. DO NOT USE MOTOR LIFT RINGS AS A MEANS OF SUSPENDING THE PUMP.

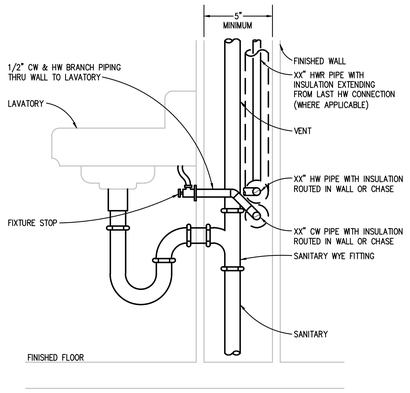
IN-LINE CLOSE COUPLED (BELL AND GOSSETT SERIES 80 AND 90) TYPE CIRCULATING PUMP PIPING DIAGRAM

NO SCALE



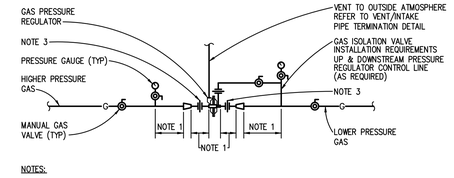
DOWNFEED CONV. OR CUH WITH THREE WAY CONTROL VALVE PIPING DIAGRAM

NO SCALE



TYPICAL LAVATORY DETAIL

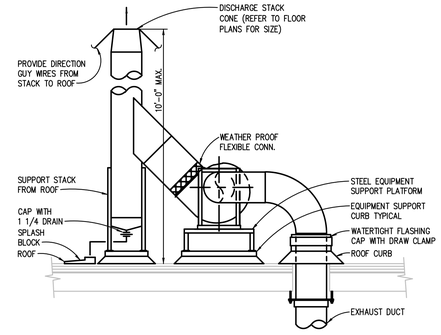
NO SCALE



NOTES:
1. PROVIDE STRAIGHT LENGTHS OF PIPING UPSTREAM AND DOWNSTREAM OF ALL COMPONENTS AS REQUIRED BY MANUFACTURER OF GAS PRESSURE REGULATOR PROVIDED.
2. VENT PIPING MATERIAL SHALL BE THE SAME AS THE GAS PIPING MATERIAL.
3. OMIT UNIONS WHERE CONNECTIONS ARE FLANGED.

GAS PRESSURE REGULATOR PIPING DETAIL

NO SCALE

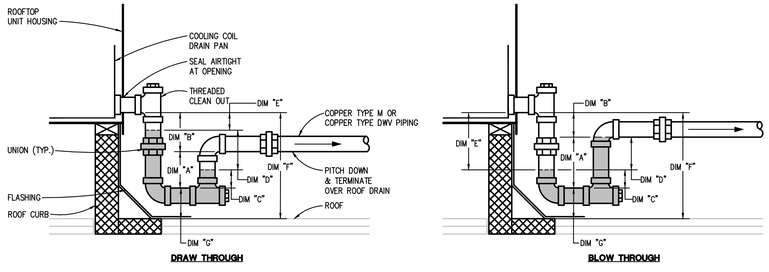


ROOF EXHAUST FAN AND STACK DETAIL

NO SCALE

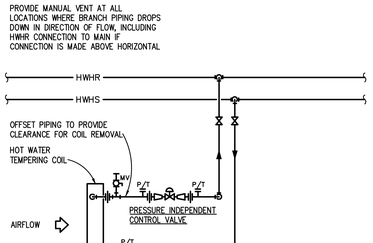
TRAP DIMENSION TABLE										
TYPE OF SYSTEM	S.P. AT COIL DRAIN PAN (IN.) (NOTE A)	DIMENSION "A" (INCHES) MIN.	DIMENSION "B" (INCHES)	DIMENSION "C" (INCHES) (TRAP SEAL)	DIMENSION "D" (INCHES)	DIMENSION "E" (INCHES)	DIMENSION "F" (INCHES) DRAIN PIPE SIZE (INCHES)			
							1 1/2	2	2 1/2, 3	4
DRAW THROUGH	-5.1 TO -6	5.0	5.0	2	6	2	13.0	14.0	15.0	16.0
	-4.1 TO -5	4.5	4.5	2	5	2	12.0	13.0	14.0	15.0
	-3.1 TO -4	4.0	4.0	2	4	2	11.0	12.0	13.0	14.0
	-2.1 TO -3	3.5	3.5	2	3	2	10.0	11.0	12.0	13.0
	UP TO -2	3.0	3.0	2	2	2	9.0	10.0	11.0	12.0
BLOW THROUGH	UP TO +2	4.0	2.0	2	2	4	9.0	10.0	11.0	12.0
	+2.1 TO +3	5.0	2.0	2	3	5	10.0	11.0	12.0	13.0
	+3.1 TO +4	6.0	2.0	2	4	6	11.0	12.0	13.0	14.0
	+4.1 TO +5	7.0	2.0	2	5	7	12.0	13.0	14.0	15.0
	+5.1 TO +6	8.0	2.0	2	6	8	13.0	14.0	15.0	16.0

NOTES: A. REFER TO ROOFTOP AIR HANDLING UNIT (COMMERCIAL, UNITARY, MODULAR) SCHEDULE FOR (-) OR (+) STATIC PRESSURE AT COIL DRAIN PAN.
B. ENERGY RECOVERY UNIT HEAT EXCHANGER CONDENSATE PAN TRAP PIPING OUTSIDE CASING SHALL BE INSULATED AND HEAT TRACED.
C. DIMENSION "C" IS MIN: 3" FOR UP TO 1 1/2" DRAIN PIPE
4" FOR 2" DRAIN PIPE
5" FOR 2 1/2" OR 3" DRAIN PIPE
6" FOR 4" DRAIN PIPE
D. PROVIDE ROOF CURB WITH ADEQUATE HEIGHT TO MEET DIMENSION "F"



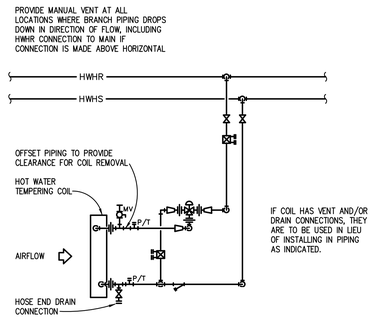
ROOFTOP AIR HANDLING UNIT CONDENSATE DRAIN PAN TRAP DETAIL

NO SCALE



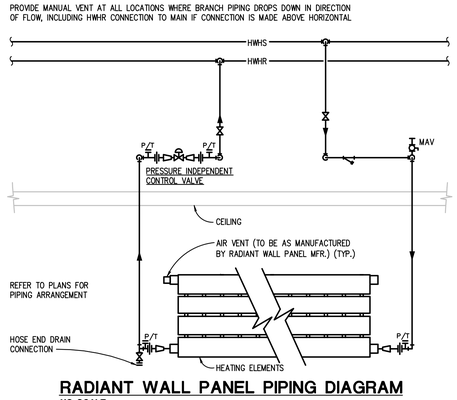
HOT WATER TEMPERING COIL WITH TWO-WAY CONTROL VALVE PIPING DIAGRAM

NO SCALE



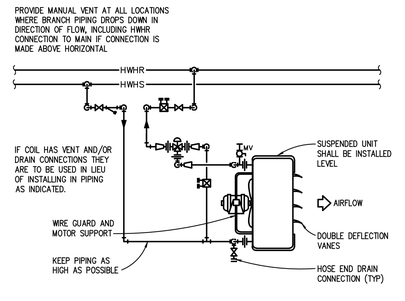
HOT WATER TEMPERING COIL WITH THREE-WAY CONTROL VALVE PIPING DIAGRAM

NO SCALE



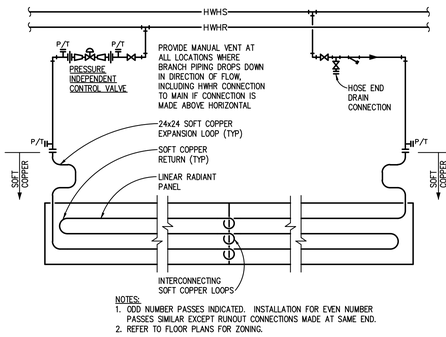
RADIANT WALL PANEL PIPING DIAGRAM

NO SCALE



HOT WATER UNIT HEATER WITH THREE-WAY CONTROL VALVE PIPING DIAGRAM

NO SCALE



NOTES:
1. ODD NUMBER PASSES INDICATED. INSTALLATION FOR EVEN NUMBER PASSES SIMILAR EXCEPT RUNOUT CONNECTIONS MADE AT SAME END.
2. REFER TO FLOOR PLANS FOR ZONING.

END FEED LINEAR RADIANT CEILING PANEL PIPING DIAGRAM

NO SCALE

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PBA Project No.: 2019-0237

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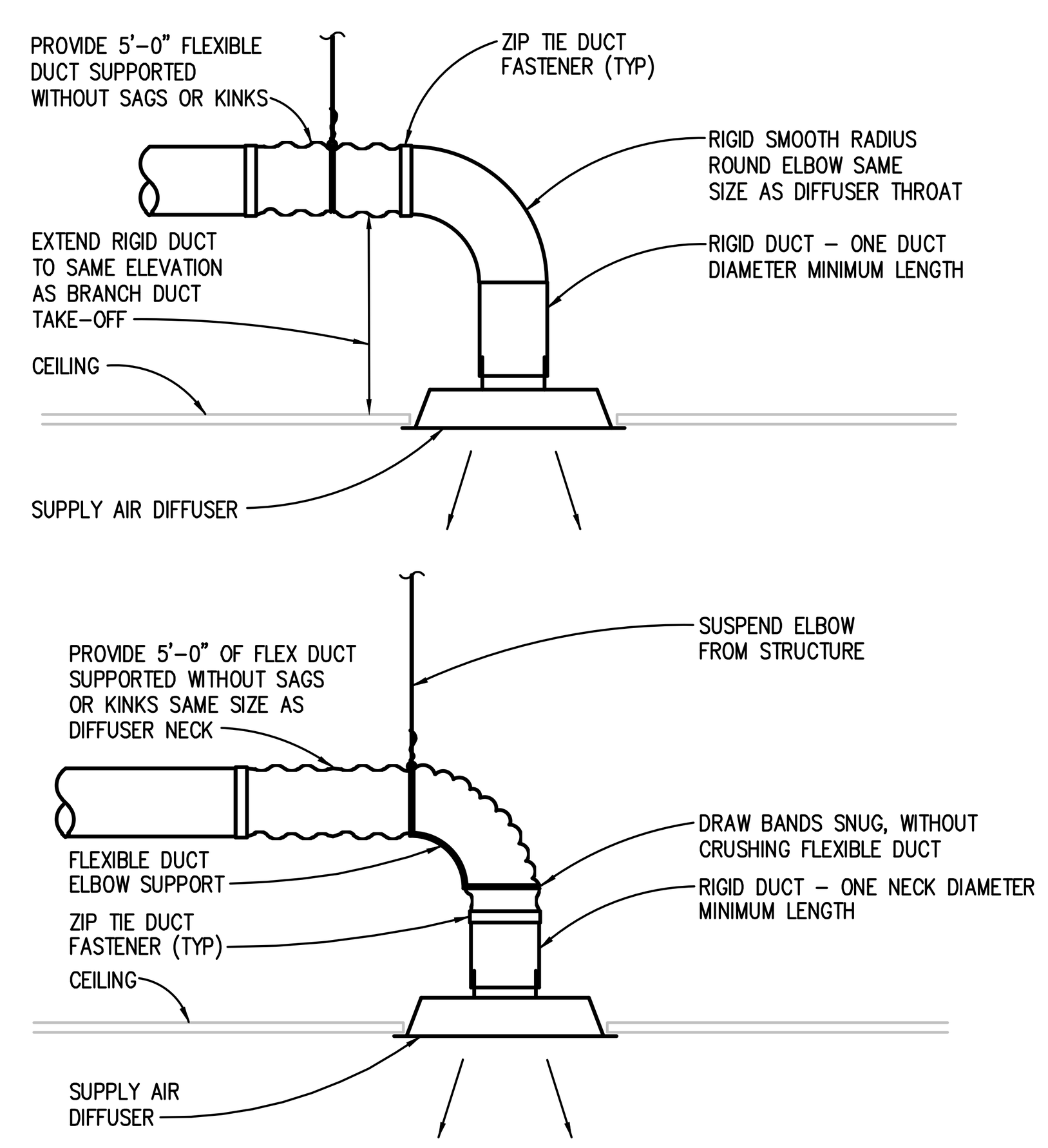
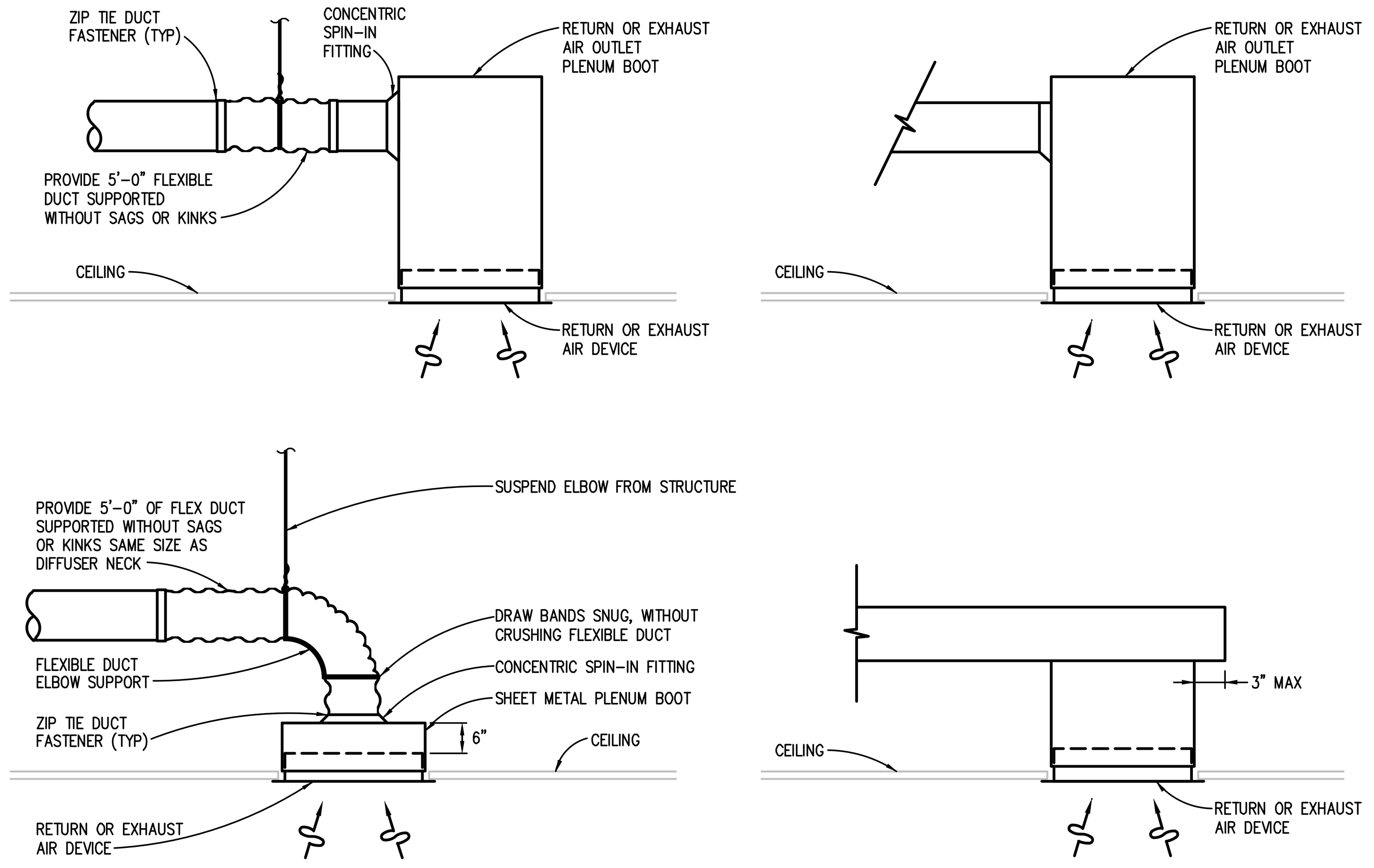
M6.4-BP3



ROUND NECK SUPPLY AIR DIFFUSER DETAIL

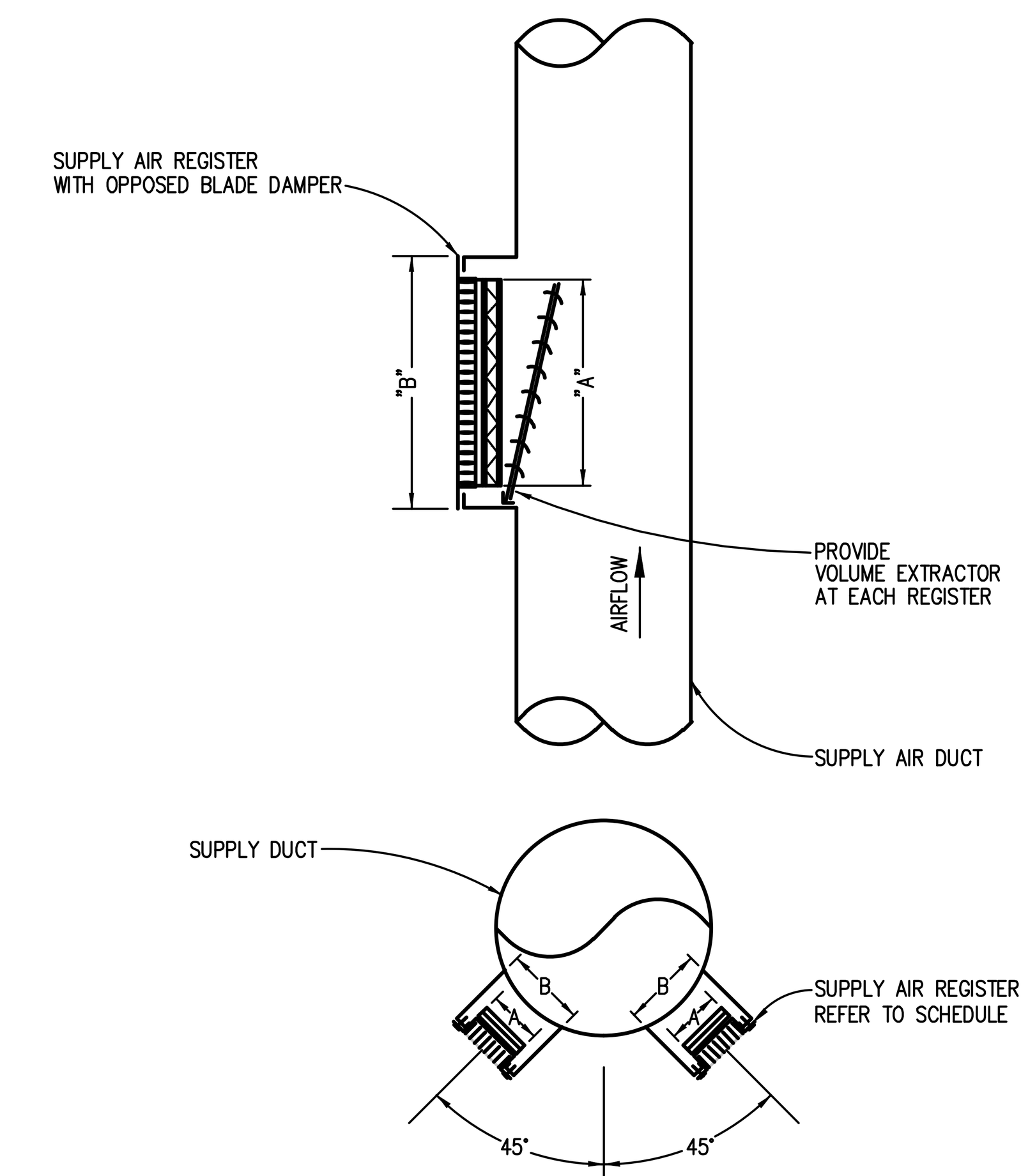
NO SCALE



RETURN OR EXHAUST AIR DEVICE INSTALLATION DETAIL

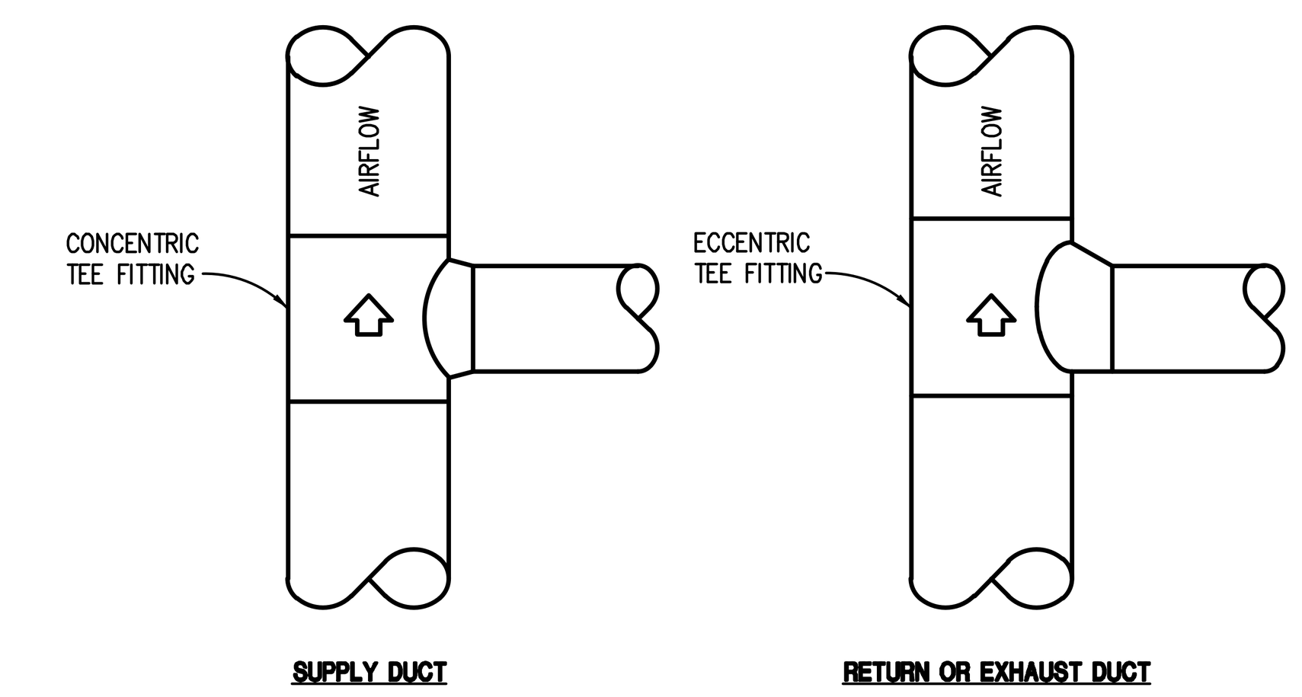
NO SCALE

NOTE: PAINT INTERIOR SURFACE OF PLENUM BOX FLAT BLACK.



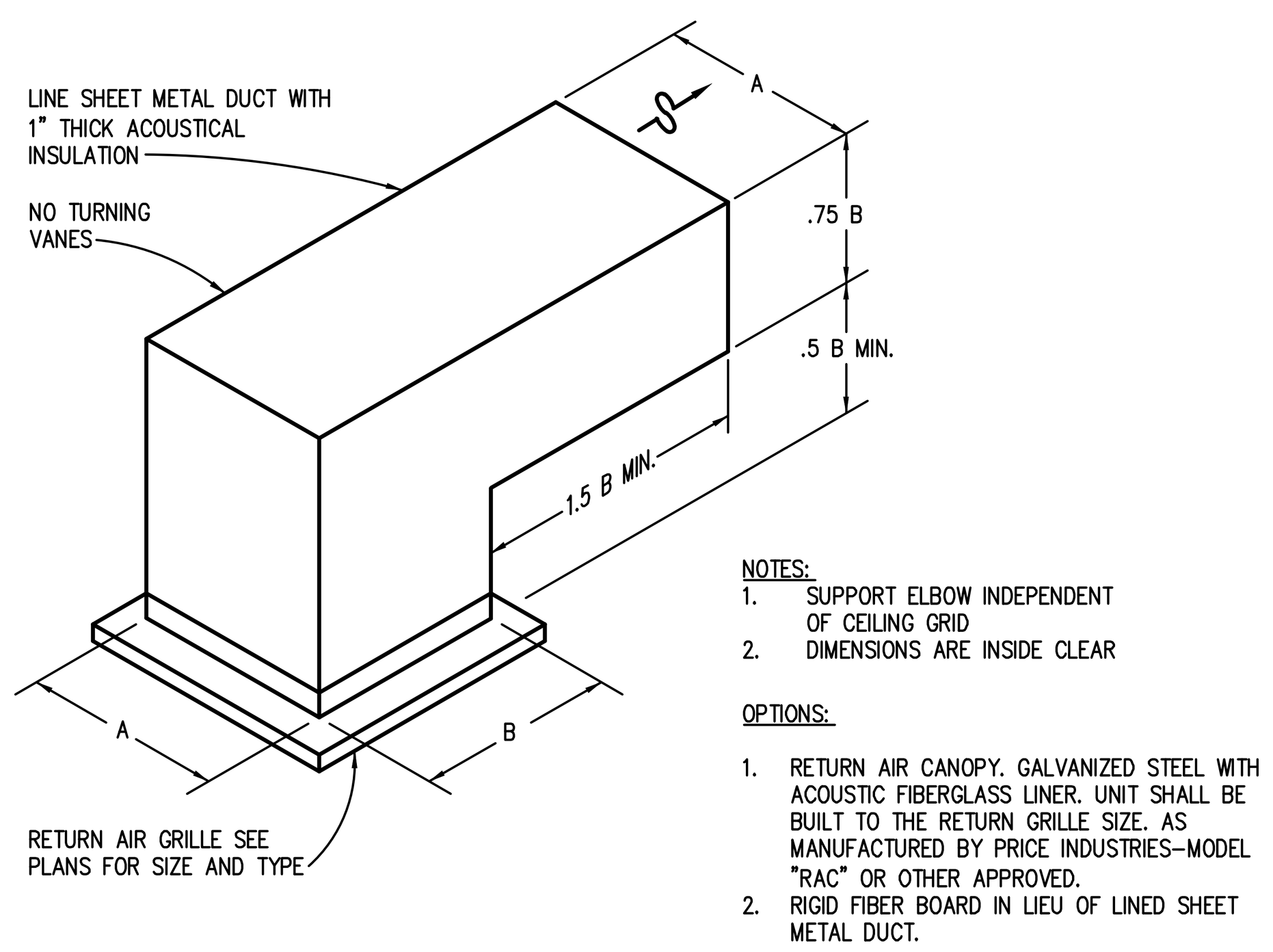
DUCT MOUNTED SUPPLY AIR REGISTER DETAIL

NO SCALE

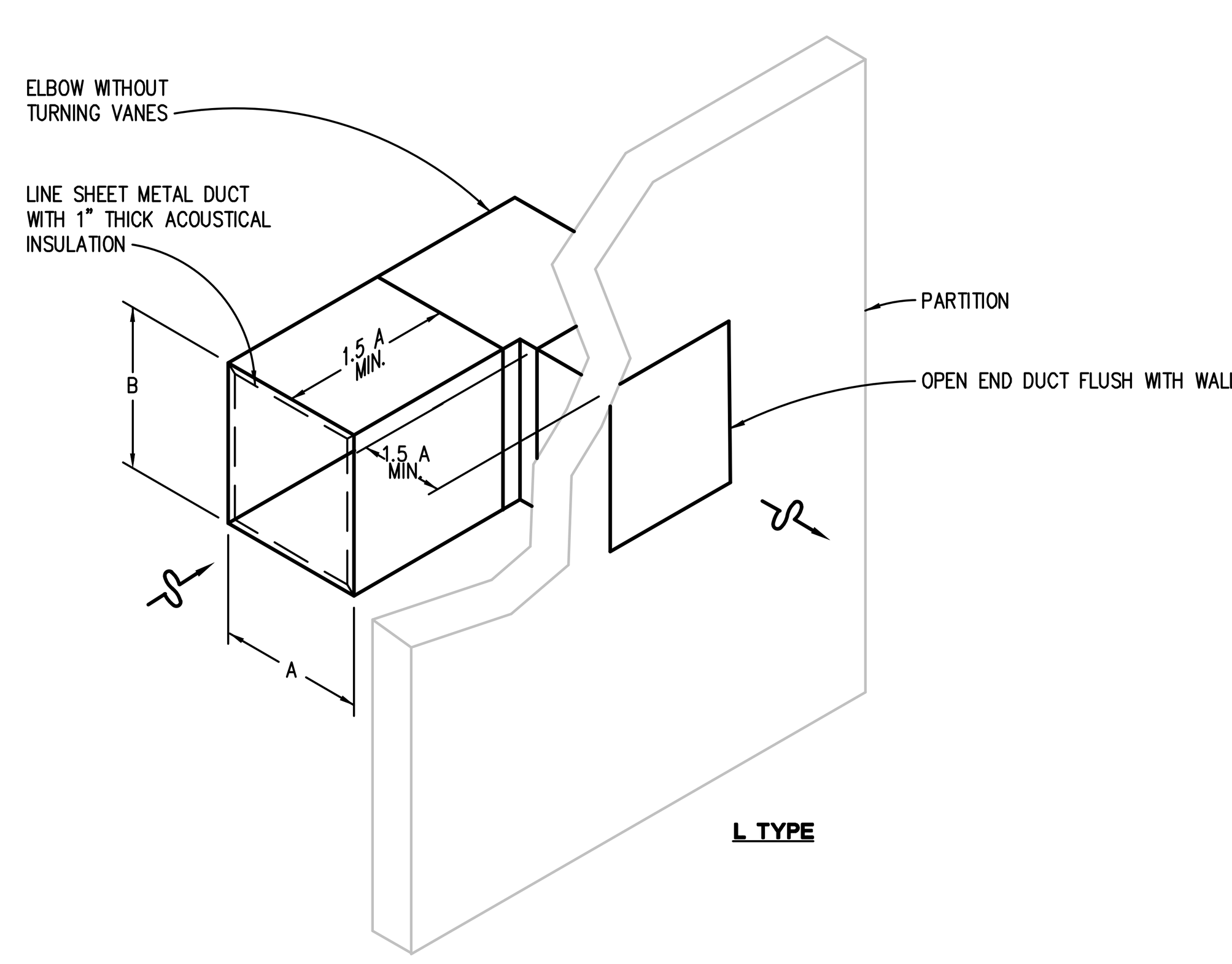


SPIRAL DUCT BRANCH TAKE-OFF DETAILS

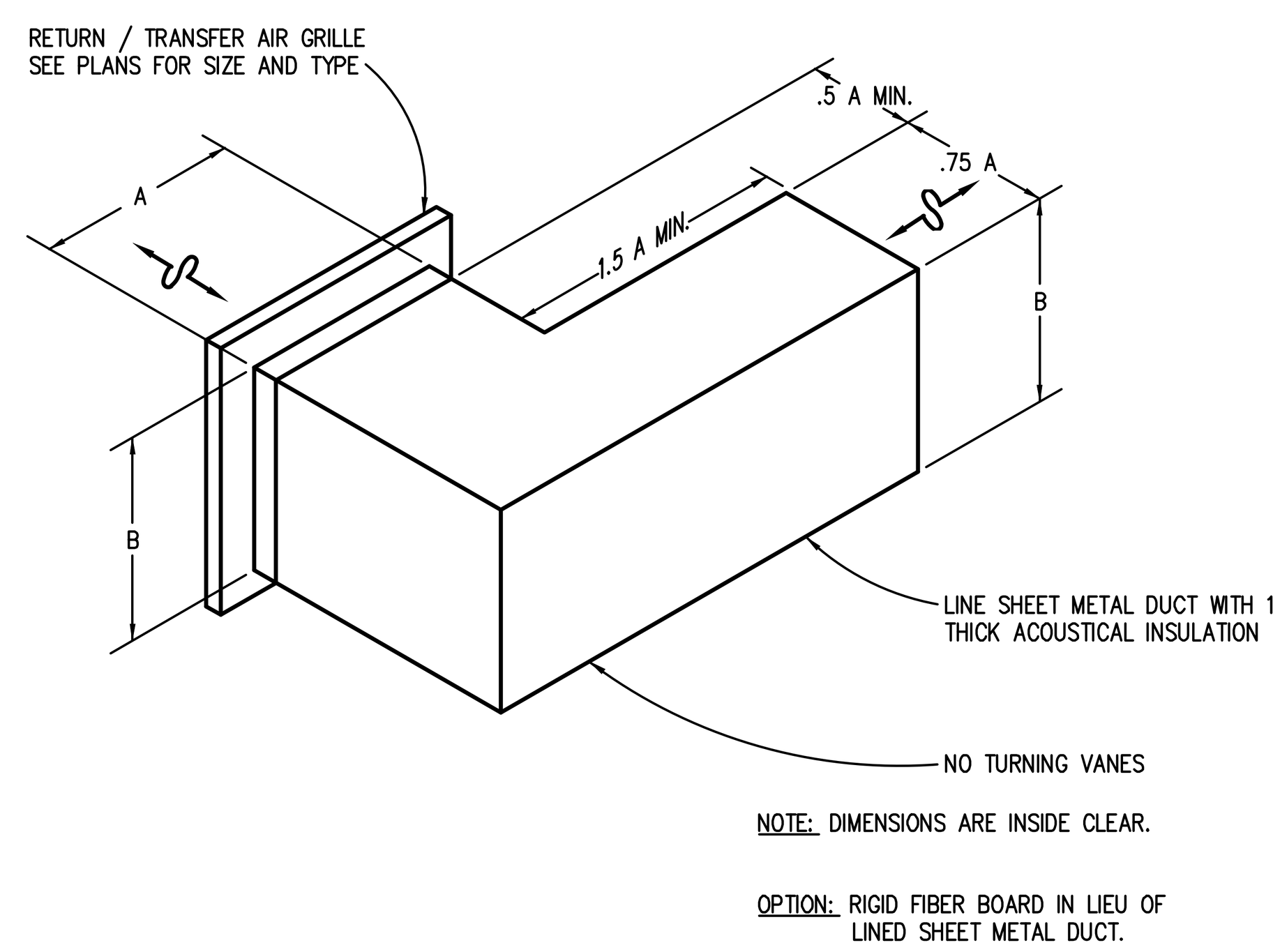
NO SCALE (ROUND AND FLAT OVAL SIMILAR)



CEILING GRILLE TO/FROM PLENUM



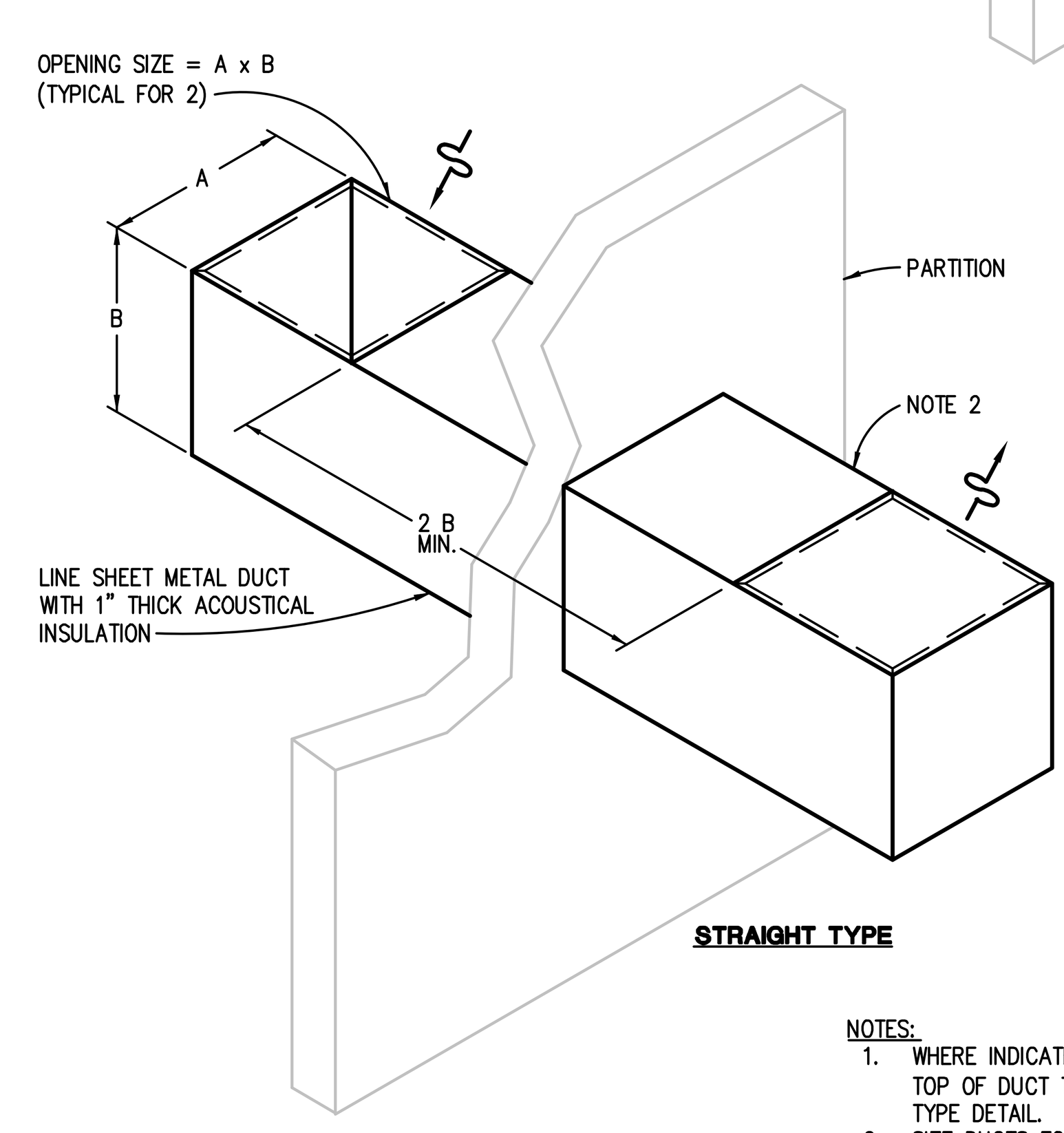
L TYPE



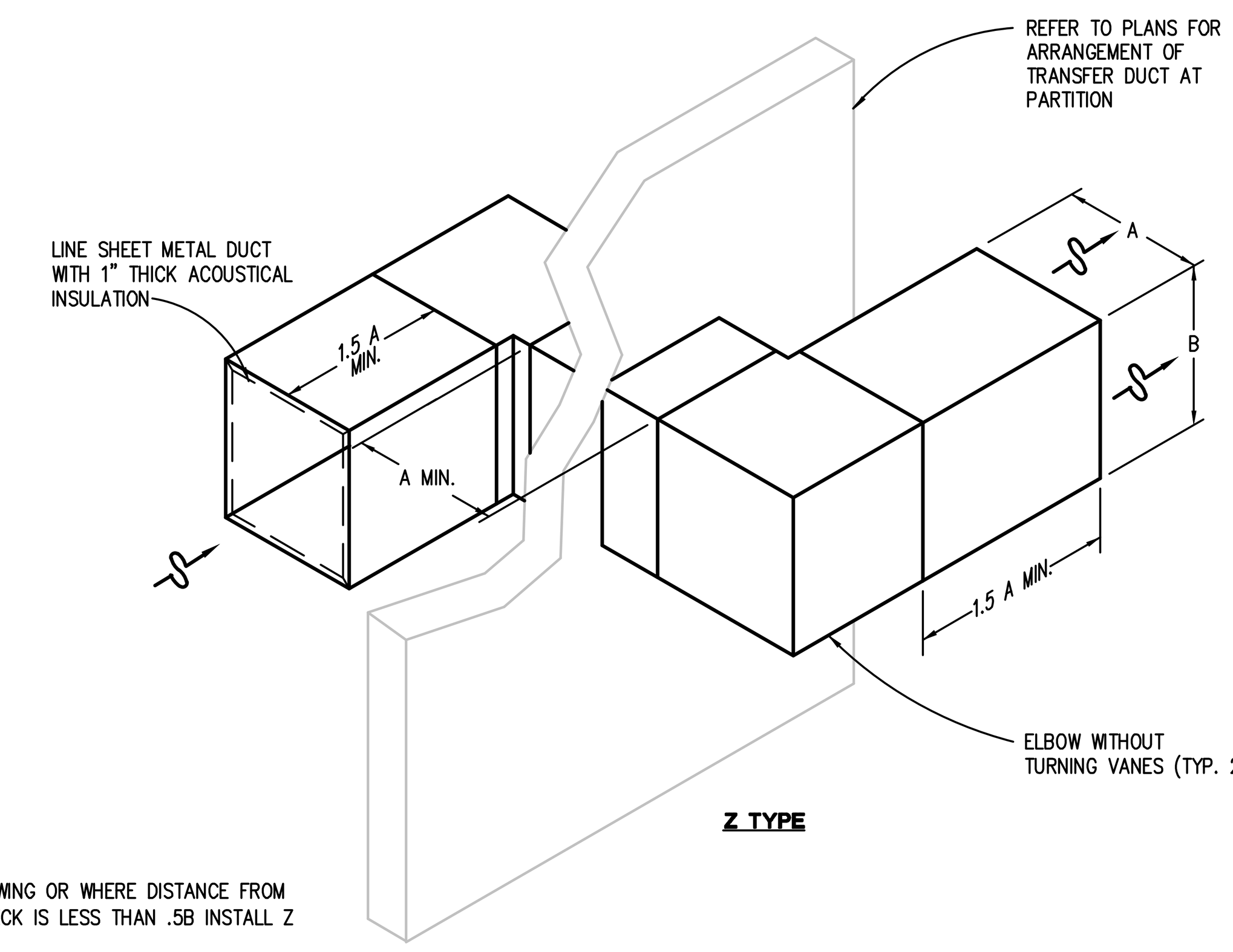
PLENUM TO / FROM WALL GRILLE

PLENUM RETURN AIR GRILLE DETAILS

NO SCALE



STRAIGHT TYPE



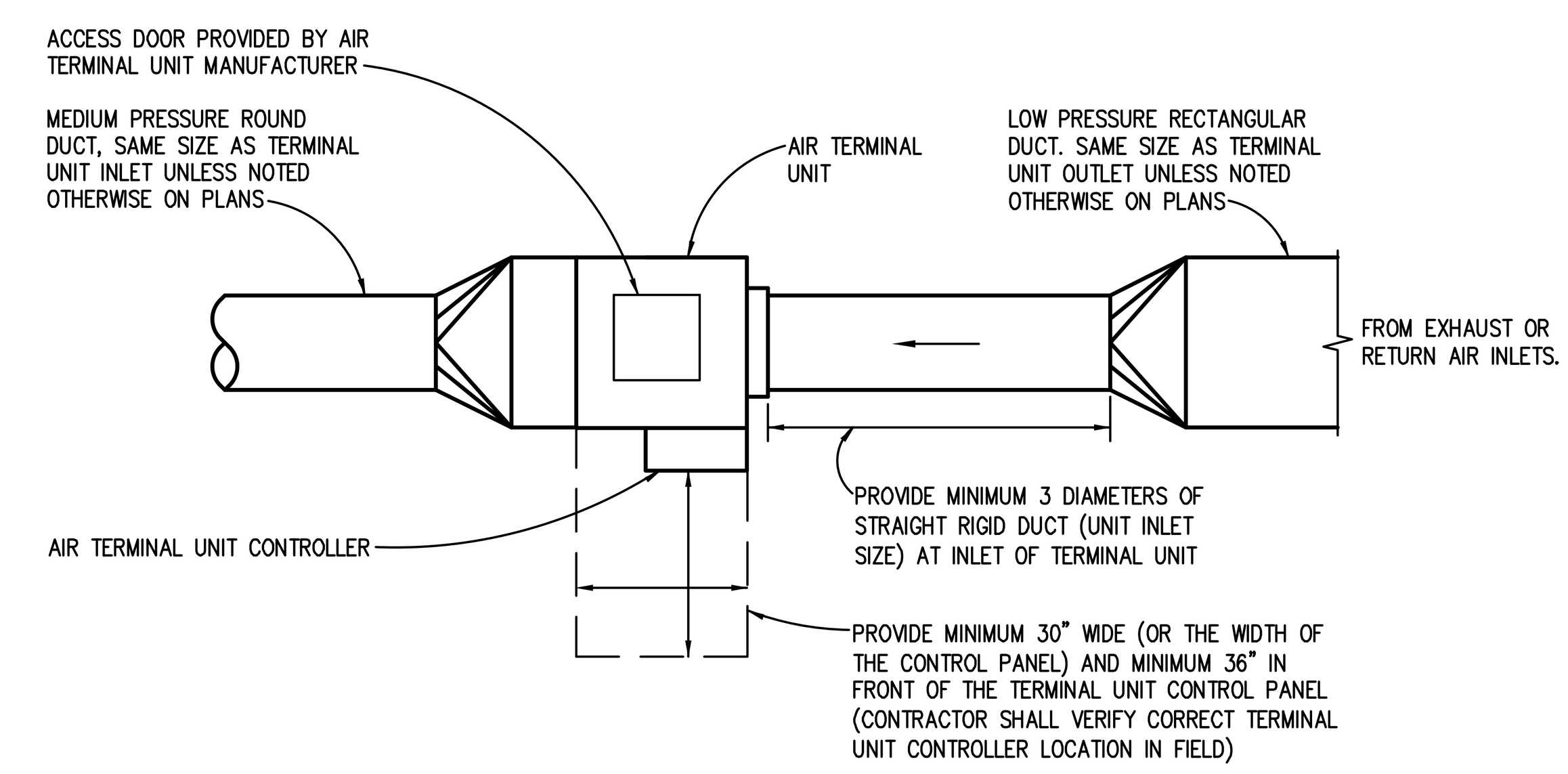
Z TYPE

NOTES:
1. WHERE INDICATED ON DRAWING OR WHERE DISTANCE FROM TOP OF DUCT TO SLAB/DECK IS LESS THAN .5B INSTALL Z TYPE DETAIL.
2. SIZE DUCTS FOR 400 FPM MAX BASED ON CLEAR INSIDE DIMENSIONS AND 100% OF THE SUPPLY AIR TO THE SPACE UNLESS OTHERWISE NOTED.
3. ROTATE DETAILS 90° WHERE VERTICAL INSTALLATION IS INDICATED.
4. DIMENSIONS ARE INSIDE CLEAR.

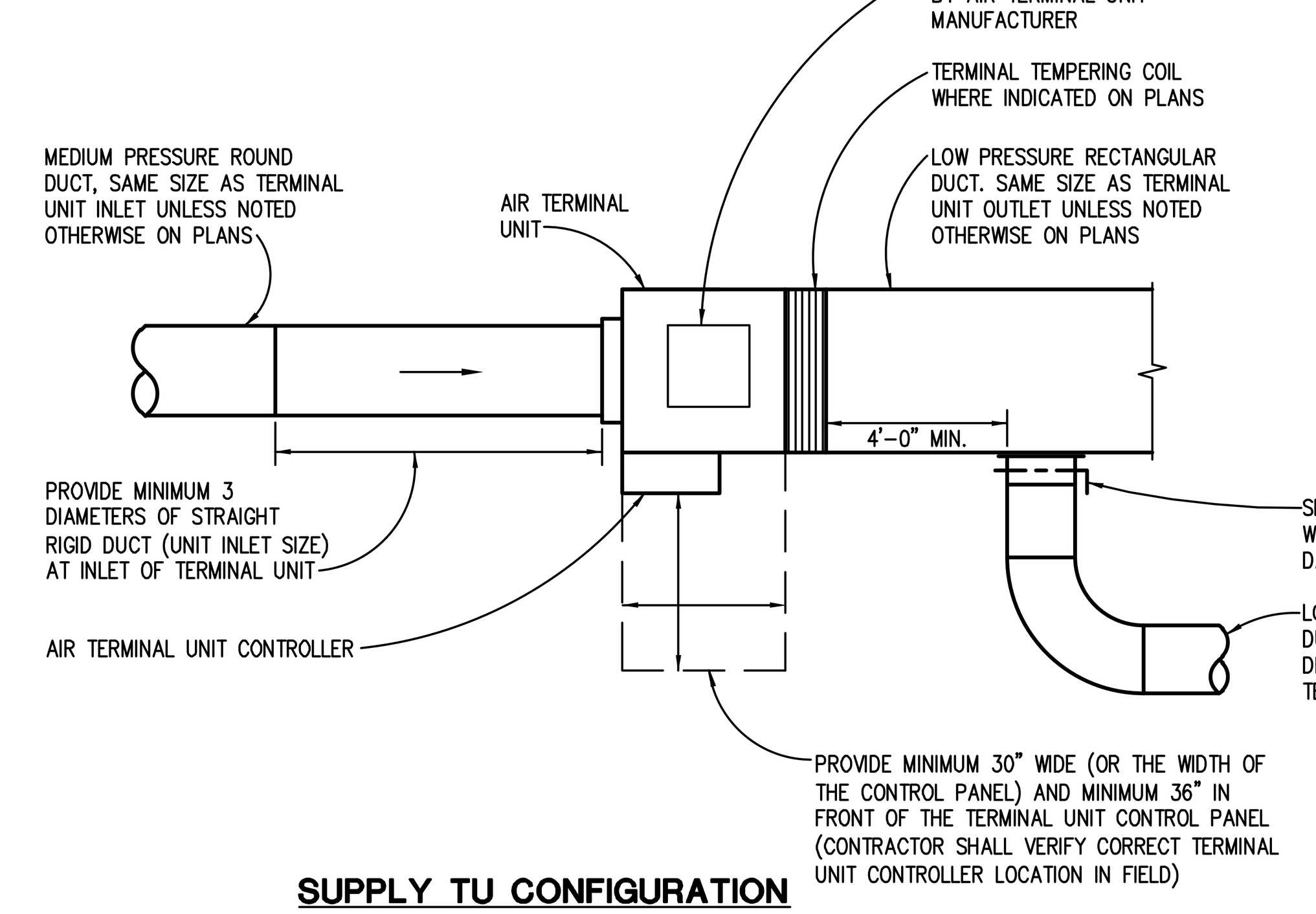
OPTIONS:
1. RIGID FIBER BOARD MAY BE USED IN LIEU OF LINED SHEET METAL DUCT.

AIR TRANSFER DUCT DETAILS

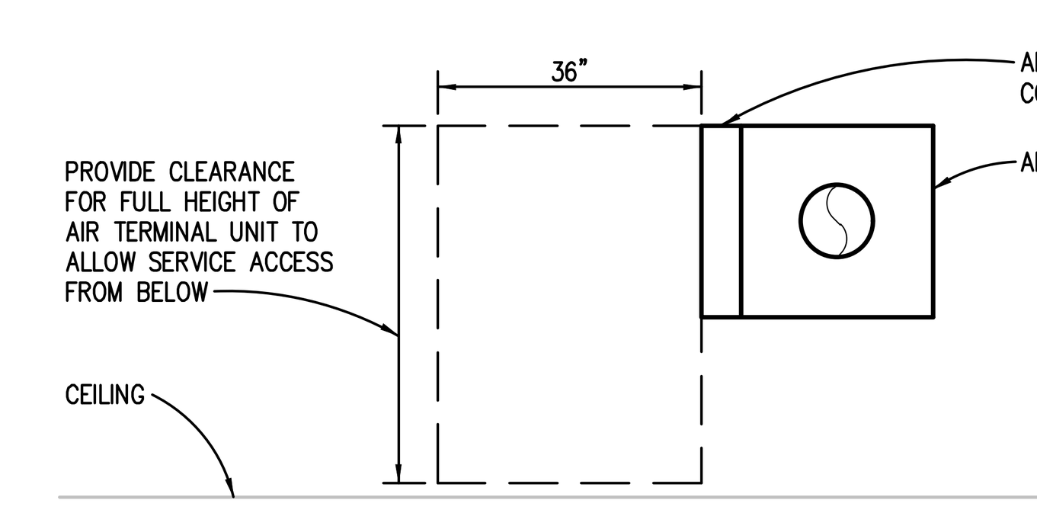
NO SCALE



EXHAUST TU CONFIGURATION



SUPPLY TU CONFIGURATION



TERMINAL UNIT SECTION

AIR TERMINAL UNIT (TU) DETAIL

NO SCALE

TMP ARCHITECTURE
TMP ARCHITECTURE INC
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M6.5-BP3

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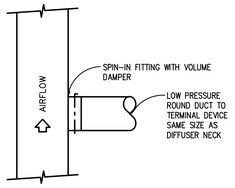
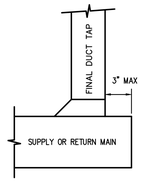
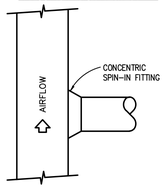
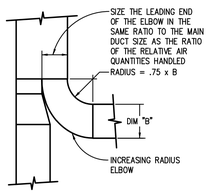




LOW PRESSURE INLET/OUTLET TO/FROM DIFFUSER, REGISTER OR GRILLE



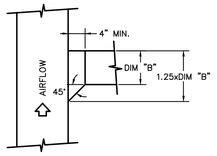
LOW PRESSURE END OF RUN

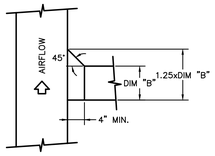


RECTANGULAR TO ROUND DUCT

SUPPLY, RETURN OR EXHAUST DUCT

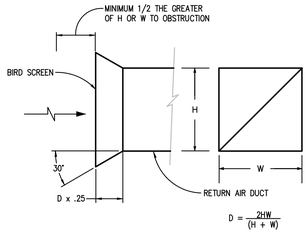
FOR USE WHEN A BRANCH TAKE-OFF IS TO HANDLE MORE THAN 25% OF THE AIR HANDLED BY THE MAIN DUCT



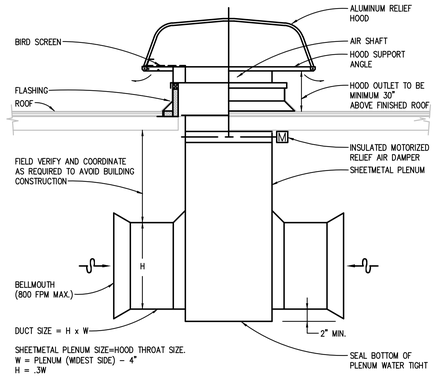


SUPPLY DUCT **RETURN OR EXHAUST DUCT**

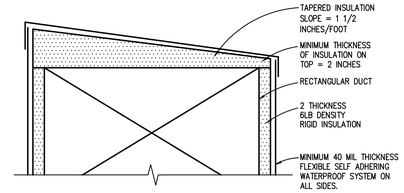
RECTANGULAR DUCT BRANCH TAKE-OFF DETAILS
NO SCALE



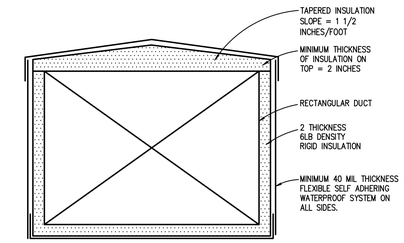
BELLMOUTH DETAIL
NO SCALE



RELIEF AIR DUCTWORK DETAIL
NO SCALE

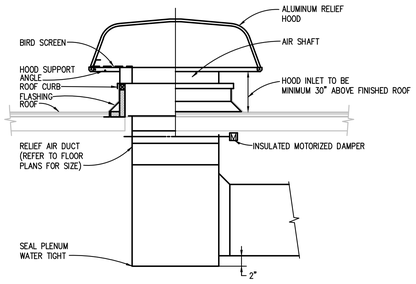


SLOPED IN ONE DIRECTION
OPTIONAL FOR DUCTS 30" AND SMALLER

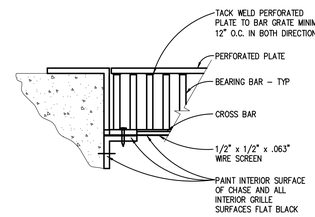


SLOPED IN TWO DIRECTIONS

OUTDOOR DUCT INSULATION DETAIL
NO SCALE



DUCTED INTAKE OR RELIEF HOOD INSTALLATION DETAIL
NO SCALE



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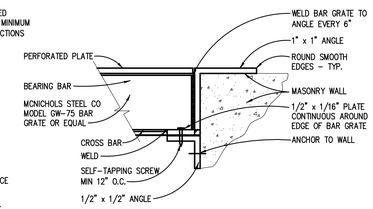
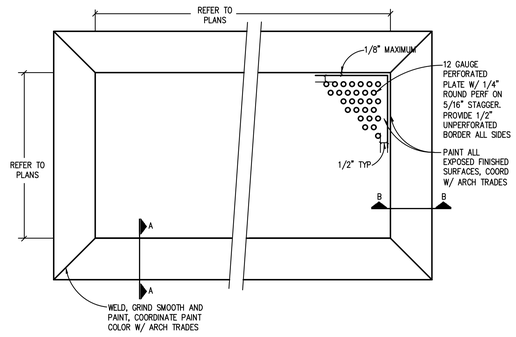
NO SCALE

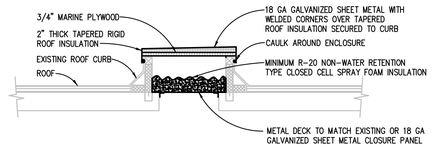


SECTION "A-A"
NO SCALE



NOTES:
GRIND AND DEBURR ALL SURFACES PRIOR TO APPLYING FINISH.

HEAVY DUTY RETURN AIR GRILLE DETAIL
NO SCALE



NOTE:
1. FASTEN TOP CLOSURE, WITH SCREWS THROUGH SIDE.
2. NOT TO BE USED FOR CURBS GREATER THAN 24" IN ANY DIMENSION

SMALL ROOF CURB CAP DETAIL
NO SCALE

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE
MECHANICAL DETAILS

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN	KRD
CHECKED	SVM
APPROVED	RNR

PROJECT NO.
19040

DRAWING NO.
M6.6-BP3

PLUMBING PIPING & VALVE APPLICATION SCHEDULE

PIPE SIZE (INCHES)	MATERIAL: SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (STD.)	GALV. STEEL (SCHED. 40)	PEX	PE PIPE	PE SHEATHED CARBON STEEL PIPE	CSST	PRESSURE CONNECTIONS: NO-HUB CISP	PVC TYPE DWV	PP DRAINAGE PIPE	COPPER TYPE DWV	DUCTILE IRON PIPE	SOLDERED	BRAZED	WELDED	THREADED	FLANGED	GROVED	INSERT & GRIMP	FUSION	PRESSURE-SEAL	MECHANICALLY-FORMED TEE	MECHANICAL JOINT	PUSH-ON-JOINT	GRAVITY DWV CONNECTIONS: SOLVENT WELDED	SOLDERED	FUSION	CISP HUBLESS	HEAVY-DUTY HUBLESS	ISOLATION VALVES: BALL	AGA BALL	GENERAL SERVICE BUTTERFLY	LUBRICATED PLUG	GATE	KEYED NOTES
ABOVEGROUND DOMESTIC WATER (POTABLE AND NON-POTABLE) ON DISTRIBUTION SIDE OF METER - MIN. WORKING PRESS. & TEMP.: 125 PSIG AT 200 DEG F																																							
UP TO 4		X														X	X			X	X			X	X								X		X			A
6		X															X			X	X				X										X			A
UNDERGROUND DOMESTIC WATER (POTABLE AND NON-POTABLE) ON DISTRIBUTION SIDE OF METER - MIN. WORKING PRESS. & TEMP.: 125 PSIG AT 150 DEG F																																						
UP TO 1-1/2	X																																					B
ABOVEGROUND SANITARY WASTE & VENT - MIN. WORKING PRESS.: 10-FOOT HEAD OF WATER																																						
1-1/2 TO 15											X																					X						
ABOVEGROUND PUMPED SANITARY WASTE - MIN. WORKING PRESS.: 125 PSIG																																						
UP TO 2		X														X	X																X					
2-1/2 TO 8							X													X															X			A
ABOVEGROUND INDIRECT SANITARY WASTE - MIN. WORKING PRESS.: 10-FOOT HEAD OF WATER																																						
UP TO 8			X											X															X									
UNDERGROUND SANITARY WASTE & VENT - MIN. WORKING PRESS.: 10-FOOT HEAD OF WATER																																						
3 TO 12											X																					X						
3 TO 12												X																	X									
15											X																					X						
ABOVEGROUND COLD CONDENSATE DRAIN - MIN. WORKING PRESSURE: 10 FT. HEAD OF WATER																																						
ALL SIZES			X												X	X	X																						
ABOVEGROUND PUMPED COLD CONDENSATE DRAIN - MIN. WORKING PRESSURE: 125 PSIG																																						
UP TO 2			X													X	X																X					
2-1/2 TO 4			X														X																			X			
ABOVEGROUND STORM DRAINAGE - MIN. WORKING PRESS.: 10-FOOT HEAD OF WATER																																						
2											X																					X						
3 TO 15											X																					X						
UNDERGROUND STORM DRAINAGE - MIN. WORKING PRESS.: 10-FOOT HEAD OF WATER																																						
3 TO 12											X																					X						
3 TO 12												X																	X									
15											X																					X						
ABOVEGROUND FUEL GAS - MIN. WORKING PRESS.: 100 PSIG																																						
UP TO 2				X														X	X															X				C
2-1/2 TO 3				X														X		X														X				C
4 TO 10				X														X		X																X		C
12 AND LARGER					X													X		X																X		C
UNDERGROUND FUEL GAS - MIN. WORKING PRESS.: 100 PSIG																																						
1/2 TO 12								X																X														D
ABOVEGROUND CHEMICAL-WASTE AND VENT - MIN. WORKING PRESS.: 10-FOOT HEAD OF WATER																																						
1-1/2 TO 6													X													X					X							

GENERAL NOTES

1. "X" INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. DISSIMILAR-METAL PIPING JOINTS: CONSTRUCT JOINTS USING DIELECTRIC FITTINGS COMPATIBLE WITH BOTH PIPING MATERIALS.
   a. NPS 2 AND SMALLER: USE DIELECTRIC NIPPLE/WATERWAY.
   b. NPS 2-1/2 AND LARGER: USE DIELECTRIC FLANGE KITS.
3. USE UNIONS OR FLANGES AT VALVE AND EQUIPMENT CONNECTIONS.
4. PLUMBING EQUIPMENT DRAINS, VENTS, SAFETY VALVE PIPING, BLOWDOWN PIPING AND THE LIKE SHALL BE SAME PIPING MATERIAL AS ASSOCIATED PIPING SYSTEM.
5. GROOVED END VALVES MAY BE USED WITH GROOVED PIPING.

KEYED NOTES

A. GROOVED AND FLANGED FITTINGS, JOINTS, AND COUPLINGS, IF INDICATED AS AN ACCEPTABLE SELECTION, MAY BE USED IN ACCESSIBLE LOCATIONS ONLY FOR THIS PIPING SYSTEM. ACCESSIBLE LOCATIONS ARE DEFINED AS EXPOSED CONSTRUCTION OR ABOVE LAY-IN CEILINGS.
B. JOINTS ARE NOT PERMITTED ON UNDERGROUND WATER PIPING.
C. VALVES, UNIONS, AND FLANGED JOINTS MAY BE USED IN ACCESSIBLE LOCATIONS ONLY, EXCLUDING CEILINGS USED AS AIR PLENUMS. ACCESSIBLE LOCATIONS ARE DEFINED AS EXPOSED CONSTRUCTION OR ABOVE LAY-IN CEILINGS. USE ONLY STEEL WELDED FITTINGS AND WELDED JOINTS IN CEILING USED AS AIR PLENUMS.
D. NO JOINTS ALLOWED UNDERGROUND.

ABOVEGROUND HVAC PIPING & VALVE APPLICATION SCHEDULE

PIPE SIZE (INCHES)	MATERIAL: SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (SCHED. 80)	CARBON STEEL (STD.)	COPPER TYPE DWV	CONNECTION: SOLDERED	BRAZED	WELDED	THREADED	FLANGED	GROOVED	PRESSURE SEAL	MECHANICALLY FORMED TEE	ISOLATION VALVES: BALL	GENERAL SERVICE BUTTERFLY	HI-PERF BUTTERFLY	GATE	KEYED NOTES
HEATING HOT WATER SUPPLY & RETURN - MIN. WORKING PRESS. & TEMP.: 125 PSIG AT 200 DEG F																				
UP TO 2		X						X	X					X	X	X				
2-1/2 TO 4				X						X		X	X				X			A
6 TO 8				X						X		X	X				X			A

GENERAL NOTES

1. "X" INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. DISSIMILAR-METAL PIPING JOINTS: CONSTRUCT JOINTS USING DIELECTRIC FITTINGS COMPATIBLE WITH BOTH PIPING MATERIALS. IF A BRONZE VALVE CONNECTS THE DISSIMILAR METALS NO FURTHER DIELECTRIC ISOLATION IS REQUIRED.
   a. NPS 2 AND SMALLER: USE BRASS COUPLING, NIPPLE, OR UNION.
   b. NPS 2-1/2 AND LARGER: USE DIELECTRIC FLANGE KITS.
3. USE UNIONS OR FLANGES AT VALVE AND EQUIPMENT CONNECTIONS.
4. HVAC EQUIPMENT DRAINS, VENTS, SAFETY VALVE PIPING, BLOWDOWN PIPING AND THE LIKE SHALL BE SAME PIPING MATERIAL AS ASSOCIATED PIPING SYSTEM.
5. GROOVED END VALVES MAY BE USED WITH GROOVED PIPING.

KEYED NOTES

A. GROOVED AND FLANGED FITTINGS, JOINTS, AND COUPLINGS, IF INDICATED AS AN ACCEPTABLE SELECTION, MAY BE USED IN ACCESSIBLE LOCATIONS FOR THIS PIPING SYSTEM ONLY. ACCESSIBLE LOCATIONS ARE DEFINED AS EXPOSED CONSTRUCTION OR ABOVE LAY-IN CEILINGS.
B. BALL VALVE WITH 250 PSIG STEAM TRIM.
C. BALL VALVE WITH 150 PSIG STEAM TRIM.

ABOVEGROUND PLUMBING PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES): FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	FIELD-APPLIED JACKET MATERIAL: ALUMINUM	STAINLESS STEEL	PVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
INDOOR PIPE SYSTEM AND SIZE (INCHES)														
DOMESTIC COLD WATER	1	1						X		X				A
DOMESTIC HOT WATER SUPPLY & RETURN 140 DEG F AND LESS:														
NPS 1-1/4 AND SMALLER	1	1						X		X				A
NPS 1-1/2 AND LARGER	1.5	1.5						X		X				A
STORM WATER & OVERFLOW	1	1						X		X				A
ROOF DRAIN AND OVERFLOW DRAIN BODIES	1	1												
CONDENSATE AND EQUIPMENT DRAIN PIPING BELOW 60 DEG F	0.75	1												
FLOOR DRAINS, TRAPS AND SANITARY DRAIN PIPING WITHIN 10 FEET OF DRAIN RECEIVING CONDENSATE AND EQUIPMENT DRAIN WATER BELOW 60 DEG F	0.75	1						X		X				A

UNLESS OTHERWISE INDICATED OR SCHEDULED, DO NOT INSULATE THE FOLLOWING:
- FIRE SUPPRESSION PIPING
- UNDERGROUND PIPING
- LABORATORY GAS AND VACUUM PIPING
- MEDICAL GAS AND VACUUM PIPING
- FUEL GAS PIPING
- FUEL OIL PIPING

GENERAL NOTES

1. "X" OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.

KEYED NOTES

A. PROVIDE FIELD APPLIED JACKET FOR PIPING EXPOSED IN EQUIPMENT ROOMS, STORAGE ROOMS, JANITORS CLOSETS, RECEIVING ROOMS, TEST AREAS, CIRCULATION AREAS AND SUCH AREAS SUBJECT TO DAMAGE, WITHIN 10 FEET (3 METERS) OF FINISHED FLOOR.
B. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL INSULATION.

MECHANICAL EQUIPMENT INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES): FLEXIBLE ELASTOMERIC	FIBERGLASS, LARGE DIAMETER PIPE & TANK	FIBERGLASS BOARD	FIELD APPLIED JACKET MATERIAL: ALUMINUM	PVC	KEYED NOTES
HEAT EXCHANGER (FOR HEATING SERVICE)		2	2	X	X	
DOMESTIC COLD WATER PUMPS	1		1	X	X	A
DOMESTIC HOT, COLD, AND CHILLED WATER HYDROPNEUMATIC TANKS	1	1	1			A
HEATING WATER AIR SEPARATORS		2	2	X	X	

GENERAL NOTES

1. "X" OR THICKNESS IN INCHES INDICATE ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED.
2. REFER TO SPECIFICATIONS FOR FACTORY INSULATED EQUIPMENT.

KEYED NOTES

A. FIELD APPLIED JACKETS NOT REQUIRED FOR FLEXIBLE ELASTOMERIC INSULATION.
B. SELECT INSULATION THICKNESS TO PROVIDE MINIMUM R-VALUE OF 12.5.

ROOF MOUNTED PIPING SUPPORT APPLICATION SCHEDULE

PIPE TYPE & SIZE	SUPPORT TYPE: LOW FIXED-HEIGHT SINGLE-BASE STAND	LOW ADJUSTABLE-HEIGHT SINGLE-BASE STAND	HIGH ADJUSTABLE-HEIGHT SINGLE-BASE STAND	LOW FIXED HEIGHT SINGLE-BASE ROLLER STAND	LOW ADJUSTABLE-HEIGHT SINGLE-BASE ROLLER STAND	HIGH MULTIPLE-BASE PIPE STAND	CUSTOM MULTIPLE BASE PIPE STAND	CURB-MOUNTING PIPE STAND	SHIELD TYPE: MSS TYPE 39 PROTECTION SADDLE	MSS TYPE 40 INSULATION PROTECTION SHIELD	THERMAL-HANGER SHIELD	KEYED NOTES
SINGLE PIPES												
NATURAL GAS NPS 5 AND SMALLER				X	X			X				
NATURAL GAS NPS 6 AND NPS 8					X			X				
REFRIGERANT PIPE NPS 4 AND SMALLER				X	X			X				
CONDENSATE DRAIN PIPE ALL SIZES	X	X						X				
HEATING HOT WATER SUPPLY AND RETURN NPS 5 AND SMALLER			X					X		X	X	A, D
HEATING HOT WATER SUPPLY AND RETURN NPS 6 TO NPS 16						X		X			X	D
MULTIPLE PARALLEL PIPES												
NATURAL GAS NPS 5 AND SMALLER	X	X						X				
NATURAL GAS NPS 6 AND NPS 8	X	X						X				
REFRIGERANT PIPE NPS 4 AND SMALLER	X	X						X				
CONDENSATE DRAIN PIPE ALL SIZES	X	X						X				
HEATING HOT WATER SUPPLY AND RETURN NPS 5 AND SMALLER						X	X	X		X	X	A, D
HEATING HOT WATER SUPPLY AND RETURN NPS 6 TO NPS 16						X	X	X			X	D

GENERAL NOTES

1. "X" INDICATES APPROVED HANGER OR SUPPORT ELEMENTS. IF MORE THAN ONE HANGER OR SUPPORT ELEMENT IS INDICATED, SELECTION FROM APPROVED ELEMENTS IS CONTRACTOR'S OPTION.
2. REFER TO HANGER AND SUPPORT SECTION FOR APPROVED MANUFACTURERS. CONTRACTOR'S OPTION.
3. SUPPORT ELEMENTS IN CONTACT WITH BARE COPPER PIPE SHALL BE COPPER PLATED, PLASTIC OR PLASTIC COATED, FELT LINED, OR USE MANUFACTURED COPPER TUBE ISOLATORS

KEYED NOTES

A. TYPE 40 SHIELD MAY BE USED ON INSULATED PIPE SIZED NPS 2 AND SMALLER.
B. CONSULT WITH SUPPORT MANUFACTURER FOR CUSTOM SUPPORT REQUIREMENTS.
C. USE THERMAL HANGER SHIELD FOR INSULATED RING.
D. TYPE 39 PROTECTION SADDLE MAY BE USED IF INSULATION WITHOUT VAPOR BARRIER IS INDICATED. FILL INTERIOR VOIDS WITH INSULATION MATCHING ADJOINING INSULATION.

SCHEDULES GENERAL NOTES:

TYPICAL FOR ALL SCHEDULE SHEETS:

1. REFER TO ELECTRICAL STANDARD SCHEDULES, ONE LINE DIAGRAM AND PANEL SCHEDULES FOR ADDITIONAL ELECTRICAL INFORMATION
2. PROVIDE THE FOLLOWING FACTORY-WIRED ELECTRICAL OPTIONS/ACCESSORIES WHERE INDICATED IN SCHEDULE:
   - A – NON-FUSED DISCONNECT SWITCH
   - B – UNIT SHALL BE SINGLE POINT ELECTRICAL CONNECTION WITH FACTORY INSTALLED DISCONNECTING MEANS AND ALL REQUIRED STARTERS AND CONTROLS
   - C – SERVICE RECEPTACLE
   - D – FUSED DISCONNECT SWITCH
   - E – COMBINATION STARTER
   - F – UNIT SHALL HAVE (2) SINGLE POINT CONNECTIONS WITH FACTORY INSTALLED DISCONNECTING MEANS AND ALL REQUIRED STARTERS AND CONTROLS. (1) CONNECTION SHALL BE FOR CONDENSING SECTION AND (1) CONNECTION SHALL BE FOR THE REMAINDER OF THE UNIT.
3. FOR MODULATION/CONTROL TYPE COLUMN, "VFC" INDICATES VARIABLE FREQUENCY CONTROLLERS, "AUTO" INDICATES AUTOMATIC OPERATION (CONTROLLED BY TEMPERATURE CONTROLS OR SELF CONTAINED CONTROLS), "MANUAL" INDICATES HAND OPERATION.
4. IF VARIABLE FREQUENCY CONTROLLERS ARE INDICATED TO BE PROVIDED AND ARE NOT INSTALLED INTEGRAL TO THE UNIT, VARIABLE FREQUENCY CONTROLLERS SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR (UNLESS OTHERWISE NOTED) AND INSTALLED BY THE ELECTRICAL CONTRACTOR INCLUDING THE LINE SIDE AND LOAD SIDE WIRING TO THE MOTOR AND INCLUDING MISCELLANEOUS STEEL REQUIRED FOR THE SUPPORT AND MOUNTING OF THE VFC. REFER TO FLOOR PLANS FOR LOCATION.
5. WHERE EQUIPMENT IS INDICATED TO HAVE A SINGLE POINT ELECTRICAL CONNECTION, THAT EQUIPMENT SHALL COME COMPLETE WITH FACTORY INSTALLED STARTERS, MOTOR OVERLOAD PROTECTION, CONTACTORS, FUSING AND ALL NECESSARY INTERNAL WIRING AND CONTROLS. PROVIDE A FACTORY MOUNTED UNIT DISCONNECTING MEANS WHERE THE ELECTRICAL CONTRACTOR SHALL MAKE SINGLE POINT CONNECTION. INSTALL PACKAGED EQUIPMENT SUCH THAT THE ELECTRICAL CONNECTION AND CONTROLS ARE ACCESSIBLE AND HAVE CLEARANCES MEETING THE NATIONAL ELECTRICAL CODE.
6. WHERE PACKAGED EQUIPMENT IS PROVIDED, NAMEPLATE MUST INDICATE MAXIMUM OVERCURRENT PROTECTION BY HACR RATED CIRCUIT BREAKERS OR FUSES. IF FUSE PROTECTION ONLY IS INDICATED, PROVIDE A FUSIBLE DISCONNECT AND FUSES WITH THE UNIT.
7. WHERE EQUIPMENT IS DESIGNATED BY MANUFACTURER AND MODEL NUMBER, THIS IS THE BASIS OF DESIGN. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT BY OTHER SPECIFIED MANUFACTURERS OR PROPOSED ALTERNATE EQUIPMENT BY THE BASIS OF DESIGN MANUFACTURER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REVISIONS TO ELECTRICAL REQUIREMENTS, STRUCTURAL LOADING, OR ARCHITECTURAL APPURTENANCES AND SHALL INCLUDE THE COST OF SUCH REVISIONS IN HIS BID.
8. WHERE EQUIPMENT IS SCHEDULED TO INCLUDE A SERVICE RECEPTACLE, PROVIDE A FACTORY MOUNTED SERVICE RECEPTACLE WITH APPROPRIATE FUSES AND TRANSFORMERS CONNECTED ON THE LINE SIDE OF THE UNIT DISCONNECT. PROVIDE A NAMEPLATE ON THE DISCONNECT SWITCH INDICATING THE PRESENCE OF LIVE POWER TO THE SERVICE RECEPTACLE WHEN THE UNIT DISCONNECT IS IN THE OFF POSITION.
9. SIZE ALL EQUIPMENT FEEDERS BASED ON THE LISTED MOP (MAXIMUM OVERCURRENT PROTECTION). REFER TO THE FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE ON THE ELECTRICAL STANDARD SCHEDULES SHEET.

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PBA Project No.: 2019-0237

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1735 South Wagner Road
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DRAWING TITLE

MECHANICAL SCHEDULES

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08-12-2019	SCHEMATIC DESIGN

DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M7.1-BP3

ABOVEGROUND HVAC PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD-APPLIED JACKET MATERIAL						
	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	STAINLESS STEEL	PVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
INDOOR PIPE SYSTEM AND SIZE (INCHES)														
HEATING HOT WATER SUPPLY & RETURN 200 DEG F AND LOWER														
NPS 1-1/4 AND SMALLER		1.5						X		X				A
NPS 1-1/2 AND LARGER		2						X		X				A

UNLESS OTHERWISE INDICATED OR SCHEDULED, THE FOLLOWING DO NOT REQUIRE INSULATION:
DIRECT BURIED COOLING SYSTEM PIPING
PIPING THAT CONVEYS FLUIDS HAVING DESIGN OPERATING TEMPERATURE RANGE BETWEEN 60 DEG F. AND 105 DEG F., INCLUSIVE.

GENERAL NOTES

1. 'X' OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.
3. FOR PIPING NPS 1-1/4 AND SMALLER WITHIN PARTITIONS IN CONDITIONED SPACES INSULATION MAY BE REDUCED BY ONE-INCH THICKNESS, BUT NOT TO LESS THAN ONE-INCH THICKNESS.
4. FOR PIPING NPS 1 AND SMALLER, INSULATION IS NOT REQUIRED FOR STRAINERS, CONTROL VALVES, AND BALANCING VALVES.

KEYED NOTES

A. PROVIDE FIELD APPLIED JACKET FOR PIPING EXPOSED IN EQUIPMENT ROOMS, STORAGE ROOMS, JANITORS CLOSETS, RECEIVING ROOMS, TEST AREAS, CIRCULATION AREAS AND SUCH AREAS SUBJECT TO DAMAGE WITHIN 10 FEET (3 METERS) OF FINISHED FLOOR.
B. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL INSULATION.
C. STEAM AND CONDENSATE PIPING JACKET SHALL BE STUCCO EMBOSSED.
D. PIPING WITHIN ENERGY RECOVERY UNITS SHALL BE TYPE 304 STAINLESS STEEL, SMOOTH; 0.010 INCH THICK. SEAMS AND JOINTS CAULKED WITH CHEMICALLY RESISTANT SEALER.

DUCT SYSTEM INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD APPLIED JACKET MATERIAL		
	FIBERGLASS BLANKET 0.75 LB/CU FT	FIBERGLASS BLANKET 1.0 LB/CU FT	FIBERGLASS BOARD 2.25 LB/CU FT	FIBERGLASS BOARD 6.0 LB/CU FT	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE RATED BLANKET	2-HOUR FIRE RATED BLANKET	ALUMINUM	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	KEYED NOTES
DUCT SYSTEMS LOCATED INDOORS										
SUPPLY AIR, EXCEPT AS NOTED BELOW		1.5								A, E
RECTANGULAR SUPPLY AIR IN MECHANICAL ROOMS			1.5							
RECTANGULAR RETURN AIR IN MECHANICAL EQUIPMENT ROOMS			1.5							
EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, EXCEPT AS NOTED BELOW		1.5								
RECTANGULAR EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, IN MECHANICAL ROOMS			1.5							
LOCKER ROOM AND WET AREA EXHAUST BETWEEN EXHAUST GRILLE & CONNECTION TO GENERAL EXHAUST OR BETWEEN EXHAUST GRILLE AND PENETRATION OF BUILDING EXTERIOR		1.5								
KITCHEN EXHAUST (TYPE I HOOD)						X				B, C
KITCHEN EXHAUST AIR (TYPE II HOODS)		1.5								
STERILIZER/WASHER EXHAUST AIR		1.5								
DUCT SYSTEMS LOCATED OUTDOORS										
RECTANGULAR DUCTS AND AIR PLENUMS, ALL TYPES				2					X	

PLENUMS, DUCTS, AND DUCT ACCESSORIES NOT REQUIRING INSULATION:
FIBROUS-GLASS DUCTS
DOUBLE-WALL METAL DUCTS WITH INSULATION OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1 - 2013
METAL DUCTS WITH DUCT LINER OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1 - 2013
FABRIC SUPPLY DUCTS
FACTORY-INSULATED FLEXIBLE DUCTS
FACTORY-INSULATED PLENUMS AND CASINGS
FLEXIBLE CONNECTORS
VIBRATION-CONTROL DEVICES
FACTORY-INSULATED ACCESS PANELS AND DOORS

GENERAL NOTES

1. 'X' OR THICKNESS IN INCHES INDICATE ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A DUCT SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. REFER TO METAL DUCT SECTION OF SPECIFICATIONS FOR DUCT LINING AND DOUBLE-WALL INSULATED DUCT.
3. REFER TO HVAC CASINGS SECTION OF SPECIFICATIONS FOR DOUBLE-WALL INSULATED PLENUMS.

KEYED NOTES

A. INCLUDE INSULATION AROUND DUCT MOUNTED COILS AND AIR TERMINAL UNIT COILS.
B. NUMBER OF LAYERS AND TOTAL INSULATION THICKNESS AS RECOMMENDED BY SELECTED MANUFACTURER.
C. DOES NOT APPLY TO PREFABRICATED, ZERO-CLEARANCE GREASE DUCT.
D. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL DUCT INSULATION.
E. EXPOSED SUPPLY DUCTWORK LOCATED IN CONDITIONED SPACE SERVED BY THAT SYSTEM IS NOT REQUIRED TO BE INSULATED.

NATATORIUM ABOVEGROUND HVAC PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD-APPLIED JACKET MATERIAL						
	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	STAINLESS STEEL	PVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
INDOOR PIPE SYSTEM AND SIZE (INCHES)														
HEATING HOT WATER SUPPLY & RETURN 200 DEG F AND LOWER														
3 AND SMALLER		1						X		X				A
4 AND LARGER		1.5						X		X				A
REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)	1							X		X				

GENERAL NOTES

1. 'X' OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.

KEYED NOTES

A. PROVIDE FIELD APPLIED JACKET FOR PIPING IN POOL STORAGE AND POOL FILTRATION ROOMS.
B. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL INSULATION.

NATATORIUM ABOVEGROUND HVAC PIPING & VALVE APPLICATION SCHEDULE

	MATERIAL							CONNECTION							ISOLATION VALVES				
PIPE SIZE (INCHES)	SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (SCHED. 80)	CARBON STEEL (STD.)	COPPER TYPE DWV	SOLDERED	BRAZED	WELDED	THREADED	FLANGED	GROOVED	PRESSURE SEAL	MECHANICALLY FORMED TEE	BALL	GENERAL SERVICE BUTTERFLY	HI-PERF BUTTERFLY	GATE	KEYED NOTES
HEATING HOT WATER SUPPLY & RETURN - MIN. WORKING PRESS. & TEMP.: 125 PSIG AT 200 DEG F																				
UP TO 2		X						X					X			X				
2-1/2 TO 4		X							X				X				X			A

GENERAL NOTES

1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. DISSIMILAR-METAL PIPING JOINTS: CONSTRUCT JOINTS USING DIELECTRIC FITTINGS COMPATIBLE WITH BOTH PIPING MATERIALS. IF A BRONZE VALVE CONNECTS THE DISSIMILAR METALS NO FURTHER DIELECTRIC ISOLATION IS REQUIRED.
   a. NPS 2 AND SMALLER: USE BRASS COUPLING, NIPPLE, OR UNION.
   b. NPS 2-1/2 AND LARGER: USE DIELECTRIC FLANGE KITS.
3. USE UNIONS OR FLANGES AT VALVE AND EQUIPMENT CONNECTIONS.
4. HVAC EQUIPMENT DRAINS, VENTS, SAFETY VALVE PIPING, BLOWDOWN PIPING AND THE LIKE SHALL BE SAME PIPING MATERIAL AS ASSOCIATED PIPING SYSTEM.
5. GROOVED END VALVES MAY BE USED WITH GROOVED PIPING.

KEYED NOTES

A. GROOVED FITTINGS, JOINTS AND COUPLINGS MAY BE USED IN MECHANICAL ROOMS ONLY.

DUCT SYSTEM APPLICATION SCHEDULE

	DUCT MATERIAL																	
AIR SYSTEMS	G90 GALV. SHEET METAL	DOUBLE-WALL LINED G90 GALV. SHEET METAL (SOLID INNER WALL)	DOUBLE-WALL LINED G90 GALV. SHEET METAL (PERF. INNER WALL)	G90 GALV. SHEET METAL WITH 1-INCH LINING	GALVANNEALED SHEET METAL	ALUMINUM	TYPE 304 STAINLESS STEEL	TYPE 316 STAINLESS STEEL	PVC COATED GALV. SHEET METAL (4#)	PVC COATED GALV. SHEET METAL (1#)	PVC COATED GALV. SHEET METAL (4#)	16 GA. CARBON STEEL	ZERO-CLEARANCE PREFABRICATED RANGE HOOD EXHAUST DUCT	FABRIC	DESIGN PRESSURE CLASS (INCHES WG)	SEAL CLASS	MAX. ALLOWABLE LEAKAGE RATE (PERCENT)	KEYED NOTES
SUPPLY AIR WITHOUT TERMINAL UNITS	X														+2	A	5	
SUPPLY AIR UPSTREAM OF TERMINAL UNITS	X														+6	A	5	
SUPPLY AIR DOWNSTREAM OF TERMINAL UNITS	X	X													+2	A	5	
RETURN AIR WITHOUT TERMINAL UNITS	X														-2	A	5	
EXHAUST AIR WITHOUT TERMINAL UNITS	X														-2	A	5	
SUPPLY AIR IN NATATORIUM														X	+2	N/A	N/A	
RETURN OR EXHAUST AIR IN NATATORIUM						X	X								-2	A	5	
KITCHEN EXHAUST (TYPE I HOOD)												X	X		N/A	N/A	N/A	C
KITCHEN EXHAUST (TYPE II HOOD)							X								-2	N/A	N/A	C
STERILIZER/WASHER EXHAUST							X								-2	N/A	N/A	C
LAUNDRY EXHAUST (DRYER VENT)	X														+/-2	A	5	A
LOCKER ROOM AND WET AREA EXHAUST						X	X								-2	A	5	
AIR TRANSFER DUCT				X											+2	A	5	
RELIEF AIR DOWNSTREAM OF FANS	X														+6	A	5	
OUTSIDE AIR AND MIXED AIR DUCT	X														-6	A	5	
OUTSIDE AIR, RELIEF AIR AND EXHAUST AIR PLENUMS ADJACENT TO EXTERIOR LOUVERS		X													+/-6	A	5	

GENERAL NOTES

1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A DUCT SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. 4 X 1 PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON EXTERIOR SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL (0.025 MM) THICK ON INTERIOR SURFACES.
3. 1 X 4 (4 X 1 REVERSE COATED) PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON INTERIOR SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL (0.025 MM) THICK ON EXTERIOR SURFACES.
4. 4 X 4 PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND 4 MILS (0.10 MM) THICK ON OPPOSITE SURFACES.

KEYED NOTES

A. SCREWS, DAMPERS, OR PROJECTIONS OF ANY TYPE ON INTERIOR OF DUCT SURFACE ARE PROHIBITED.
B. DUCT SHALL BE LINED WITHIN 25 FEET UPSTREAM OF FANS.
C. ALL WELDED CONSTRUCTION.

NATATORIUM DUCT SYSTEM APPLICATION SCHEDULE

	DUCT MATERIAL																	
AIR SYSTEMS	G90 GALV. SHEET METAL	DOUBLE-WALL LINED G90 GALV. SHEET METAL (SOLID INNER WALL)	DOUBLE-WALL LINED G90 GALV. SHEET METAL (PERF. INNER WALL)	G90 GALV. SHEET METAL WITH 1-INCH LINING	GALVANNEALED SHEET METAL	ALUMINUM	TYPE 304 STAINLESS STEEL	TYPE 316 STAINLESS STEEL	PVC COATED GALV. SHEET METAL (4#)	PVC COATED GALV. SHEET METAL (1#)	PVC COATED GALV. SHEET METAL (4#)	THERMOPLASTIC (PVC)	ZERO-CLEARANCE PREFABRICATED RANGE HOOD EXHAUST DUCT	FABRIC	DESIGN PRESSURE CLASS (INCHES WG)	SEAL CLASS	MAX. ALLOWABLE LEAKAGE RATE (PERCENT)	KEYED NOTES
INDOOR (ABOVEGROUND) DUCTWORK																		
SUPPLY AIR FOR MAIN POOL														X	+6	A	5	
RETURN/EXHAUST AIR FOR MAIN POOL											X				-6	A	5	
TRANSFER AIR FOR POOL STORAGE											X				-2	A	5	
EXHAUST AIR FOR POOL STORAGE											X				-6	A	5	
TRANSFER AIR IN POOL FILTRATION											X				-2	A	5	
EXHAUST AIR IN POOL FILTRATION											X				-6	A	5	
EXHAUST AIR FROM CHEMICAL ROOM											X				-2	A	5	
OUTDOOR DUCTWORK																		
SUPPLY AIR FOR MAIN POOL										X					+6	A	5	
RETURN/EXHAUST AIR FOR MAIN POOL										X					-6	A	5	

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3. 1 X 4 (4 X 1 REVERSE COATED) PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON INTERIOR SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL (0.025 MM) THICK ON EXTERIOR SURFACES.
4. 4 X 4 PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND 4 MILS (0.10 MM) THICK ON OPPOSITE SURFACES.

KEYED NOTES

A. SCREWS, DAMPERS, OR PROJECTIONS OF ANY TYPE ON INTERIOR OF DUCT SURFACE ARE PROHIBITED.
B. DUCT SHALL BE LINED WITHIN 25 FEET UPSTREAM OF FANS.
C. ALL WELDED CONSTRUCTION.
D. INCLUDE INSULATION AROUND DUCT MOUNTED COILS AND AIR TERMINAL UNIT COILS.
E. INSULATE DUCTWORK IN CRAWLSPACES, VENTILATED ATTICS, AND PARKING GARAGES HAVING NATURAL OR MECHANICAL VENTILATION THE SAME AS OUTDOOR DUCTWORK. REFER TO DETAIL OUTDOOR DUCTWORK INSULATION ON DETAIL SHEETS.

NATATORIUM DUCT SYSTEM INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD APPLIED JACKET MATERIAL		
	FIBERGLASS BLANKET 0.75 LB/CU FT	FIBERGLASS BLANKET 1.0 LB/CU FT	FIBERGLASS BOARD 2.25 LB/CU FT	FIBERGLASS BOARD 6.0 LB/CU FT	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE RATED BLANKET	2-HOUR FIRE RATED BLANKET	ALUMINUM	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	KEYED NOTES
DUCT SYSTEMS LOCATED INDOORS										
POOL RETURN AIR ABOVE STAIRWELL CEILING			1.5							
RECTANGULAR SUPPLY AIR IN MECHANICAL ROOMS			1.5							
RECTANGULAR RETURN AIR IN MECHANICAL EQUIPMENT ROOMS			1.5							
EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, EXCEPT AS NOTED BELOW		1.5								
RECTANGULAR EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, IN MECHANICAL ROOMS			1.5							
DUCT SYSTEMS LOCATED OUTDOORS										
RECTANGULAR DUCTS AND AIR PLENUMS, ALL TYPES				2					X	E

PLENUMS, DUCTS, AND DUCT ACCESSORIES NOT REQUIRING INSULATION:
FIBROUS-GLASS DUCTS
DOUBLE-WALL METAL DUCTS WITH INSULATION OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1 - 2007
METAL DUCTS WITH DUCT LINER OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1 - 2007
EXPOSED SUPPLY DUCT IN CONDITIONED SPACE SERVED BY THAT SYSTEM
FABRIC SUPPLY DUCTS
FACTORY-INSULATED FLEXIBLE DUCTS
FACTORY-INSULATED PLENUMS AND CASINGS
FLEXIBLE CONNECTORS
VIBRATION-CONTROL DEVICES
FACTORY-INSULATED ACCESS PANELS AND DOORS

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A. INCLUDE INSULATION AROUND DUCT MOUNTED COILS AND AIR TERMINAL UNIT COILS.
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D. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL DUCT INSULATION.
E. INSULATE DUCTWORK IN CRAWLSPACES, VENTILATED ATTICS, AND PARKING GARAGES HAVING NATURAL OR MECHANICAL VENTILATION THE SAME AS OUTDOOR DUCTWORK. REFER TO DETAIL OUTDOOR DUCTWORK INSULATION ON DETAIL SHEETS.

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

MECHANICAL SCHEDULES

ISSUE DATES

05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M7.2-BP3

COMMERCIAL ROOFTOP AIR CONDITIONING UNIT SCHEDULE - PART A

UNIT I.D.	AREA SERVED	SUPPLY FAN AIRFLOW CFM	SUPPLY FAN MIN/MAX OUTSID AIRFLOW CFM	SUPPLY FAN MIN/MIN OUTSID AIRFLOW CFM	SUPPLY FAN E.S.P. IN. W.G.	SUPPLY FAN T.S.P. IN. W.G.	SUPPLY FAN FAN SPEED RPM	SUPPLY FAN FAN POSITION	SUPPLY FAN WHEEL TYPE	SUPPLY FAN CONTROL TYPE	SUPPLY FAN MOTOR BHP	SUPPLY FAN MOTOR HP	RELIEF OR EXHAUST FAN AIRFLOW CFM	RELIEF OR EXHAUST FAN E.S.P. IN. W.G.	RELIEF OR EXHAUST FAN FAN SPEED RPM	RELIEF OR EXHAUST FAN WHEEL TYPE	RELIEF OR EXHAUST FAN CONTROL TYPE	RELIEF OR EXHAUST FAN MOTOR BHP	RELIEF OR EXHAUST FAN MOTOR HP
RTU-1	CLASSROOM AREA 'K'	11,800	4,200	4,200	1.5	2.77	1536	DRAWTHRU	AF	VAV	3.86 3.86	5.3 5.3	11,000	0.5	1772	AF	VAV	1.4 1.4	2.0 2.0
RTU-2	CLASSROOM AREA 'G'	11,800	4,975	4,975	1.5	2.77	1536	DRAWTHRU	AF	VAV	3.86 3.86	5.3 5.3	11,000	0.5	1772	AF	VAV	1.4 1.4	2.0 2.0
RTU-3	CLASSROOM AREA 'F'	11,800	4,970	4,970	1.5	2.77	1536	DRAWTHRU	AF	VAV	3.86 3.86	5.3 5.3	11,000	0.5	1772	AF	VAV	1.4 1.4	2.0 2.0
RTU-4	CLASSROOM AREA 'C'	10,600	3,700	3,700	2.0	3.2	1586	DRAWTHRU	AF	VAV	4.24 4.24	5.3 5.3	10,500	0.5	1702	AF	VAV	1.25 1.25	2.0 2.0
RTU-5	GYMNASIUM	9,000	2,950	1,950	1.5	3.9	1674	DRAWTHRU	AF	VAV	8.35	10.0	8,800	0.5	1738	AF	VAV	3.7	8.0
RTU-6	MAIN LOBBY/CORRIDORS	9,000	2,040	2,040	2.0	4.2	1690	DRAWTHRU	AF	VAV	8.74	10.0	8,605	0.5	1701	AF	VAV	3.5	8.0
RTU-7	OFFICE AREA	8,430	1,000	1,000	2.3	4.1	1655	DRAWTHRU	AF	VAV	8.21	10.0	8,430	0.5	1669	AF	VAV	3.31	8.0
RTU-8	CLASSROOM AREA 'D'	8,450	2,500	2,500	1.5	3.2	1515	DRAWTHRU	AF	VAV	6.2	7.5	8,075	0.5	1603	AF	VAV	2.96	8.0
RTU-9	POOL OFFICES/CORRIDORS	12,100	4,170	4,170	2.0	3.64	1552	DRAWTHRU	AF	VAV	5.8 5.8	7.0 7.0	12,100	0.5	1928	AF	VAV	1.77 1.77	3.0 3.0
RTU-10	KITCHEN	2,300	910	910	1.0	2.1	1805	DRAWTHRU	AF	CV	1.01	4.0	1,500	0.5	1706	AF	CV	0.25	1.3
RTU-11	AUDITORIUM/DINING	12,950	5,810	500	2.0.	3.98	1681	DRAWTHRU	AF	VAV	7.4 7.4	11.6 11.6	14,000	0.5	1143	AF	VAV	2.58	5.0
RTU-12	MUSIC	1,500	485	485	1.0	2.2	1824	DRAWTHRU	AF	CV	1.04	4.0	1,500	0.5	1706	AF	CV	0.25	1.3
RTU-13	ART/MEDIA CENTER/LIFE SKILLS	6,650	2,560	2,560	2.0	3.4	1443	DRAWTHRU	AF	VAV	5.47	7.5	6,650	0.5	1342	AF	VAV	1.83	4.0

UNIT I.D.	COOLING SECTION-DX MIXED AIR E.D.B. °F	MIXED AIR E.W.B. °F	UNIT LEAVING AIR L.D.B. °F	UNIT LEAVING AIR L.W.B. °F	NET UNIT CAPACITY TOTAL MBH	NET UNIT CAPACITY SENSIBLE MBH	MINIMUM NUMBER OF CIRCUITS	REFRIG. TYPE	HOT GAS REHEAT YES OR NO	MIN. FACE AREA SQ. FT.	MAX. FACE VEL. F.P.M	MAX. A.P.D. IN. W.G.	INTEGRAL AIR-COOLED CONDENSING SECTION DESIGN AMBIENT TEMP. °F	MIN. AMBIENT TEMP. °F	MIN. NO. OF CAPACITY CONTROL STAGES
RTU-1	83.9	68.5	56.3	56.1	434.4	331.6	2	R-410A	YES	26.5	415.1	0.48	95	45	4
RTU-2	83.9	68.5	56.3	56.1	434.4	331.6	2	R-410A	YES	26.5	415.1	0.48	95	45	4
RTU-3	83.9	68.5	56.3	56.1	434.4	331.6	2	R-410A	YES	26.5	415.1	0.48	95	45	4
RTU-4	83.2	68.3	55.5	55.4	429.2	317.5	2	R-410A	YES	26.5	396.2	0.45	95	45	4
RTU-5	80.2	68.2	56.5	56.3	342.9	234.7	1	R-410A	YES	21.4	422.4	0.52	95	45	INVERTER+FIXED
RTU-6	79.5	65.5	55.8	55.6	261.4	223.2	1	R-410A	YES	21.4	402.1	0.46	95	45	INVERTER
RTU-7	79.7	65.5	55.6	55.3	260.7	222.4	1	R-410A	YES	21.7	393.9	0.45	95	45	INVERTER
RTU-8	81.9	68.0	56.0	55.9	207.7	227.8	1	R-410A	YES	27.0	299.1	0.44	95	45	INVERTER+FIXED
RTU-9	82.2	67.4	55.5	55.5	451.1	352.7	2	R-410A	YES	26.5	456.6	0.81	95	45	4
RTU-10	86.2	69.9	54.9	54.8	72.5	51.3	1	R-410A	YES	6.0	248.3	0.31	95	45	INVERTER
RTU-11	81.6	68.6	55.6	55.5	583.3	398.6	2	R-410A	YES	26.5	528.3	1.04	95	45	4
RTU-12	80.2	66.2	55.7	55.7	48.8	40.2	1	R-410A	YES	4.8	310.6	0.36	95	45	INVERTER
RTU-13	82.1	68.2	55.8	55.7	263.1	191.3	1	R-410A	YES	21.4	310.7	0.33	95	45	INVERTER

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE DAIKIN UNLESS OTHERWISE NOTED
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.
4. DESIGN MINIMUM OUTSIDE AIRFLOW CFM (VENTILATION) LISTED IS BASED ON THE ESTIMATED MAXIMUM OCCUPANT LOAD. REFER TO TEMPERATURE CONTROL DRAWINGS FOR OUTSIDE AIR CONTROL SEQUENCE.
5. MERV DESIGNATES THE "MINIMUM EFFICIENCY REPORTING VALUE" AS EVALUATED UNDER ASHRAE STANDARD 52.2 1999.
6. TOTAL STATIC PRESSURE FOR VARIABLE AIR VOLUME SYSTEMS IS BASED ON THE FILTER DIRTY AIR PRESSURE DROP AND AVERAGE/MIDLIFE FILTER AIR PRESSURE DROP FOR CONSTANT VOLUME SYSTEMS UNLESS NOTED OTHERWISE.

GRAVITY RELIEF HOOD SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	CFM	THROAT SIZE INCHES	THROAT VELOCITY FPM	STATIC PRESSURE DROP IN. W.G.	HOOD SIZE WIDTH INCHES	HOOD SIZE LENGTH INCHES	HOOD SIZE HEIGHT INCHES	CURB HEIGHT INCHES	HOOD CONSTRUCTION	MODEL NUMBER	KEYED NOTES
EH-1	EF-1	310	10x10	374	0.05	20	24	14	18	ALUMINUM	FGR	
EH-2	EF-2	520	14x14	382	0.05	24	24	14	18	ALUMINUM	FGR	
EH-3	EF-3	520	14x14	382	0.05	24	24	14	18	ALUMINUM	FGR	
EH-4	EF-4	185	10x10	266	0.05	20	24	14	18	ALUMINUM	FGR	
EH-5	EF-5	520	14x14	382	0.05	24	24	14	18	ALUMINUM	FGR	
EH-6	EF-6	185	10x10	266	0.05	20	24	14	18	ALUMINUM	FGR	
EH-7	EF-7	520	14x14	382	0.05	24	24	14	18	ALUMINUM	FGR	
EH-8	EF-8	330	10x10	476	0.05	20	24	14	18	ALUMINUM	FGR	
EH-9	EF-9	280	10x10	403	0.05	20	24	14	18	ALUMINUM	FGR	
EH-10	EF-10	485	12x12	485	0.05	22	24	14	18	ALUMINUM	FGR	
EH-11	EF-11	520	14x14	382	0.05	24	24	14	18	ALUMINUM	FGR	
EH-12	EF-12	520	14x14	382	0.05	24	24	14	18	ALUMINUM	FGR	
EH-13	EF-13	210	8x8	473	0.05	18	24	14	18	ALUMINUM	FGR	
EH-14	EF-14	280	10x10	403	0.05	20	24	14	18	ALUMINUM	FGR	
EH-15	EF-16	520	14x14	382	0.05	24	24	14	18	ALUMINUM	FGR	
EH-16	EF-17	280	10x10	403	0.05	20	24	14	18	ALUMINUM	FGR	
EH-17	EF-20	430	12x12	430	0.05	22	24	14	18	ALUMINUM	FGR	
EH-18	EF-34	845	16x16	475	0.05	26	36	16	18	ALUMINUM	FGR	
EH-19	EF-35	845	16x16	475	0.05	26	36	16	18	ALUMINUM	FGR	

GENERAL NOTES:
1. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.
2. PROVIDE WITH BIRD SCREEN.

COMMERCIAL ROOFTOP UNIT AIR CONDITIONING SCHEDULE - PART B

UNIT I.D.	HEATING SECTION - GAS FIRED (NATURAL GAS) AIR TEMP. E.A.T. °F	AIR TEMP. L.A.T. °F	CAPACITY (MBH) INPUT	CAPACITY (MBH) OUTPUT	MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	MAXIMUM ALLOWABLE OUTPUT AT MINIMUM FIRING RATE (MBH)	MIN. NO. OF CAPACITY CONTROL STAGES	FILTER SECTION TYPE	MERV	AIR PRESS. DROP INITIAL IN. W.G.	AIR PRESS. DROP FINAL IN. W.G.	CURB TYPE STANDARD	CURB TYPE VIBRATION ISOLATION SPRING CURB	CURB HEIGHT	MAXIMUM UNIT DIMENSIONS LENGTH	HEIGHT (WITH CURB)	WIDTH	MAXIMUM UNIT OPERATING WEIGHT LBS. (WITH CURB)	TOTAL UNIT ELECTRICAL VOLTS	PHASE	MCA	MOP	OPTIONS/ ACCESSORIES	MODEL NO.	KEYED NOTES
RTU-1	37.0	65.0	600	486	7-14	48.6	10	THROW AWAY	8	0.1	0.5	NO	YES	24	265.0	101.6	96.5	12,900	480	3	90.5	100.0	B	DPS035	
RTU-2	37.0	65.0	600	486	7-14	48.6	10	THROW AWAY	8	0.1	0.5	NO	YES	24	265.0	101.6	96.5	12,900	480	3	90.5	100.0	B	DPS035	
RTU-3	37.0	65.0	600	486	7-14	48.6	10	THROW AWAY	8	0.1	0.5	NO	YES	24	265.0	101.6	96.5	12,900	480	3	90.5	100.0	B	DPS035	
RTU-4	41.0	65.0	400	324	7-14	32.4	10	THROW AWAY	8	0.09	0.5	NO	YES	24	265.0	101.6	96.5	12,600	480	3	93.6	100.0	B	DPSA035	
RTU-5	45.2	65.0	450	360	7-14	30.0	12	THROW AWAY	8	0.15	0.5	NO	YES	24	162.3	94.5	76.5	7,600	480	3	69.3	90.0	B	DPS028A	
RTU-6	52.6.	65.0	300	240	7-14	20.0	12	THROW AWAY	8	0.14	0.5	NO	YES	24	162.3	94.5	76.5	7,400	480	3	59.7	80.0	B	DPS020A	
RTU-7	62.3	65.0	300	240	7-14	20.0	12	THROW AWAY	8	0.14	0.5	NO	YES	24	162.3	94.5	76.5	7,400	480	3	59.7	80.0	B	DPS020A	
RTU-8	46.6	65.0	300	240	7-14	20.0	12	THROW AWAY	8	0.13	0.5	NO	YES	24	162.3	94.5	76.5	7,500	480	3	66.5	80.0	B	DPS025A	
RTU-9	45.0	65.0	400	324	7-14	32.4	10	THROW AWAY	8	0.11	0.5	NO	YES	24	265.0	101.6	96.5	13,000	480	3	97.8	110.0	B	DPSA035	
RTU-10	22.5	81.5	120	96	7-14	19.2	5	THROW AWAY	8	0.07	0.5	NO	YES	24	67.0	64.8	87.0	3,500	480	3	14.8	20.0	B	DPS006A	
RTU-11	38.0	65.0	600	486	7-14	48.6	10	THROW AWAY	8	0.13	0.5	NO	YES	24	265.0	101.6	96.5	13,400	480	3	131.8	150	B	DPSA050	
RTU-12	45.5	84.4	80	64.0	7-14	12.8	5	THROW AWAY	8	0.07	0.5	NO	YES	24	67.0	64.8	87.0	3,500	480	3	11.4	15.0	B	DPS004A	
RTU-13	40.2	65.0	300	240	7-14	20.0	12	THROW AWAY	8	0.1	0.5	NO	YES	24	162.3	94.5	76.5	7,400	480	3	54.8	80.0	B	DPS020A	

NOTE: SEE NOTES UNDER PART "A"

COMMERICAL ROOFTOP AIR CONDITIONING UNIT SCHEDULE - PART C (1 OF 2)

SEE PART "B"
SEE PART "C" (2 OF 2)

MAXIMUM SOUND POWER LEVELS

UNIT I.D.	UNIT DISCHARGE Lw BY OCTAVE BAND 63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)	UNIT INLET Lw BY OCTAVE BAND 63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)	CASING RADIATED Lw BY OCTAVE BAND 63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)
RTU-1	81	87	82	84	83	79	75	72	70	60	67	62	64	62	59	70	44	78	83	87	88	86	86	82
RTU-2	81	87	82	84	83	79	75	72	70	60	67	62	64	62	59	70	44	78	83	87	88	86	86	82
RTU-3	81	87	82	84	83	79	75	72	70	60	67	62	64	62	59	70	44	78	83	87	88	86	86	82
RTU-4	82	88	84	85	84	80	77	73	70	60	66	62	64	61	58	70	44	78	83	87	88	86	86	82
RTU-5	84	83	88	83	81	78	73	68	78	77	85	77	72	71	66	63	80	74	76	76	75	72	73	65
RTU-6	85	84	89	84	82	79	74	69	79	78	86	78	73	72	67	64	80	74	76	76	75	72	73	65
RTU-7	84	83	88	83	81	78	73	68	78	77	85	77	72	71	66	63	80	74	76	76	75	72	73	65

NOTE: SEE NOTES UNDER PART "A"

COMMERICAL ROOFTOP AIR CONDITIONING UNIT SCHEDULE - PART C (2 OF 2)

MAXIMUM SOUND POWER LEVELS

UNIT I.D.	UNIT DISCHARGE Lw BY OCTAVE BAND 63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)	UNIT INLET Lw BY OCTAVE BAND 63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)	CASING RADIATED Lw BY OCTAVE BAND 63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)
RTU-8	82	81	86	81	79	76	71	66	76	75	83	75	70	69	64	61	80	74	76	76	75	72	73	65
RTU-9	81	83	90	89	93	87	82	75	70	62	69	64	66	64	61	70	44	78	83	87	88	86	86	82
RTU-10	78	79	87	84	87	81	78	72	78	76	84	79	81	75	80	64	82	82	78	75	73	68	61	54
RTU-11	78	79	90	83	86	82	78	71	70	63	64	59	60	59	55	70	47	78	83	88	89	87	86	82
RTU-12	78	79	87	84	87	81	78	72	78	76	84	79	81	75	70	64	82	82	78	75	73	68	61	54
RTU-13	82	81	86	81	79	76	71	66	76	75	83	75	70	69	64	61	80	74	76	76	75	72	73	65

NOTE: SEE NOTES UNDER PART "A"

INDIRECT FIRED MAKE-UP AIR UNIT SCHEDULE

UNIT I.D.	AREA SERVED	SUPPLY FAN AIRFLOW CFM	MINIMUM OUTSIDE AIR FLOW CFM	E.S.P. IN. W.G.	T.S.P. IN. W.G.	FAN SPEED RPM	BHP	HP	HEATING SECTION - GAS FIRED (NATURAL GAS) AIR TEMP. E.A.T. °F	AIR TEMP. L.A.T. °F	CAPACITY (MBH) INPUT	CAPACITY (MBH) OUTPUT	MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	FILTER SECTION TYPE	MAXIMUM UNIT DIMENSIONS LENGTH (IN.)	HEIGHT (IN.)	WIDTH (IN.)	UNIT ARRANGEMENT	MAXIMUM UNIT OPERATING WEIGHT LBS.	TOTAL UNIT ELECTRICAL VOLTS	PHASE	MCA	MOP	OPTIONS/ ACCESSORIES	MODEL NO.	KEYED NOTES
MAU-1	H101 - KITCHEN	2,040	2,040	1.0	1.25	2117	0.72	1	-10.0	80.8	250	200	6-14	MERV 8	120	39.0	44.25	DB	1,800	480	3	3.5	15.0	15	IGX-109-H12	

GENERAL NOTES:
1. REFER TO SCHEDULE GENERAL NOTES.
2. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED
3. DESIGN MINIMUM OUTSIDE AIRFLOW CFM (VENTILATION) LISTED IS BASED ON THE ESTIMATED MAXIMUM OCCUPANT LOAD. REFER TO TEMPERATURE CONTROL DRAWINGS FOR OUTSIDE AIR CONTROL SEQUENCE.

PACKAGED POOL DEHUMIDIFICATION UNIT SCHEDULE

UNIT IDENT-IFICATION	SUPPLY FAN CFM	MIN. OA CFM SUMMER / WINTER	ESP"	TSP"	CONTROL TYPE	MOTOR BHP	MOTOR HP	EXHAUST FAN CFM SUMMER / WINTER	ESP"	TSP"	CONTROL TYPE	MOTOR BHP	MOTOR HP
DU-1	8,300	4,700/ 3,400	1.0	.66	VFD	7.0	10.0	5,500/ 4,200	0.75	2.48	VFD	3.1	5.0

UNIT IDENT-IFICATION	HEAT EXCHANGER (SUMMER) SUPPLY SIDE E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.	EXHAUST SIDE E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.	HEAT EXCHANGER (WINTER) SUPPLY SIDE E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.	EXHAUST SIDE E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.
DU-1	80.8	87.3	0.66	92.0	86.5	0.86	-10.0	63..3	0.34	92.0	52.7	0.54

UNIT IDENT-IFICATION	COOLING COIL - DX AIRFLOW CFM	TOTAL CAPACITY MBH (TOTAL/ SENSIBLE)	E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.	REFRIG. TYPE	HEATING COIL - NATURAL GAS AIRFLOW CFM	TOTAL INPUT CAPACITY MBH	TOTAL OUTPUT CAPACITY MBH	E.D.T. °F	L.D.T. °F	MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	MAXIMUM A.P.D. FT. HEAD
DU-1	4,700	310.4/ 145.4	87.8	59.8	0.71	R-410A	8,300	300	240	70.9	97.7	6-14	0.41

UNIT IDENT-IFICATION	OUTSIDE AIR FILTERS EFF. %	AREA SQ. FT.	SP" TOTAL	RETURN FILTERS EFF. %	AREA SQ. FT.	SP" TOTAL	CURB TYPE STANDARD	CURB TYPE VIBRATION ISOLATION SPRING CURB (NOTE 5)	CURB HEIGHT	UNIT WEIGHT W/ CURB (LBS.)	SA/RA CONFIG.	EA/OA CONFIG.	ELECTRICAL VOLTS	PHASE	MCA	MOP	OPTIONS/ ACCESS-ORIES	MODEL NO.	KEYED NOTES
DU-1	30	11.11	0.24	30	16.0	0.57	NO	YES	24	14,200	BOTTOM/ BOTTOM	SIDE/ SIDE	480	3	70.2	100	B	NDHU-SS-PL-8300-AC-HG-IF-460	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE INNOVENT UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.
4. COORDINATE UNIT CONFIGURATION WITH PLANS IN ORDER TO ALLOW FOR PROPER SERVICE ACCESS.
5. PROVIDE SINGLE POINT ELECTRICAL CONNECTION WITH MAIN DISCONNECT.
6. REFER TO VIBRATION ISOLATOR APPLICATION SCHEDULE.

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PROJECT TITLE
New High Point School
Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE
MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.
19040

DRAWING NO.
M7.3-BP3

HOT WATER FINNED TUBE RADIATION SCHEDULE

UNIT IDENTIFICATION	CAPACITY BTUH/ LINEAR FT.	ENTERING AIR TEMP °F	FLUID TYPE	WATER TEMP.		ENCLOSURE			ELEMENT				CONTROL VALVE W.P.D. FT. HEAD	MODEL NUMBER	KEYED NOTES
				E.W.T. °F	AVERAGE °F	TYPE	LENGTH INCHES	HEIGHT INCHES	TUBE DIAMETER INCHES	WIDTH INCHES	HEIGHT INCHES	NUMBER OF TIERS			
FTR-1	213	65.0	W	150	145	SLOPE TOP	SEE PLANS	8	3/4	3 1/4	3 1/4	1	11.55	SBG3	

GENERAL NOTES:
1. MODEL NUMBERS ARE RITTLING UNLESS OTHERWISE NOTED.
2. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

HOT WATER CABINET UNIT HEATER SCHEDULE

UNIT IDENTIFICATION	CAPACITY MBH	AIR			FAN		WATER					CONTROL VALVE W.P.D. FT. HEAD	DIMENSIONS			RECESS DEPTH INCHES	FILTER		MODULATION/ CONTROL TYPE	ELECTRICAL			MODEL NUMBER	KEYED NOTES
		AIRFLOW CFM	E.D.B. °F	L.D.B. °F	HP	RPM	FLOW GPM	FLUID TYPE	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D. FT. HEAD		LENGTH INCHES	HEIGHT INCHES	DEPTH INCHES		TYPE	AREA SQ. FT.		VOLTS	PHASE	OPTIONS/ ACCESSORIES		
CUH-1	43.7	1230	60.0	92.8	1/10	1050	2.9	W	150	120	1.2	11.55	73	25	9.5	4	THROW AWAY	3.6	AUTO	120	1	B	RWI-330-12	
CUH-2	27.8	630	60.0	100.6	1/10	1050	1.9	W	150	120	0.3	11.55	59	25	9.5	4	THROW AWAY	2.6	AUTO	120	1	B	RWI-330-06	
CUH-3	27.8	630	60.0	100.6	1/10	1050	1.9	W	150	120	0.3	11.55	59	25	9.5	4	THROW AWAY	2.6	AUTO	120	1	B	RWI-330-06	
CUH-4	43.7	1230	60.0	92.8	1/10	1050	2.9	W	150	120	1.2	11.55	73	25	9.5	4	THROW AWAY	3.6	AUTO	120	1	B	RWI-330-12	
CUH-5	43.7	1230	60.0	92.8	1/10	1050	2.9	W	150	120	1.2	11.55	73	25	9.5	4	THROW AWAY	3.6	AUTO	120	1	B	RWI-330-12	
CUH-6	43.7	1230	60.0	92.8	1/10	1050	2.9	W	150	120	1.2	11.55	73	25	9.5	4	THROW AWAY	3.6	AUTO	120	1	B	RWI-330-12	
CUH-7	69.3	1210	60.0	111.9	1/10	1050	4.6	W	150	120	3.75	11.55	73	25	9.5	4	THROW AWAY	3.6	AUTO	120	1	B	RWI-330-12	4
CUH-8	69.3	1210	60.0	111.9	1/10	1050	4.6	W	150	120	3.75	11.55	73	25	9.5	4	THROW AWAY	3.6	AUTO	120	1	B	RWI-330-12	4
CUH-9	50.7	845	60.0	98.0	1 @ 1/10 1 @ 1/15	1050	3.4	W	150	120	1.4	11.55	61	25	9.5	4	THROW AWAY	2.8	AUTO	120	1	B	RWI-330-08	4

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE RITTLING UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.
4. PROVIDE HIGH CAPACITY, 2-ROW COIL.

HOT WATER PROPELLER FAN UNIT HEATER SCHEDULE

UNIT IDENTIFICATION	CAPACITY MBH	AIRFLOW CFM	LEAVING AIR TEMPERATURE °F	FAN		WATER					CONTROL VALVE W.P.D. FT. HEAD	MODULATION/ CONTROL TYPE	ELECTRICAL			MODEL NUMBER	KEYED NOTES
				HP	RPM	FLOW GPM	FLUID TYPE	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D. FT. HEAD			VOLTS	PHASE	OPTIONS/ ACCESSORIES		
UH-1	30.3	1100	85.4	1/20	1000	2.0	W	150	120	0.23	11.55	AUTO	120	1	B	HV-072B	
UH-2	30.3	1100	85.4	1/20	1000	2.0	W	150	120	0.23	11.55	AUTO	120	1	B	HV-072B	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE VULCAN UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

GAS-FIRED PROPELLER FAN UNIT HEATER SCHEDULE

UNIT IDENTIFICATION	CAPACITY MBH	FAN		FUEL			FINAL AIR TEMPERATURE °F	MOTOR HP	MODULATION/ CONTROL TYPE	ELECTRICAL				MODEL NUMBER	KEYED NOTES
		RPM	CFM	TYPE	MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	INPUT MBH	OUTPUT MBH				VOLTS	PHASE	FLA	OPTIONS/ ACCESSORIES		
GUH-1	135.0	1050	2,850	NATURAL GAS	7/14	175.0	145.25	98.6	1/3	AUTO	120	1	8.0	B	XF-175	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE STERLING UNLESS OTHERWISE NOTED.

ELECTRIC PROPELLER FAN UNIT HEATER SCHEDULE

UNIT IDENTIFICATION	CAPACITY MBH	FAN		HEATING ELEMENT KW	FINAL AIR TEMPERATURE °F	MOTOR HP	MODULATION/ CONTROL TYPE	ELECTRICAL			MODEL NUMBER	KEYED NOTES
		RPM	CFM					VOLTS	PHASE	OPTIONS/ ACCESSORIES		
EUH-1	10.2	1550	380	3	85	1/40	AUTO	208	1	B	HER-30	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE MODINE UNLESS OTHERWISE NOTED.

ENERGY RECOVERY UNIT SCHEDULE

UNIT IDENT-IFICATION	AREA/ SYSTEM SERVED	SUPPLY FAN							EXHAUST FAN						HEAT EXCHANGER (SUMMER)					HEAT EXCHANGER (WINTER)				HEATING COIL - NATURAL GAS						OUTSIDE AIR FILTERS			RETURN FILTERS			ELECTRICAL					CURB		UNIT WEIGHT W/ CURB (LBS.)	SA/RA CONFIG.	EA/OA CONFIG.	MODEL NO.	KEYED NOTES
		CFM	MIN. OA CFM/ %	ESP"	TSP"	CONTROL TYPE	MOTOR		CFM	ESP"	TSP"	CONTROL TYPE	MOTOR		SUPPLY SIDE			EXHAUST SIDE		SUPPLY SIDE			EXHAUST SIDE		TOTAL CAPACITY MBH	E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.	CAPACITY (MBH) (INPUT/ OUTPUT)	MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	EFF. %	AREA SQ. FT.	SP" TOTAL	EFF. %	AREA SQ. FT.	SP" TOTAL	VOLTS	PHASE	MCA	MOP	OPTIONS/ ACCESS-ORIES	TYPE		HEIGHT				
							BHP	HP					BHP	HP	E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.	E.A.T. °F	A.P.D. IN. WG.	E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.	E.A.T. °F	A.P.D. IN. WG.																STANDARD	VIBRATION ISOLATION SPRING CURB (NOTE 7)					
ERU-1	POOL LOCKERS	3,200	3,200	1.0	2.13	VFD	1.52	3.0	3,200	0.5	1.35	VFD	1.08	1.5	91.0	81.3	0.35	75.0	0.35	-10.0	39.5	0.35	72.0	0.35	160.0	39.5	85.6	0.27	200/160	6-14	30	-	0.16	30	-	0.35	480	3	10.9	15.0	B	YES	NO	24	6,700	BOTTOM/ BOTTOM	SIDE/ SIDE	VPRP-210-X-201-C-1XC	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE VALENT UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

HOT WATER RADIANT WALL PANEL SCHEDULE

UNIT IDENTIFICATION	CAPACITY BTUH/ LINEAR FT.	WATER TEMP		DIMENSIONS		FINISH	CONSTRUCTION	CONTROL VALVE W.P.D. FT. HEAD	MODEL NUMBER	REMARKS
		E.W.T. °F	L.W.T. °F	LENGTH INCHES	HEIGHT INCHES					
RWP-1	349	150	130	SEE PLANS	5 3/4	BY ARCHITECT	STEEL	11.55	UFLT-2	
RWP-2	210	150	130	SEE PLANS	2 3/4	BY ARCHITECT	STEEL	11.55	RF-1	
RWP-3	451	150	130	SEE PLANS	8 5/8	BY ARCHITECT	STEEL	11.55	UFLT-3	
RWP-4	544	150	130	SEE PLANS	11 1/2	BY ARCHITECT	STEEL	11.55	UFLT-4	

NOTE:
1. MODEL NUMBERS ARE RUNTAL UNLESS OTHERWISE NOTED.
2. PROVIDE VERTICAL PIPE TRIMS, END CAPS, AND CORNER TRIM ACCESSORIES.
3. ARCHITECT TO SELECT FINISH FROM MANUFACTURERS STANDARD COLORS.

HOT WATER RADIANT CEILING PANEL SCHEDULE

UNIT IDENTIFICATION	CAPACITY BTUH/ LINEAR FT.	FLUID TYPE	WATER TEMP		DIMENSIONS		FINISH	CONSTRUCTION	CONTROL VALVE W.P.D. FT. HEAD	MODEL NUMBER	KEYED NOTES
			E.W.T. °F	L.W.T. °F	LENGTH INCHES	WIDTH INCHES					
RCP-1	264	W	150	130	SEE PLANS	24	BY ARCHITECT	ALUMINUM	11.55	LRCP	

GENERAL NOTES:
1. MODEL NUMBERS ARE ZEHNDER RITTLING UNLESS OTHERWISE NOTED.
2. EXTRUDED ARCHITECTURAL SPACE MASTERY SERIES HEF-2 FLUTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

AIR & DIRT SEPARATOR SCHEDULE

INLET/OUTLET PIPE SIZE (INCHES)	MAX SYSTEM FLOW (GPM)	MAX PRESSURE DROP CLEAN (FT HD)	BUNDLE REMOVAL CLEARANCE NOTE 3 (INCHES)	OPERATING WEIGHT (LBS)	TYPE	MODEL NUMBER	KEYED NOTES
2	35	0.70	12	115	STANDARD VELOCITY / AIR & DIRT	VDN 200 FA	
2 1/2	57	0.7	12	160	STANDARD VELOCITY / AIR & DIRT	VDN 250 FA	
3	110	0.85	16	210	STANDARD VELOCITY / AIR & DIRT	VDN 300 FA	
4	220	1.10	16	250	STANDARD VELOCITY / AIR & DIRT	VDN 400 FA	
6	540	1.30	25	400	STANDARD VELOCITY / AIR & DIRT	VDN 600 FA	
	650	3.75	43	400	HIGH VELOCITY / AIR & DIRT	VHN 600 FA	
8	940	1.40	33	775	STANDARD VELOCITY / AIR & DIRT	VDN 800 FA	
	1280	5.9	55	775	HIGH VELOCITY / AIR & DIRT	VHN 800 FA	
10	1470	1.60	44	1,165	STANDARD VELOCITY / AIR & DIRT	VDN 1000 FA	
	2280	8.5	68	1,165	HIGH VELOCITY / AIR & DIRT	VHN 1000 FA	
12	2090	2.00	54	1,785	STANDARD VELOCITY / AIR & DIRT	VDN 1200 FA	
	3500	11.50	80	1,785	HIGH VELOCITY / AIR & DIRT	VHN 1200 FA	

GENERAL NOTES:
1. MODEL NUMBERS ARE SPIROTHERM UNLESS OTHERWISE NOTED.
2. SEPARATOR FLANGE CONNECTION MUST BE A MINIMUM OF THE PIPE DIAMETER SIZE OF WHICH THE SEPARATOR IS INSTALLED.
3. MINIMUM BUNDLE REMOVAL CLEARANCE IS MEASURED FROM CENTERLINE OF INLET/OUTLET PIPING. PROVIDE CLEARANCE BELOW UNIT TO DIMENSION LISTED TO ALLOW REMOVAL OF HEAD AND ELEMENT BUNDLE.
4. REFER TO PUMP SCHEDULE FOR SYSTEM FLOW.

EXPANSION TANK SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	ESTIMATED TOTAL SYSTEM VOLUME GALLON	FLUID TYPE	TYPE	OPERATING PRESSURE		OPERATING TEMPERATURE		TANK VOLUME GALLON	ACCEPTANCE VOLUME GALLON	DIMENSIONS		MODEL NUMBER	KEYED NOTES
					MINIMUM PSIG	MAXIMUM PSIG	MINIMUM °F	MAXIMUM °F			DIAMETER INCHES	HEIGHT INCHES		
ET-1	HWH SYSTEM	3153	W	BLADDER	11	50	40	150	94	56	24	64-3/4	B-400	
ET-2	---	---	---	---	---	---	---	---	---	---	---	---	---	NOTE 3
ET-3	DWH-1&2	1200	W	DIAPHRAGM	65	80	40	140	60	40	24	50	PTA-125V	
ET-4	DWH-3	150	W	DIAPHRAGM	65	80	40	140	22	14	16	31	PTA-42V	

GENERAL NOTES:
1. MODEL NUMBERS ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
2. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.
3. REFER TO PACKAGED SNOW MELT SYSTEM SCHEDULES.

THERMOSTATIC MIXING VALVE SCHEDULE

UNIT IDENTIFICATION	MINIMUM FLOW GPM	MAXIMUM FLOW GPM	PRESSURE DROP AT MAXIMUM FLOW PSIG	MODEL NUMBER	KEYED NOTES
MV-1	0.25	80	5	S-NV-200-LF-M	A

GENERAL NOTES:
1. MODEL NUMBERS ARE LEONARD UNLESS OTHERWISE NOTED.

KEYED NOTES:
A. REFER TO PUMP SCHEDULE FOR REQUIRED PUMP TO INCLUDE WITH MIXING VALVE ASSEMBLY.

PLUMBING CONNECTION SCHEDULE

UNIT IDENTIFICATION	CW INCHES	HW INCHES	SAN INCHES	VENT INCHES	KEYED NOTES
UR-1	3/4	-	2	1 1/2	
WC-1,2,3	1 1/2	-	4	-	
LAV-1,2,3,4	1/2	1/2	1 1/2	1 1/2	
SK-1,2,3,4,5	3/4	3/4	1 1/2	1 1/2	
SS-1	3/4	3/4	3	-	
SS-2	3/4	3/4	3	1 1/2	
EWC-1	1/2	-	1 1/2	1 1/2	
SH-1,2	3/4	3/4	-	-	1
WMSD-1	3/4	3/4	3	1 1/2	
OB-1	3/4	-	-	-	
WH-1	3/4	-	-	-	
FD-1	-	-	3	-	
FD-2	-	-	4	-	
FS-1	-	-	3	-	
HO-1	-	-	4	-	

GENERAL NOTES:
1. INDIVIDUAL WATER LINE BRANCHES, WASTE LINES, VENTS, AND TRAPS FOR CONNECTION TO INDIVIDUAL FIXTURES, FIXTURE FITTINGS, AND SPECIALTIES SHALL BE IN ACCORDANCE WITH THE FOLLOWING SCHEDULE OR AS INDICATED ON DRAWINGS, WHICHEVER IS GREATER.

KEYED NOTES:
1. PROVIDE MIXING VALVE.

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PROJECT TITLE

New High Point School
Washtenaw Intermediate School District
1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

MECHANICAL SCHEDULES

ISSUE DATES

05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M7.4-BP3

FUEL FIRED DOMESTIC WATER HEATER SCHEDULE

UNIT IDENTIFICATION	STORAGE CAPACITY GALLONS	FUEL			RECOVERY GPH	E.W.T. °F	L.W.T. °F	MODULATION/ CONTROL TYPE	ELECTRICAL					MODEL NUMBER	KEYED NOTES
		TYPE	MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	INPUT MBH					VOLTS	PHASE	FLA	MOP	OPTIONS/ ACCESSORIES		
DWH-1	576	NAT. GAS	4-14"	399	465	40	140	AUTO	120	1	6.5	15.0	B	AW-400-PM	
DWH-2		NAT. GAS	4-14"	399	465	40	140	AUTO	120	1	6.5	15.0	B	AW-400-PM	
DWH-3	90	NAT. GAS	4-14"	199	221	40	140	AUTO	120	1	3.2	15.0	B	SNA201-100	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE LOCHINVAR UNLESS OTHERWISE NOTED.

PUMP SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	LOCATION	TYPE	COUPLING TYPE	WATERFLOW GPM	FLUID TYPE	COLDEST SYSTEM OPERATING TEMP. °F FOR PUMP SELECTION	PUMP HEAD FT.	OVERLOAD GPM	MINIMUM EFFICIENCY %	MOTOR			MODULATION/ CONTROL TYPE	ELECTRICAL			MODEL NUMBER	KEYED NOTES
											BHP	HP	RPM		VOLTS	PHASE	OPTIONS/ ACCESSORIES		
CP-1	B-1	MECH. ROOM	INLINE	CLOSE	92	W	40	20	NON-OVERLOADING	74.1	0.662	0.75	1800	AUTO	480	3	---	E-90 2AAC	
CP-2	B-2	MECH. ROOM	INLINE	CLOSE	92	W	40	20	NON-OVERLOADING	74.1	0.662	0.75	1800	AUTO	480	3	---	E-90 2AAC	
CP-3	B-3	MECH. ROOM	INLINE	CLOSE	92	W	40	20	NON-OVERLOADING	74.1	0.662	0.75	1800	AUTO	480	3	---	E-90 2AAC	
CP-4	B-4	MECH. ROOM	INLINE	CLOSE	92	W	40	20	NON-OVERLOADING	74.1	0.662	0.75	1800	AUTO	480	3	---	E-90 2AAC	
CP-5	HWH SYSTEM	MECH. ROOM	BASE-MOUNTED	FLEXIBLE	370	W	40	65	NON-OVERLOADING	73.6	7.57	10	1800	VFC	480	3	---	E-1510-3BD	
CP-6	HWH SYSTEM	MECH. ROOM	BASE-MOUNTED	FLEXIBLE	370	W	40	65	NON-OVERLOADING	73.6	7.57	10	1800	VFC	480	3	---	E-1510-3BD	STAND BY
CP-9	DOM. HW	MECH. ROOM	IN-LINE	CLOSE	28.8	WATER	40	50	NON-OVERLOADING	–	–	–	1	4600	VFC	208	1	B	ECOCIRC XL N 65-130	
CP-10	140°F HW	MECH. ROOM	IN-LINE	CLOSE	1.2	WATER	40	15	NON-OVERLOADING	–	–	–	1/6	4600	VFC	120	1	B	ECOCIRC XL N 36-45	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBER ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

PACKAGED BOOSTER PUMP SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	LOCATION	TYPE	NUMBER OF PUMPS	DISCHARGE WATERFLOW GPM EACH	PUMP INLET PRESSURE HEAD PSIG EACH	PUMP DISCHARGE PRESSURE HEAD PSIG	PUMP MODEL NUMBER	OVERLOAD GPM	MOTOR		CAPACITY CONTROL	MODULATION/ CONTROL TYPE	ELECTRICAL			MODEL NUMBER	KEYED NOTES
										RPM EACH	HP EACH			VOLTS	PHASE	OPTIONS/ ACCESSORIES		
BP-1	DOM. WATER	MECH. ROOM	DUPLEX	2	163	30	65	33SV10	–	3600	7.5	PRESSURE SENSOR	VFC	480	3	B	FG-HVL2D4-33SV10GH4F60-2BD	A

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.

KEYED NOTES:
A. PROVIDE WITH 106 GALLON HYDROPNEUMATIC TANK. BELL & GOSSETT MODEL WTA-449.

DUCT SILENCER SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	AIRFLOW CFM	A.P.D. IN. W.G.	MAX P.D. IN W.G.	VELOCITY AT DIL RATING FPM	DYNAMIC INSERTION LOSS (DIL) dB								DIMENSIONS			CONSTRUCTION					MODEL NUMBER	KEYED NOTES
						63	125	250	500	1K	2K	4K	8K	W INCHES	H INCHES	L INCHES	TYPE	OUTER CASING TYPE	FILL MATERIAL	LINER	CASING MATERIAL		
DS-1S	RTU-1	11,000	0.18	0.18	1714	9	11	12	20	23	27	22	17	22	42	84	RE	18	FIBERGLASS	NO	GV	REA-44V80	
DS-2S	RTU-2	11,000	0.18	0.18	1714	9	11	12	20	23	27	22	17	22	42	84	RE	18	FIBERGLASS	NO	GV	REA-44V80	
DS-3S	RTU-3	11,000	0.18	0.18	1714	9	11	12	20	23	27	22	17	22	42	84	RE	18	FIBERGLASS	NO	GV	REA-44V80	
DS-4S	RTU-4	10,600	0.18	0.18	1714	9	11	12	20	23	27	22	17	22	42	84	RE	18	FIBERGLASS	NO	GV	REA-44V80	
DS-5S	RTU-5	9,000	0.18	0.19	800	6	10	13	13	17	16	15	12	54	30	24	RS	22	FIBERGLASS	NO	GV	RSA-28V20	
DS-5R	RTU-5	8,800	0.15	0.16	-880	5	9	18	29	32	29	25	14	48	30	48	RS	22	FIBERGLASS	NO	GV	RSA-15V40	
DS-6S	RTU-6	9,000	0.12	0.19	1636	2	4	7	8	9	8	9	7	36	22	24	RS	22	FIBERGLASS	NO	GV	RSA-36V60	
DS-7S	RTU-7	7,600	0.17	0.21	1629	6	8	10	22	25	56	20	18	28	24	60	RE	16	FIBERGLASS	NO	GV	REA-28V98	
DS-7R1	RTU-7	4,695	0.06	0.13	-939	6	6	8	15	17	17	11	12	30	24	48	RE	18	FIBERGLASS	NO	GV	REA-30V98	
DS-7R2	RTU-7	3,175	0.05	0.11	-866	9	8	6	14	12	15	12	10	22	24	36	RE	22	FIBERGLASS	NO	GV	REA-44V80	
DS-8S	RTU-8	8,450	0.24	0.24	1901	11	17	20	28	36	32	25	22	20	32	108	RE	18	FIBERGLASS	NO	GV	REA-40V80	
DS-8R1	RTU-8	3,600	0.20	0.20	-938	12	15	13	20	17	19	17	13	24	24	36	RE	22	FIBERGLASS	NO	GV	REA-48V50	
DS-8R2	RTU-8	3,700	0.20	0.20	-925	12	15	13	20	17	19	17	13	24	24	36	RE	22	FIBERGLASS	NO	GV	REA-48V50	
DS-9S	RTU-9	12,070	0.21	0.27	1646	6	11	15	26	33	34	28	22	24	44	84	RE	16	FIBERGLASS	NO	GV	REA-24V98	
DS-10S	RTU-10	1,500	0.23	0.23	750	9	16	27	36	40	41	30	21	12	24	72	RE	16	FIBERGLASS	NO	GV	REA-24V40	
DS-10R	RTU-10	595	0.07	0.07	-357	6	12	17	25	30	18	24	17	12	20	24	RE	16	FIBERGLASS	NO	GV	REA-24V30	
DS-11S	RTU-11	14,000	0.16	0.20	1680	11	18	14	23	33	30	22	19	24	50	108	RE	22	FIBERGLASS	NO	GV	REA-48V80	
DS-11R	RTU-11	12,680	0.12	0.13	-845	7	11	19	24	37	38	28	22	30	72	60	RE	22	FIBERGLASS	NO	GV	REA-15V70	
DS-12S	RTU-12	1,500	0.12	0.12	375	11	20	34	38	43	40	32	26	16	36	60	RE	16	FIBERGLASS	NO	GV	REA-32V12	
DS-12R	RTU-12	1,425	0.04	0.04	-356	9	12	13	21	23	21	17	15	16	36	36	RE	16	FIBERGLASS	NO	GV	REA-32V50	
DS-13S	RTU-13	6,585	0.20	0.25	1580	8	9	8	19	20	23	18	15	20	30	60	RE	16	FIBERGLASS	NO	GV	REA-40V80	
DS-13R	RTU-13	6,210	0.04	0.04	-932	5	6	5	11	10	15	10	10	24	40	36	RE	16	FIBERGLASS	NO	GV	REA-48V98	
DS-DUS	DU-1	8,300	0.16	0.21	1034	10	13	18	29	29	30	24	20	34	34	84	RE	16	FIBERGLASS	NO	AL	REA-34V70	
DS-DUR	DU-1	9,100	0.10	0.10	-582	14	15	18	27	25	26	21	17	40	34	60	RE	20	FIBERGLASS	NO	AL	REA-40V50	

GENERAL NOTES:
1. DUCT SILENCER MODEL NUMBERS ARE BASED ON VAW SYSTEMS UNLESS OTHERWISE NOTED.
2. LENGTH SHOWN FOR ELBOW SILENCERS IS CENTERLINE LENGTH.
3. VELOCITY SHOWN IS +(FORWARD FLOW) OR -(REVERSE FLOW) AS DEFINED BY ASTM E477-99.
4. PRESSURE DROP, DYNAMIC INSERTION LOSS AND SELF GENERATED NOISE PER ASTM E477-99.
5. MAXIMUM PRESSURE DROP WITH SYSTEM EFFECTS = SILENCER PRESSURE DROP PER ASTM E477-99 + SYSTEM EFFECTS FOR NEARBY DUCT ELEMENTS.
6. TYPE: RS = RECTANGULAR STRAIGHT; RE = RECTANGULAR ELBOW; REE = RECTANGULAR EXTENDED ELBOW; CS = CIRCULAR STRAIGHT; CE = CIRCULAR ELBOW.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

UNIT IDENTIFICATION	TYPE	FACE SIZE	NECK SIZE	FRAME TYPE	ACCESSORY	CONSTRUCTION	FINISH	MODEL NUMBER	KEYED NOTES
S-1	DIFFUSER	24x24	SEE PLANS	NOTE 2	–	STEEL	WHITE	SPD	
S-2	DIFFUSER	48x24	SEE PLANS	NOTE 2	–	ALUMINUM	WHTIE	LFD	
S-3	DIFFUSER	12x12	SEE PLANS	NOTE 2	–	STEEL	WHITE	SPD	
S-4	DIFFUSER	48x2	SEE PLANS	NOTE 2	–	STEEL	WHITE	TBD3	1
S-5	DIFFUSER	NECK SIZE + 2-1/4"	SEE PLANS	NOTE 2	–	ALUMINUM	WHITE	RSG	
S-6	DIFFUSER	NECK SIZE + 1"	SEE PLANS	DUCT MOUNTED	O.B.D.	ALUMINUM	WHITE	SDGE	
S-7	DIFFUSER	NECK SIZE + 1 3/4	SEE PLANS	SURFACE	–	STEEL	WHITE	520	
S-8	DIFFUSER	48x2	SEE PLANS	NOTE 2	–	STEEL	KEY NOTE 2	TBD3	1, 2
S-9	DIFFUSER	24x24	SEE PLANS	NOTE 2	–	ALUMINUM	WHITE	ASPD	
S-10	DIFFUSER	12x12	SEE PLANS	NOTE 2	–	ALUMINUM	WHITE	ASPD	
R-1	GRILLE	24x24	22x22	NOTE 2	–	STEEL	WHITE	PDDR	
R-2	GRILLE	24x12	22x10	NOTE 2	–	STEEL	WHITE	PDDR	
R-3	GRILLE	NECK SIZE + 1 3/4	SEE PLANS	SURFACE	–	STEEL	WHITE	530	
R-4	GRILLE	SEE DETAIL	SEE PLANS	SURFACE	---	STEEL	NOTE 2	NOTE 3	
E-1	GRILLE	12x12	SEE PLANS	NOTE 2	–	STEEL	WHITE	PDDR	
E-2	GRILLE	24x24	SEE PLANS	NOTE 2	–	STEEL	WHITE	PDDR	
E-3	GRILLE	NECK SIZE + 1 3/4	SEE PLANS	SURFACE	–	STEEL	WHITE	530	
E-4	GRILLE	24x24	SEE PLANS	NOTE 2	–	ALUMINUM	WHITE	APDDR	
E-5	GRILLE	12x12	SEE PLANS	NOTE 2	–	ALUMINUM	WHITE	APDDR	
E-3	GRILLE	NECK SIZE + 1 3/4	SEE PLANS	SURFACE	–	ALUMINUM	WHITE	630	
T-1	GRILLE	NECK SIZE + 1 3/4	SEE PLANS	SURFACE	---	ALUMINUM	WHITE	630	
T-1	GRILLE	NECK SIZE + 1 3/4	SEE PLANS	SURFACE	---	ALUMINUM	WHITE	97	

GENERAL NOTES:
1. MODEL NUMBERS ARE TITUS UNLESS OTHERWISE NOTED.
2. COORDINATE EXACT FRAME TYPE WITH ARCHITECTURAL TRADES.

KEYED NOTES:
1. 2 SLOT – 1" SLOT WIDTH
2. COORDINATE FINISH WITH ARCHITECTURAL TRADES.
3. REFER TO DETAIL SHEET FOR HEAVY DUTY RETURN AIR GRILLE.

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
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DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.
19040

DRAWING NO.
M7.5-BP3

GAS FIRED BOILER SCHEDULE

UNIT IDENTIFICATION	NUMBER OF CONTROL STAGES	FUEL		AGA INPUT MBH	AGA OUTPUT MBH	PRESSURE RATING PSIG	DIMENSIONS INCHES			WATER				MODULATION/ CONTROL TYPE	ELECTRICAL					MODEL NUMBER	REMARKS
		TYPE	INLET PRESSURE AT GAS TRAIN INCH W.C.				LENGTH	WIDTH	HEIGHT	E.W.T. °F	L.W.T. °F	FLOW GPM	W.P.D. FT		VOLTS	PHASE	FLA	MOP	OPTIONS/ ACCESSORIES		
B-1	MODULATING 5:1	NAT. GAS	7 – 14	2000	1800	125	56.0	35.8	79.9	120	159.1	92.0	2	AUTO	120	1	15.5	20	A	CFC-E 2000	
B-2	MODULATING 5:1	NAT. GAS	7 – 14	2000	1800	125	56.0	35.8	79.9	120	159.1	92.0	2	AUTO	120	1	15.5	20	A	CFC-E 2000	
B-3	MODULATING 5:1	NAT. GAS	7 – 14	2000	1800	125	56.0	35.8	79.9	120	159.1	92.0	2	AUTO	120	1	15.5	20	A	CFC-E 2000	
B-4	MODULATING 5:1	NAT. GAS	7 – 14	2000	1800	125	56.0	35.8	79.9	120	159.1	92.0	2	AUTO	120	1	15.5	20	A	CFC-E 2000	

NOTE:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE CLEAVER-BROOKS UNLESS OTHERWISE NOTED.
3. BOILERS ARE EACH SIZED AT 1/4 OF THE ANTICIPATED BUILDING LOAD.
4. PROVIDE BOILER WITH CONDENSATE NEUTRALIZATION TANK ASSEMBLY.

POWER VENTILATOR SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	AIRFLOW CFM	T.S.P. IN. W.G.	TIP SPEED FPM	FAN RPM	MOTOR				CURB HEIGHT INCHES	MODULATION/ CONTROL TYPE	ELECTRICAL			UNIT INLET Lw BY OCTAVE BAND								MODEL NUMBER	KEYED NOTES
							BHP	HP	RPM	DRIVE TYPE			VOLTS	PHASE	OPTIONS/ ACCESSORIES	63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)		
EF-1	K11A	CENTRIFUGAL	310	0.3	4,375	1537	0.05	1/10	1725	DIRECT	N/A	AUTO	120	1	B	66	73	68	60	60	57	52	45	SQ-80-VG	
EF-2	K112A/K113A	CENTRIFUGAL	520	0.4	4,272	1500	0.09	1/6	1725	DIRECT	N/A	AUTO	120	1	B	79	76	71	63	58	50	41	38	SQ-95-VG	
EF-3	K103A/K104A	CENTRIFUGAL	520	0.4	4,272	1500	0.09	1/6	1725	DIRECT	N/A	AUTO	120	1	B	79	76	71	63	58	50	41	38	SQ-95-VG	
EF-4	K101/K114/K115	CENTRIFUGAL	185	0.3	3,589	1261	0.03	1/10	1725	DIRECT	N/A	AUTO	120	1	B	64	69	63	56	54	52	45	38	SQ-80-VG	
EF-5	G113A/G114A	CENTRIFUGAL	520	0.4	4,272	1500	0.09	1/6	1725	DIRECT	N/A	AUTO	120	1	B	79	76	71	63	58	50	41	38	SQ-95-VG	
EF-6	G101/G115/G116	CENTRIFUGAL	185	0.3	3,496	1644	0.03	1/15	1725	DIRECT	N/A	AUTO	120	1	B	67	69	67	53	48	47	42	37	SQ-70-VG	
EF-7	G103/G104A	CENTRIFUGAL	520	0.4	4,272	1500	0.09	1/6	1725	DIRECT	N/A	AUTO	120	1	B	79	76	71	63	58	50	41	38	SQ-95-VG	
EF-8	F110A/F112A/F112B	CENTRIFUGAL	330	0.3	3,685	1294	0.04	1/10	1725	DIRECT	N/A	AUTO	120	1	B	66	67	63	56	53	52	49	42	SQ-90-VG	
EF-9	F107A/F109A	CENTRIFUGAL	280	0.3	3,514	1234	0.03	1/10	1725	DIRECT	N/A	AUTO	120	1	B	66	67	63	56	52	52	47	40	SQ-90-VG	
EF-10	F101/F113/F114	CENTRIFUGAL	485	0.4	4,642	1630	0.08	1/10	1725	DIRECT	N/A	AUTO	120	1	B	73	73	71	63	59	57	54	47	SQ-90-VG	
EF-11	F103A/F104A	CENTRIFUGAL	520	0.4	4,272	1500	0.09	1/6	1725	DIRECT	N/A	AUTO	120	1	B	79	76	71	63	58	50	41	38	SQ-95-VG	
EF-12	F105A/F106A	CENTRIFUGAL	520	0.4	4,272	1500	0.09	1/6	1725	DIRECT	N/A	AUTO	120	1	B	79	76	71	63	58	50	41	38	SQ-95-VG	
EF-13	C116	CENTRIFUGAL	210	0.3	3,725	1308	0.03	1/10	1725	DIRECT	N/A	AUTO	120	1	B	64	70	64	57	55	53	47	40	SQ-80-VG	
EF-14	C111A/C113A	CENTRIFUGAL	280	0.3	3,514	1234	0.03	1/10	1725	DIRECT	N/A	AUTO	120	1	B	66	67	63	56	52	52	47	40	SQ-90-VG	
EF-15	C118/C119/C120	CENTRIFUGAL	190	0.3	3,067	1442	0.02	1/15	1725	DIRECT	18	AUTO	120	1	B	66	66	61	48	42	40	36	32	G-070-VG	
EF-16	C106A/C107A	CENTRIFUGAL	520	0.4	4,272	1500	0.09	1/6	1725	DIRECT	N/A	AUTO	120	1	B	79	76	71	63	58	50	41	38	SQ-95-VG	
EF-17	C108A/C110A	CENTRIFUGAL	280	0.3	3,514	1234	0.03	1/10	1725	DIRECT	N/A	AUTO	120	1	B	66	67	63	56	52	52	47	40	SQ-90-VG	
EF-18	B102/B104	CENTRIFUGAL	420	0.4	3,966	1393	0.05	1/10	1725	DIRECT	18	AUTO	120	1	B	70	70	65	58	55	53	50	43	G-090-VG	
EF-19	A119/A120	CENTRIFUGAL	140	0.3	2,895	1361	0.02	1/15	1725	DIRECT	18	AUTO	120	1	B	65	64	59	46	40	38	34	30	G-070-VG	
EF-20	D101/D102/D103/ D104/D113/D115	CENTRIFUGAL	430	0.4	4,003	1406	0.06	1/10	1725	DIRECT	18	AUTO	120	1	B	71	70	66	59	55	53	50	43	G-090-VG	
EF-21	E103F	CENTRIFUGAL	120	0.3	2,843	1337	0.01	1/15	1725	DIRECT	18	AUTO	120	1	B	65	64	58	46	39	38	33	29	G-070-VG	
EF-22	E117A	CENTRIFUGAL	70	0.3	3,167	1489	0.01	1/15	1725	DIRECT	18	AUTO	120	1	B	57	60	58	48	46	47	39	32	G-060-VG	
EF-23	H104/H105	CENTRIFUGAL	700	0.5	4,653	1634	0.14	1/6	1725	DIRECT	18	AUTO	120	1	B	81	79	73	66	62	59	50	43	G-095-VG	
EF-24	H101	CENTRIFUGAL	1040	0.5	4,442	1525	0.2	1/4	1725	DIRECT	18	AUTO	120	1	B	70	71	74	67	60	58	53	46	G-103-VG	
EF-25	KITCHEN HOOD	CENTRIFUGAL	2550	1.0	5,507	1265	0.76	1	1725	DIRECT	18	MANUAL	208	1	B	74	81	80	79	71	69	65	62	CUE-161-VG	
EF-26	DISHWASHER HOOD	CENTRIFUGAL	600	0.4	4,687	1646	0.08	1/10	1725	DIRECT	18	MANUAL	120	1	B	73	73	71	63	59	57	54	47	G-090-VG	
EF-27	H108A	CENTRIFUGAL	170	0.3	2,976	1599	0.02	1/15	1725	DIRECT	18	AUTO	120	1	B	65	65	60	47	41	39	35	31	G-070-VG	NOTE 4
EF-28	H101A	CENTRIFUGAL	120	0.3	2,843	1337	0.01	1/15	1725	DIRECT	18	AUTO	120	1	B	65	64	58	46	39	38	33	29	G-070-VG	
EF-29	J102/J103/J104A/ J104B	CENTRIFUGAL	280	0.4	3,669	1725	0.03	1/15	1725	DIRECT	18	AUTO	120	1	B	68	71	69	54	50	48	43	38	G-070-VG	
EF-30	J101	CENTRIFUGAL	920	0.5	4,582	1564	0.18	1/4	1725	DIRECT	18	MANUAL	120	1	B	73	77	77	69	65	63	58	52	G-099-VG	NOTE 3
EF-31	J106A/J106B/J107A/ J107B	CENTRIFUGAL	400	0.5	4,229	1485	0.07	1/10	1725	DIRECT	18	AUTO	120	1	B	75	73	67	61	57	54	50	43	G-090-VG	
EF-32	POOL STORAGE	CENTRIFUGAL	1,100	0.75	4,045	1030	0.24	1/3	1725	BELT	18	AUTO	120	1	B	77	75	68	66	65	57	52	46	USF-15	NOTE 5
EF-33	118B	CENTRIFUGAL	410	0.5	3,667	1334	0.09	1/4	1725	BELT	18	AUTO	120	1	B	74	78	66	60	62	56	48	40	USF-08	NOTE 5
EF-34	G105	CENTRIFUGAL	945	0.5	4,702	1390	0.13	1/4	1725	DIRECT	N/A	MANUAL	120	1	B	65	69	66	66	62	58	50	48	SQ-100-VG	NOTE 3
EF-35	G108	CENTRIFUGAL	845	0.5	4,702	1390	0.13	1/4	1725	DIRECT	N/A	MANUAL	120	1	B	65	69	66	66	62	58	50	48	SQ-100-VG	NOTE 3
EF-36	J108	CENTRIFUGAL	290	0.4	3,604	1266	0.04	1/10	1725	DIRECT	18	MANUAL	120	1	B	67	69	63	56	53	50	49	44	G-090-VG	NOTE 3
EF-37	H108	CENTRIFUGAL	1,800	0.4	4,909	1429	0.14	1/2	1725	DIRECT	18	AUTO	208	1	B	76	78	83	73	68	66	61	56	G-133-VG	NOTE 4
EF-38	E107	CENTRIFUGAL	850	0.4	4,183	1428	0.14	1/4	1725	DIRECT	18	AUTO	120	1	B	72	75	75	67	63	61	55	49	G-099-VG	NOTE 4
EF-39	F116	CENTRIFUGAL	850	0.4	4,183	1428	0.14	1/4	1725	DIRECT	18	AUTO	120	1	B	72	75	75	67	63	61	55	49	G-099-VG	NOTE 4
EF-40	EXIST. GYM STORAGE/ J.C./ ELECT. RM.	CENTRIFUGAL	1,000	0.3	4,481	1530	0.17	1/4	1725	DIRECT	18	AUTO	120	1	B	73	76	77	69	65	54	59	52	G-099-VG	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWSE NOTED.
3. PROVIDE UNIT WITH 2 HOUR MAX TWIST TIMER.
4. PROVIDE T-STAT.
5. PROVIDE CORROSION RESISTANT EXHAUST FAN.

FAN SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	AIRFLOW CFM	T.S.P. IN. W.G.	MINIMUM WHEEL DIAMETER INCHES	RPM	CLASS	MOTOR			MODULATION/ CONTROL TYPE	ELECTRICAL			MODEL NUMBER	KEYED NOTES
								HP (WATTS)	RPM	DRIVE TYPE		VOLTS	PHASE	OPTIONS/ ACCESSORIES		
DBF-1	C104	INLINE	188	---	---	2,175	B	65	rpm	DIRECT	AUTO	120	1	---	DBF 4XL	
DBF-2	F113	INLINE	188	---	---	2,175	B	65	rpm	DIRECT	AUTO	120	1	---	DBF 4XL	
DBF-3	G102	INLINE	188	---	---	2,175	B	65	rpm	DIRECT	AUTO	120	1	---	DBF 4XL	
DBF-4	K102	INLINE	188	---	---	2,175	B	65	rpm	DIRECT	AUTO	120	1	---	DBF 4XL	
DBF-5	J108	INLINE	188	---	---	2,175	B	65	rpm	DIRECT	AUTO	120	1	---	DBF 4XL	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE FANTECH UNLESS OTHERWISE NOTED.
3. PROVIDE DBLT4W SECD LINT TRAP.

HORIZONTAL PIPING AND SUPPORT APPLICATION SCHEDULE

METAL PIPE TYPE & SIZE	HANGER OR SUPPORT TYPE						SHIELD TYPE			KEYED NOTES
	MSS TYPE 1 CLEVIS HANGER	MSS TYPE 10 SWIVEL RING BAND HANGER	MSS TYPE 41 DOUBLE ROD PIPE ROLLER	MSS TYPE 43 SINGLE ROD ROLLER HANGER	MSS TYPE 44 PIPE ROLLER & STAND	MSS TYPE 46 ADJUSTABLE PIPE ROLL STAND	MSS TYPE 39 PROTECTION SADDLE	MSS TYPE 40 INSULATION PROTECTION SHIELD	THERMAL-HANGER SHIELD	
UNINSULATED SINGLE PIPE										
UP TO 2 INCH	X	X								
2-1/2 INCH TO 4 INCH	X	X								
6 INCH TO 8 INCH	X									
10 INCH	X									
12 INCH			X							
14 INCH AND LARGER			X							
INSULATED SINGLE COLD PIPES										
UP TO 2 INCH	X	X						X	X	A
2-1/2 INCH TO 4 INCH	X								X	
6 INCH TO 8 INCH	X								X	
10 INCH	X								X	
12 INCH	X								X	
14 INCH AND LARGER	X								X	
INSULATED SINGLE HOT PIPES										
UP TO 2 INCH	X	X					X	X	X	A, C
2-1/2 INCH TO 4 INCH			X	X	X	X	X		X	B, C
6 INCH TO 8 INCH			X	X	X	X	X		X	B, C
10 INCH			X	X	X	X	X		X	B, C
12 INCH			X		X	X	X		X	B, C
14 INCH AND LARGER			X				X		X	B, C

GENERAL NOTES:
1. "X" INDICATES APPROVED HANGER OR SUPPORT ELEMENTS. IF MORE THAN ONE HANGER OR SUPPORT ELEMENT IS INDICATED, SELECTION FROM APPROVED ELEMENTS IS CONTRACTOR'S OPTION.
2. REFER TO HANGER AND SUPPORT SECTION FOR APPROVED MANUFACTURERS.
3. HANGERS AND SUPPORTS USED FOR FIRE PROTECTION SERVICES SHALL BE UL LISTED OR FMG APPROVED.
4. HANGER ELEMENTS IN CONTACT WITH BARE COPPER PIPE SHALL BE COPPER PLATED, PLASTIC COATED, FELT LINED, OR USE MANUFACTURED COPPER TUBE ISOLATORS.
5. REFER TO INDIVIDUAL PIPING SPECIFICATION SECTIONS FOR HANGER SPACING.
6. MULTIPLE PARALLEL COLD PIPES MAY BE TRAPEZE SUPPORTED FROM BELOW USING U-BOLTS OR STRUT CLAMPS AND THERMAL HANGER SHIELDS. REFER TO KEYED NOTE A.
7. MULTIPLE PARALLEL COLD PIPES MAY BE TRAPEZE SUPPORTED FROM ABOVE USING STANDARD HANGER ELEMENTS INDICATED FOR SINGLE COLD PIPES.
8. MULTIPLE PARALLEL HOT PIPES MAY BE TRAPEZE SUPPORTED FROM BELOW USING ROLLER ELEMENTS AND THERMAL HANGER SHIELD OR INSULATION PROTECTION SADDLE. REFER TO KEYED NOTES B AND C.
9. MULTIPLE PARALLEL HOT PIPES MAY BE TRAPEZE SUPPORTED FROM ABOVE USING STANDARD ROLLER HANGERS INDICATED AND THERMAL HANGER SHIELD OR INSULATION PROTECTION SADDLE. REFER TO KEY NOTES B AND C.
10. REFER TO INDIVIDUAL PIPING SPECIFICATION SECTIONS FOR ADDITIONAL SYSTEM SPECIFIC HANGER APPLICATIONS.

KEYED NOTES

A. USE THERMAL HANGER SHIELD ON TRAPEZE SUPPORTED INSULATED PIPE TO PREVENT CRUSHING OF INSULATION.
B. USE THERMAL HANGER SHIELD DESIGNED FOR USE ON ROLLER SUPPORTS FOR INSULATED HOT PIPE .
C. USE TYPE 39 PROTECTION SADDLES IF INSULATION WITHOUT VAPOR BARRIER IS INDICATED. FILL INTERIOR VOIDS WITH INSULATION MATCHING ADJOINING INSULATION.

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PBA Project No.: 2019-0237

PROJECT TITLE

New High Point School
Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M7.6-BP3

AIR TERMINAL TYPE

DUCT CONNECTIONS		DISCHARGE SOUND POWER/RADIATED SOUND POWER – dB							
INLET SIZE INCHES	OUTLET SIZE INCHES	125 Hz	250 Hz	500 Hz	1000 Hz	2000 HZ	4000 HZ	MODEL NUMBER	KEYED NOTES
6ø	12x8	73/66	69/63	62/52	56/42	53/40	49/36	DESV	1
8ø	12x10	72/68	70/59	66/53	63/47	57/46	53/46	DESV	2
10ø	14x12-1/2	78/71	70/61	65/56	61/50	58/47	53/45	DESV	3
12ø	16x15	76/72	73/63	69/59	65/53	61/48	57/46	DESV	4
16ø	24x18	78/70	73/63	70/58	68/53	64/52	59/50	DESV	5
24x16	38x18	83/74	81/69	76/63	74/54	73/48	68/41	DESV	6

GENERAL NOTES:
1. MODEL NUMBERS ARE TITUS UNLESS OTHERWISE NOTED.
2. MAXIMUM SOUND POWER LEVEL BASED ON 2" PRESSURE DROP ACROSS UNIT WITH NO ALLOWANCE FOR EXTERNAL ATTENUATION.

KEYED NOTES:
1. BASED ON 350 CFM
2. BASED ON 650 CFM
3. BASED ON 900 CFM
4. BASED ON 1500 CFM
5. BASED ON 2500 CFM
6. BASED ON 5300 CFM

AIR TERMINAL UNIT WITH HOT WATER COIL SCHEDULE - PART A

UNIT IDENTIFICATION	INLET SIZE	AREA SERVED	UNIT SERVED FROM	AIR FLOW					HEATING COIL (NOTE 3)										KEYED NOTES
											AIR		WATER						
				COOLING MAX	COOLING MIN.	HEATING MIN.	HEATING MAX	MAXIMUM A.P.D. W/COIL	CAPACITY MBH	NUMBER ROWS	E.D.B °F	L.D.B. °F	FLOW GPM	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D. FT. HEAD	CONTROL VALVE W.P.D. FT. HEAD	CONTROL VALVE TYPE	
TU-A100	6ø	A100a, A100c	RTU-7	190	140	140	190	0.06	6.9	2	55	88.4	0.6	150	126.6	0.08	11.5	2-WAY	
TU-A101	10ø	A101, A101a,	RTU-7	780	335	335	780	0.2	21.2	2	55	80	1.4	150	120	0.22	11.5	3-WAY	
TU-A102	8ø	A102	RTU-7	415	150	150	415	0.13	13.5	2	55	85	1	150	122.8	0.23	11.5	2-WAY	
TU-A103	6ø	A103	RTU-7	275	80	80	275	0.11	9	2	55	85	0.8	150	126.3	0.12	11.5	2-WAY	
TU-A104	6ø	A104	RTU-7	275	80	80	275	0.11	9	2	55	85	0.8	150	126.3	0.12	11.5	2-WAY	
TU-A105	6ø	A105	RTU-7	230	80	80	275	0.11	9	2	55	85	0.8	150	126.3	0.12	11.5	2-WAY	
TU-A106	6ø	A106	RTU-7	230	80	80	275	0.11	9	2	55	85	0.8	150	126.3	0.12	11.5	2-WAY	
TU-A107	6ø	A107	RTU-7	230	80	80	275	0.11	9	2	55	85	0.8	150	126.3	0.12	11.5	2-WAY	
TU-A108	10ø	A108	RTU-7	840	230	230	840	0.25	22.8	2	55	80	1.4	150	116.3	0.21	11.5	2-WAY	
TU-A109	8ø	A109	RTU-7	540	150	150	540	0.2	14.7	2	55	80	1	150	119.6	0.23	11.5	2-WAY	
TU-A110	10ø	A110	RTU-7	760	300	300	760	0.19	20.6	2	55	80	1.4	150	119.7	0.21	11.5	2-WAY	
TU-A111	6ø	A111	RTU-7	245	80	80	245	0.09	8.6	2	55	87.2	0.8	150	127.3	0.12	11.5	2-WAY	
TU-A112	6ø	A112	RTU-7	205	80	80	245	0.09	8.6	2	55	87.2	0.8	150	127.3	0.12	11.5	2-WAY	
TU-A113	6ø	A113	RTU-7	205	80	80	245	0.09	8.6	2	55	87.2	0.8	150	127.3	0.12	11.5	2-WAY	
TU-A114	6ø	A114	RTU-7	205	80	80	245	0.09	8.6	2	55	87.2	0.8	150	127.3	0.12	11.5	2-WAY	
TU-A115	6ø	A115	RTU-7	205	80	80	245	0.09	8.6	2	55	87.2	0.8	150	127.3	0.12	11.5	2-WAY	
TU-A116	6ø	A116	RTU-7	270	80	80	270	0.1	8.9	2	55	85.4	0.8	150	126.4	0.12	11.5	3-WAY	
TU-A117	8ø	A117	RTU-7	430	150	150	430	0.14	12	2	55	80.8	0.8	150	118.1	0.16	11.5	2-WAY	
TU-A122	6ø	A122	RTU-7	220	80	80	220	0.04	6	1	55	80	0.8	150	134	0.27	11.5	2-WAY	
TU-C101	8ø	C101	RTU-7	340	120	120	340	0.15	9.7	2	55	81.2	0.8	150	124.4	0.12	11.5	2-WAY	
TU-C102	6ø	C102,	RTU-7	250	80	80	250	0.09	8.6	2	55	86.8	0.8	150	127.1	0.12	11.5	2-WAY	
TU-C103	6ø	C103	RTU-7	190	80	80	190	0.03	5.2	1	55	80	0.9	150	137.7	0.33	11.5	2-WAY	
TU-C104	8ø	C104	RTU-7	600	145	145	600	0.23	16.3	2	55	80	1.2	150	121.2	0.27	11.5	2-WAY	
TU-C105	6ø	C105	RTU-7	80	80	80	80	0.01	2.9	1	55	88.3	0.5	150	134.7	0.12	11.5	2-WAY	
TU-B101A	16ø	B101	RTU-6	2700	720	720	2700	0.4	73.2	2	55	80	4.7	150	117.9	0.37	11.5	2-WAY	
TU-B101B	16ø	101	RTU-6	2490	580	580	2490	0.35	67.5	2	55	80	4	150	115.6	0.3	11.5	2-WAY	
TU-B101C	16ø	301	RTU-6	2490	580	580	2490	0.35	67.3	2	55	80	4	150	115.5	0.29	11.5	2-WAY	
TU-B103	10ø	B103	RTU-6	680	555	555	680	0.16	18.4	2	55	80	1.2	150	118.5	0.17	11.5	2-WAY	
TU-B107B	6ø	B107	RTU-6	160	80	80	160	0.02	4.7	1	55	82	0.8	150	137.6	0.27	11.5	2-WAY	
TU-C100	10ø	C100	RTU-4	650	200	200	650	0.17	24.7	2	55	90	2	150	125.1	0.3	11.5	2-WAY	
TU-C106	12ø	C106	RTU-4	1320	830	830	1320	0.31	43	2	55	85	3.2	150	122.8	0.79	11.5	2-WAY	
TU-C107	12ø	C107	RTU-4	1410	825	825	1410	0.35	42	2	55	82.4	2.7	150	118.7	0.59	11.5	2-WAY	
TU-C108	12ø	C108	RTU-4	1320	720	720	1320	0.31	40	2	55	82.9	2.5	150	117.6	0.5	11.5	2-WAY	
TU-C110	12ø	C110	RTU-4	1200	720	720	1200	0.27	39.1	2	55	85	2.6	150	119.5	0.54	11.5	3-WAY	
TU-C111	12ø	C111	RTU-4	1170	720	720	1170	0.26	38.1	2	55	85	2.5	150	118.6	0.49	11.5	3-WAY	
TU-C113	12ø	C113	RTU-4	1230	720	720	1230	0.28	40	2	55	85	2.7	150	120.3	0.59	11.5	2-WAY	
TU-C114	12ø	C114	RTU-4	1110	670	670	1110	0.24	36.1	2	55	85	2.2	150	117	0.39	11.5	2-WAY	
TU-C115	6ø	C115	RTU-4	225	120	120	225	0.08	8.3	2	55	88.9	0.8	150	128.1	0.12	11.5	2-WAY	
TU-C117	12ø	C117	RTU-4	1050	830	830	1050	0.22	34.2	2	55	85	2	150	115.3	0.37	11.5	2-WAY	
TU-D100	8ø	D100	RTU-8	550	400	400	550	0.24	20.9	2	55	90	2.3	150	131.2	0.73	11.5	3-WAY	
TU-D106	12ø	D106	RTU-8	1260	790	790	1260	0.29	41	2	55	85	2.9	150	121.1	0.65	11.5	2-WAY	
TU-D107	12ø	D107	RTU-8	1260	790	790	1260	0.29	41	2	55	85	2.9	150	121.1	0.65	11.5	2-WAY	
TU-D108	12ø	D108	RTU-8	1320	790	790	1320	0.43	50.1	3	55	90	2.9	150	115.3	0.45	11.5	3-WAY	
TU-D109	12ø	D109	RTU-8	1380	790	790	1380	0.34	44.9	2	55	85	3.6	150	124.4	0.97	11.5	3-WAY	
TU-D110	12ø	D110	RTU-8	1170	790	790	1170	0.26	38.1	2	55	85	2.5	150	118.6	0.49	11.5	2-WAY	
TU-D111	12ø	D111	RTU-8	1170	790	790	1170	0.26	38.1	2	55	85	2.5	150	118.6	0.49	11.5	2-WAY	
TU-D117	6ø	D117	RTU-8	130	80	80	130	0.01	4.8	1	55	88.7	0.8	150	137.4	0.27	11.5	3-WAY	
TU-102	24X16	102	RTU-9	3030	1400	1400	3030	0.23	98.6	2	55	85	5.3	150	112.4	0.64	11.5	2-WAY	
TU-E102	6ø	CORR 102	RTU-9	250	80	80	250	0.09	8.6	2	55	86.8	0.8	150	127.1	0.12	11.5	2-WAY	
TU-E103B	8ø	E103B	RTU-9	500	145	145	500	0.17	13.6	2	55	80.0	0.9	150	118.7	0.2	11.5	2-WAY	
TU-E103G	6ø	E103G	RTU-9	170	170	170	170	0.03	4.6	1	55	80	0.6	150	134.3	0.2	11.5	2-WAY	
TU-E107	8ø	E107	RTU-9	575	320	320	575	0.25	21.8	2	55	90	2.6	150	132.6	0.93	11.5	3-WAY	
TU-E108	6ø	E108	RTU-9	110	80	80	110	0.01	3.3	1	55	83	0.5	150	132.3	0.12	11.5	3-WAY	
TU-E113	6ø	E113	RTU-9	80	80	80	80	0.01	2.9	1	55	88.3	0.5	150	134.7	0.12	11.5	2-WAY	
TU-E114	6ø	E114	RTU-9	80	80	80	80	0.01	2.9	1	55	88.3	0.5	150	134.7	0.12	11.5	2-WAY	
TU-E115	6ø	E115	RTU-9	80	80	80	80	0.01	2.9	1	55	88.3	0.5	150	134.7	0.12	11.5	2-WAY	

GENERAL NOTES:
1. MODEL NUMBERS ARE TITUS UNLESS OTHERWISE NOTED.
2. MAXIMUM PRESSURE DROP SCHEDULED SHALL BE THE MAXIMUM ALLOWABLE STATIC PRESSURE FOR BOX AND COIL. AT THE MAXIMUM CFM.
3. HEATING COIL SELECTION BASED ON HEATING MAXIMUM AIR FLOW.

THIS EQUIPMENT SHALL BE PROVIDED AS A FACTORY ASSEMBLED SNOWMELT PACKAGE. REFER TO SPECIFICATIONS AND DETAILS.

SNOWMELT PACKAGE CONNECTION SCHEDULE

40% PROPYLENE GLYCOL INLET IN.	40% PROPYLENE GLYCOL OUTLET IN.	BOILER WATER LOOP INLET IN.	BOILER WATER LOOP OUTLET IN.	VOLTAGE
2 1/2	2 1/2	2 1/2	2 1/2	480

NOTE:
1. PACKAGE TO INCLUDE WESSELS GM-18 GLYCOL MAKE-UP PACKAGE.
2. ENTIRE PACKAGE TO BE PRE-PIPED AND WIRED.
3. PACKAGE TO INCLUDE WIRED CONTROL PANEL POWER.
4. SKID PACKAGE SHALL NOT BE LARGER THAN 3'-0"D x 6'-0"L x 6'-0"H.

SNOWMELT SYSTEM ZONING SCHEDULE

MANIFOLD	AREA SERVED (SQFT)	NUMBER OF CIRCUITS	CAPACITY (MBH)	WATERFLOW (GPM)	WATER TEMP.		TUBING				REMARKS
					E.W.T. °F	AVERAGE °F	TUBE DIAMETER INCHES	TUBE SPACING INCHES	MAX. CIRCUIT LENGTH FT.	TUBING HEAD LOSS (FT HD/10FT)	
ZONE 1	1,945	9	322.1	23.7	120.0	90.0	3/4	9	300	0.44	
ZONE 2	2,770	12	448.5	33.0	120.0	90.0	3/4	9	300	0.44	
ZONE 3	685	3	112.8	8.3	120.0	90.0	3/4	9	300	0.44	

NOTE:
1. MODEL NUMBERS ARE WATTS RADIANT UNLESS OTHERWISE NOTED.
2. BTUH CAPACITIES ARE BASED ON 40% PROPYLENE GLYCOL.
3. HEATING CAPACITIES BASED ON 6" CONCRETE SLAB.
4. TUBING SHALL HAVE FACTORY MANUFACTURED OXYGEN BARRIER AND MEET ASTM F876 STANDARDS.
5. PROVIDE COMPLETE BRASS MANIFOLD ASSEMBLY WITH BLEEDER AND FILL CONNECTIONS, FULL PORT BALL VALVES ON THE RETURN INLETS AND CIRCUIT BALANCING VALVES ON THE SUPPLY DISTRIBUTION CIRCUIT SIDE BY THE SAME MANUFACTURER.
6. SUBMIT PIPING LAYOUT SUBMITTAL PRIOR TO INSTALLATION.

EXPANSION TANK SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	ESTIMATED TOTAL SYSTEM VOLUME GALLON	TYPE	OPERATING PRESSURE		OPERATING TEMPERATURE		TANK VOLUME GALLON	ACCEPTANCE VOLUME GALLON	DIMENSIONS		MODEL NUMBER	REMARKS
				MINIMUM PSIG	MAXIMUM PSIG	MINIMUM °F	MAXIMUM °F			DIAMETER INCHES	HEIGHT INCHES		
ET-2	SNOWMELT	400	DIAPHRAGM	12	30	120.0	90.0	21.7	11.3	16.25	29.5	D-40V	40% PROPYLENE GLYCOL

NOTE:
1. MODEL NUMBERS ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.

WATER TO WATER HEAT EXCHANGER SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	CAPACITY MBH	PRIMARY WATER					SECONDARY WATER – 40% PG				MODEL NUMBER	REMARKS
				FLOW GPM	E.W.T.	L.W.T.	MAXIMUM W.P.D. FT. HEAD	CONTROL VALVE W.P.D. FT. HEAD	FLOW GPM	E.W.T.	L.W.T.	MAXIMUM W.P.D. FT. HEAD		
HX-1	SNOWMELT	BRAZED PLATE	892	61.0	150.0	120.0	8.6	11.55	65.0	90.0	120.0	10.4	BP422-60	

NOTE:
1. MODEL NUMBERS ARE BELL AND GOSSETT UNLESS OTHERWISE NOTED.
2. PRIMARY SIDE IS WATER. SECONDARY SIDE IS 40% PROPYLENE GLYCOL.

PUMP SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	LOCATION	TYPE	COUPLING TYPE	WATERFLOW GPM	PUMP HEAD FT.	MINIMUM EFFICIENCY %	MOTOR			MODULATION/ CONTROL TYPE	ELECTRICAL			MODEL NUMBER	REMARKS
								BHP	HP	RPM		VOLTS	PHASE	OPTIONS/ ACCESSORIES		
CP-7	SNOWMELT	B106	CENTRIFUGAL	CLOSE	65.0	70	63.2	2.0	3.0	3600	AUTO	480	3	---	1.25AAB	NOTE 3
CP-8	SNOWMELT	B106	CENTRIFUGAL	CLOSE	65.0	70	63.2	2.0	3.0	3600	AUTO	480	3	---	1.25AAB	NOTE 3

NOTE:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBER ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
3. PUMP PERFORMANCE BASED ON 40% PROPYLENE GLYCOL.

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M7.7-BP3

AIR TERMINAL UNIT WITH HOT WATER COIL SCHEDULE - PART B

UNIT IDENTIFICATION	INLET SIZE	AREA SERVED	UNIT SERVED FROM	AIR FLOW					HEATING COIL (NOTE 3)									KEYED NOTES
											AIR		WATER					
				COOLING MAX	COOLING MIN.	HEATING MIN.	HEATING MAX	MAXIMUM A.P.D. W/COIL	CAPACITY MBH	NUMBER ROWS	E.D.B °F	L.D.B. °F	FLOW GPM	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D. FT. HEAD	CONTROL VALVE W.P.D. FT. HEAD	CONTROL VALVE TYPE	
TU-E117	6ø	E117	RTU-9	270	85	85	270	0.1	8.9	2	55	85.4	0.8	150	126.4	0.12	11.5	2-WAY	
TU-E117B	6ø	E117B	RTU-9	80	80	80	80	0.01	2.9	1	55	88.3	0.5	150	134.7	0.12	11.5	2-WAY	
TU-303B	16ø	305	RTU-9	2255	580	580	2255	0.3	61.2	2	55	80	3.5	150	114.2	0.24	11.5	2-WAY	
TU-E118	12ø	E108	RTU-9	1060	485	485	1060	0.19	28.8	2	55	80	1.6	150	113.8	0.29	11.5	2-WAY	
TU-E119	10ø	E119	RTU-9	700	600	600	700	0.16	19	2	55	80	1.2	150	118.8	0.18	11.5	2-WAY	
TU-F102A	8ø	F113	RTU-9	635	145	145	635	0.26	17.2	2	55	80	1.2	150	121.7	0.29	11.5	2-WAY	
TU-F102B	6ø	F115	RTU-9	175	80	80	175	0.03	4.8	1	55	80	0.7	150	135.1	0.21	11.5	2-WAY	
TU-G102A	8ø	G102	RTU-9	635	145	145	635	0.26	17.2	2	55	80	1.2	150	121.7	0.29	11.5	2-WAY	
TU-G102B	6ø	G118	RTU-9	165	80	80	165	0.02	4.5	1	55	80	0.6	150	133.9	0.19	11.5	2-WAY	
TU-K102	8ø	K102	RTU-9	630	145	145	630	0.25	17.1	2	55	80	1.2	150	121.6	0.29	11.5	2-WAY	
TU-303A	12ø	303	RTU-9	1500	325	325	1500	0.38	40.7	2	55	80	2.3	150	114.6	0.44	11.5	2-WAY	
TU-K116	8ø	K116	RTU-9	450	145	145	450	0.15	14.7	2	55	85	1.1	150	124	0.27	11.5	2-WAY	
TU-F100	8ø	F100	RTU-3	600	200	200	600	0.27	22.8	2	55	90	2.9	150	134.1	1.19	11.5	2-WAY	
TU-F103	12ø	F103	RTU-3	1315	665	665	1315	0.31	42.8	2	55	85	3.2	150	122.6	0.78	11.5	2-WAY	
TU-F104	16ø	F104	RTU-3	1405	660	660	1405	0.35	45.7	2	55	85	3.7	150	125.1	1.05	11.5	2-WAY	
TU-F105	16ø	F105	RTU-3	1405	550	550	1405	0.35	45.7	2	55	85	3.7	150	125.1	1.05	11.5	2-WAY	
TU-F106	12ø	F106	RTU-3	1270	660	660	1270	0.29	41.3	2	55	85	2.9	150	121.4	0.67	11.5	3-WAY	
TU-F107	12ø	F107	RTU-3	1160	550	550	1160	0.26	37.8	2	55	85	2.4	150	118.4	0.47	11.5	3-WAY	
TU-F108	6ø	F108	RTU-3	190	80	80	190	0.03	5.2	1	55	80	0.9	150	137.7	0.33	11.5	3-WAY	
TU-F109	12ø	F109	RTU-3	1220	550	550	1220	0.28	39.7	2	55	85	2.7	150	120	0.57	11.5	2-WAY	
TU-F110	12ø	F110	RTU-3	1265	590	590	1265	0.29	41.2	2	55	85	2.9	150	121.3	0.66	11.5	2-WAY	
TU-F112	12ø	F112	RTU-3	1150	550	550	1150	0.25	37.4	2	55	85	2.4	150	118.1	0.46	11.5	2-WAY	
TU-G100	8ø	G100	RTU-2	580	200	200	580	0.26	22	2	55	90	2.6	150	132.9	0.98	11.5	2-WAY	
TU-G103	12ø	G103	RTU-2	1315	665	665	1315	0.31	42.8	2	55	85	3.2	150	122.6	0.78	11.5	2-WAY	
TU-G104	12ø	G104	RTU-2	1405	660	660	1405	0.35	45.7	2	55	85	3.7	150	125.1	1.05	11.5	2-WAY	
TU-G105	12ø	G105	RTU-2	1295	530	530	1295	0.3	42.2	2	55	85	3.1	150	122.1	0.73	11.5	2-WAY	
TU-G108	12ø	G108	RTU-2	1205	520	520	1205	0.27	39.2	2	55	85	2.6	150	119.6	0.55	11.5	3-WAY	
TU-G109	12ø	G109	RTU-2	1205	520	520	1205	0.27	39.2	2	55	85	2.6	150	119.6	0.55	11.5	3-WAY	
TU-G112	12ø	G112	RTU-2	1215	530	530	1215	0.27	39.6	2	55	85	2.7	150	119.9	0.56	11.5	2-WAY	
TU-G113	12ø	G113	RTU-2	1320	520	520	1320	0.31	43	2	55	85	3.2	150	122.8	0.79	11.5	2-WAY	
TU-G114	12ø	G114	RTU-2	1290	665	665	1290	0.3	42	2	55	85	3.1	150	122	0.72	11.5	2-WAY	
TU-H102A	16ø	H102	RTU-11	2425	580	580	2425	0.34	65.8	2	55	80	3.8	150	114.9	0.28	11.5	2-WAY	
TU-H102B	16ø	H102	RTU-11	1980	580	580	1980	0.24	53.7	2	55	80	2.9	150	112.5	0.18	11.5	2-WAY	
TU-H102C	16ø	H102	RTU-11	2135	580	580	2135	0.28	57.9	2	55	80	3.2	150	113.4	0.22	11.5	2-WAY	
TU-H102D	16ø	H102	RTU-11	2465	580	580	2465	0.35	66.9	2	55	80	3.9	150	115.3	0.29	11.5	3-WAY	
TU-H102E	16ø	H102	RTU-11	1830	580	580	1830	0.19	49.6	2	55	80	3	150	116.4	0.19	11.5	3-WAY	
TU-H102F	16ø	H102B	RTU-11	2370	580	580	2370	0.33	64.3	2	55	80	3.7	150	114.9	0.27	11.5	2-WAY	
TU-H104	8ø	H104	RTU-11	570	570	570	570	0.22	15.5	2	55	80	1.1	150	120.4	0.25	11.5	2-WAY	
TU-J101	16ø	J101	RTU-13	1560	1025	1025	1560	0.17	50.8	2	55	85	3	150	115.8	0.19	11.5	2-WAY	
TU-J105A	12ø	J105	RTU-13	1460	860	860	1460	0.32	39.6	2	55	80	2.9	150	122.2	0.66	11.5	2-WAY	
TU-J105B	12ø	J105	RTU-13	1445	325	325	1445	0.32	39.2	2	55	80	2.8	150	121.8	0.63	11.5	2-WAY	
TU-J105C	6ø	J105A	RTU-13	100	80	80	100	0.01	3.7	1	55	89.3	0.8	150	140.1	0.27	11.5	2-WAY	
TU-J105D	6ø	J105C	RTU-13	280	80	80	280	0.11	9	2	55	84.7	0.8	150	126.1	0.12	11.5	2-WAY	
TU-J105E	6ø	J105E	RTU-13	300	80	80	300	0.12	9.3	2	55	83.4	0.8	150	125.5	0.12	11.5	2-WAY	
TU-J108	12ø	J108	RTU-13	1440	550	550	1440	0.31	39.1	2	55	80	2.8	150	121.7	0.62	11.5	2-WAY	
TU-K100	8ø	K100	RTU-1	580	200	200	580	0.26	22	2	55	90	2.6	150	132.9	0.98	11.5	2-WAY	
TU-K103	12ø	K103	RTU-1	1315	730	730	1315	0.31	42.8	2	55	85	3.2	150	122.6	0.78	11.5	2-WAY	
TU-K104	12ø	K104	RTU-1	1405	725	725	1405	0.35	45.7	2	55	85	3.7	150	125.1	1.05	11.5	2-WAY	
TU-K105	12ø	K105	RTU-1	1300	600	600	1300	0.31	42.3	2	55	85	3.1	150	122.2	0.74	11.5	2-WAY	
TU-K108	12ø	K108	RTU-1	1205	590	590	1205	0.27	39.2	2	55	85	2.6	150	119.6	0.55	11.5	3-WAY	
TU-K109	12ø	K109	RTU-1	1210	620	620	1210	0.27	39.4	2	55	85	2.7	150	119.8	0.55	11.5	3-WAY	
TU-K111	12ø	K111	RTU-1	1320	725	725	1320	0.31	43	2	55	85	3.2	150	122.8	0.79	11.5	2-WAY	
TU-K112	12ø	K112	RTU-1	1320	725	725	1320	0.31	43	2	55	85	3.2	150	122.8	0.79	11.5	2-WAY	
TU-K113	12ø	K113	RTU-1	1240	725	725	1240	0.28	40.4	2	55	85	2.8	150	120.6	0.61	11.5	2-WAY	

GENERAL NOTES:
1. MODEL NUMBERS ARE TITUS UNLESS OTHERWISE NOTED.
2. MAXIMUM PRESSURE DROP SCHEDULED SHALL BE THE MAXIMUM ALLOWABLE STATIC PRESSURE FOR BOX AND COIL. AT THE MAXIMUM CFM.
3. HEATING COIL SELECTION BASED ON HEATING MAXIMUM AIR FLOW.

AIR-COOLED CONDENSING UNIT SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TOTAL CAPACITY MBH	MINIMUM EER	REFRIGERATION TYPE	NUMBER OF CIRCUITS	NUMBER OF CONTROL STAGES	CONDENSER		CONDENSER FAN	COMPRESSOR		MODULATION/ CONTROL TYPE	ELECTRICAL					MODEL NUMBER	KEYED NOTES
							DESIGN AMBIENT TEMPERATURE °F	MINIMUM AMBIENT TEMPERATURE °F	QUANTITY	NUMBER OF COMPRESSORS	TYPE OF COMPRESSOR		VOLTS	PHASE	FLA	MOP	OPTIONS/ ACCESSORIES		
ACCU-1	ACU-1	18.0	12.5	R-410A	1	1	95.0	0.0	1	1	RECIP	AUTO	208	1	18.3	20	B	RK18NMVJU	DAIKIN, NOTE 5
ACCU-2	ACU-2	9.0	12.5	R-410A	1	1	95.0	0.0	1	1	RECIP	AUTO	208	1	12.1	15	B	RK09NMVJU	DAIKIN, NOTE 5
ACCU-3	ACU-3	9.0	12.5	R-410A	1	1	95.0	0.0	1	1	RECIP	AUTO	208	1	12.1	15	B	RK09NMVJU	DAIKIN, NOTE 5
ACCU-4	ACU-4	9.0	12.5	R-410A	1	1	95.0	0.0	1	1	RECIP	AUTO	208	1	12.1	15	B	RK09NMVJU	DAIKIN, NOTE 5
ACCU-5	ACU-5	9.0	12.5	R-410A	1	1	95.0	0.0	1	1	RECIP	AUTO	208	1	12.1	15	B	RK09NMVJU	DAIKIN, NOTE 5
ACCU-6	ACU-6	9.0	12.5	R-410A	1	1	95.0	0.0	1	1	RECIP	AUTO	208	1	12.1	15	B	RK09NMVJU	DAIKIN, NOTE 5

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE DAIKIN UNLESS OTHERWISE NOTED.
3. REFER TO AIR HANDLING UNIT DIRECT EXPANSION COOLING COIL SCHEDULE FOR ASSOCIATED COOLING COIL.
4. EFFICIENCY RATING SHALL BE IN ACCORDANCE WITH ARI-STANDARD 340/360-2004.
5. PROVIDE UNIT WITH LOW AMBIENT CONTROL.
6. PROVIDE ROOF PENETRATION CURBS AT REFRIGERANT PIPING.

VIBRATION ISOLATOR APPLICATION SCHEDULE

EQUIPMENT TYPE	EQUIPMENT CATEGORY	HORSEPOWER AND OTHER	RPM	EQUIPMENT LOCATION						KEYED NOTES
				SLAB ON GRADE			UP TO 40 FT (12 M) FLOOR SPAN			
				BASE TYPE	ISOLATOR TYPE	MIN. DEFL., IN. (MM)	BASE TYPE	ISOLATOR TYPE	MIN. DEFL., IN. (MM)	
PUMPS	CLOSE COUPLED	≤7.5 ≥10	ALL ALL	B C	2 3	0.25 (6) 0.75 (19)	C C	3 3	0.75 (19) 1.50 (38)	NOTE 3
	INLINE	5 TO 25 ≥30	ALL ALL	A A	3 3	0.75 (19) 1.50 (38)	A A	3, 8a OR 8b 3, 8a OR 8b	1.50 (38) 2.50 (64)	
	END SUCTION AND DOUBLE SUCTION/SPLIT CASE	≤40 50 TO 125 ≥150	ALL ALL ALL	C C C	3 3 3	0.75 (19) 0.75 (19) 0.75 (19)	C C C	3 3 3	1.50 (38) 2.50 (64) 3.50 (89)	
	PACKAGED PUMP SYSTEMS	ALL	ALL	A	3	0.75 (19)	C	3	2.50 (64)	
BOILERS	FIRE-TUBE WATER-TUBE, COPPER FIN	ALL ALL	ALL ALL	A A	1a OR 1b 1a OR 1b	0.25 (6) 0.12 (3)	B B	4 4	2.50 (64) 0.25 (6)	NOTE 3
SUSPENDED AXIAL FANS, PLENUM FANS, CABINET FANS, FAN SECTIONS, CENTRIFUGAL INLINE FANS	UP TO 22 IN. DIAMETER	ALL	ALL				A OR B	8a OR 8b	0.75 (19)	NOTES 1, 3, 4
	24 IN. DIAMETER AND UP	≤2 IN. SP	UP TO 300 301 TO 500 500 AND UP				A OR B A OR B A OR B	8a OR 8b 8a OR 8b 8a OR 8b	1.50 (38) 1.50 (38) 1.50 (38)	
		>2 IN. SP	UP TO 300 301 TO 500 500 AND UP				A OR B A OR B A OR B	8a OR 8b 8a OR 8b 8a OR 8b	3.50 (89) 2.50 (64) 2.50 (64)	
CENTRIFUGAL FANS	UP TO 22 IN. DIAMETER	ALL	ALL	B	2	0.25 (6)	B	3	1.50 (38)	NOTES 1, 3, 4
	24 IN. DIAMETER AND UP	≤40	UP TO 300 301 TO 500 500 AND UP	B B B	3 3 3	2.50 (64) 1.50 (38) 0.75 (19)	B B B	3 3 3	3.50 (89) 2.50 (64) 1.50 (38)	
		≥50	UP TO 300 301 TO 500 500 AND UP	C C C	3 3 3	2.50 (64) 1.50 (38) 1.00 (25)	C C C	3 3 3	3.50 (89) 2.50 (64) 2.50 (64)	
PACKAGED AND MODULAR AIR HANDLING, AIR CONDITIONING, AND HEATING AND VENTILATING UNITS	ALL	≤10	ALL	A	3	0.75 (19)	A	3	0.75 (19)	NOTES 1, 3, 4
	ALL	≤15 AND ≤4 IN. SP	UP TO 300 301 TO 500 500 AND UP	A A A	3 3 3	0.75 (19) 0.75 (19) 0.75 (19)	C A A	3 3 3	3.50 (89) 2.50 (64) 1.50 (38)	
		≥15 AND/OR >4 IN. SP	UP TO 300 301 TO 500 500 AND UP	B B B	3 3 3	0.75 (19) 0.75 (19) 0.75 (19)	C C C	3 3 3	3.50 (89) 2.50 (64) 2.50 (64)	
PACKAGED AND MODULAR AIR HANDLING, AIR CONDITIONING AND HEATING AND VENTILATING UNITS WITH INTERNAL SPRING ISOLATORS	ALL	ALL	ALL	A	1a	0.25 (6)	A	1a	0.25 (6)	NOTES 1, 3, 4
AIR HANDLING EQUIPMENT WITH NON-INTERNALLY ISOLATED FAN ARRAYS (AIR HANDLING UNITS, CABINET FANS, FAN UNITS, ETC.)	ALL	ALL	ALL	A	3	0.75 (19)	A	3	2.50 (64)	NOTES 1, 3, 4
PACKAGED ROOFTOP EQUIPMENT	ALL	≥10 TONS REFRIG. OR ≥10 HP FAN	ALL				D OR E	3	1.50 (38)	NOTES 1, 3, 4, 5

GENERAL NOTES:

KEYED NOTES:
1. THRUST RESTRAINTS: PROVIDE THRUST RESTRAINTS BETWEEN FAN DISCHARGE AND DUCT (IN PAIRS, LOCATED ON THE CENTERLINE OF THE DISCHARGE OUTLET OF THE FAN, BRIDGING THE FLEXIBLE DUCT CONNECTOR) FOR ALL FAN HEADS, FOR AXIAL AND CENTRIFUGAL FANS UNITS OPERATING AT 2 INCHES OR GREATER TOTAL STATIC PRESSURE AND AS SHOWN ON DRAWINGS. SPRING DEFLECTION SHALL BE SAME AS THE SUPPORT ISOLATORS.
2. PIPING RISER ISOLATION: PROVIDE PIPE RISER RESILIENT ANCHORS, SPRING MOUNTS AND RESILIENT PIPE GUIDES CAPABLE OF DISTRIBUTING THE LOADS WITHIN THE BUILDING DESIGN LIMITS AT THE SUPPORT POINTS.
3. HORIZONTAL PIPING VIBRATION ISOLATION: PROVIDE TYPE 8a OR 8b SPRING HANGERS FOR PIPING CONNECTED TO VIBRATION ISOLATED EQUIPMENT FOR ALL PIPING IN MECHANICAL ROOMS OR THE FOLLOWING MINIMUM HORIZONTAL DISTANCES FROM THE ISOLATED EQUIPMENT: UP TO 6" – 50 FEET (1 1/2" MINIMUM DEFLECTION), 8" AND LARGER – 100 FEET (2 1/2" MINIMUM DEFLECTION), WHICHEVER IS GREATER, AND AS SHOWN ON DRAWINGS. THE FIRST 4 HANGERS FROM THE ISOLATED EQUIPMENT SHALL BE TYPE 8b.
4. DUCTWORK VIBRATION ISOLATION: PROVIDE TYPE 8a OR 8b SPRING HANGERS FOR DUCTWORK WITH A CROSS SECTION OF 2 SQUARE FEET OR GREATER CONNECTED TO AIR HANDLING UNITS, RETURN OR RELIEF FANS, AND VIBRATION ISOLATED EQUIPMENT FOR ALL SUCH DUCTWORK IN MECHANICAL ROOMS OR FOR A MINIMUM HORIZONTAL DISTANCE OF 100 FEET FROM THE ISOLATED EQUIPMENT, WHICHEVER IS GREATER, AND AS SHOWN ON DRAWINGS (3/4" MINIMUM DEFLECTION).
5. IF SPAN DOES NOT EXCEED 20 FT, SPRING DEFLECTION MAY BE 1.0 IN AND TYPE D BASE MAY BE USED. FOR SPANS GREATER THAN 20 FT, USE SPRING DEFLECTION INDICATED AND TYPE E BASE.

BASE TYPES:

BASE TYPE A – NO BASE, ISOLATORS ATTACHED DIRECTLY TO EQUIPMENT.
BASE TYPE B – STRUCTURAL, STEEL RAILS OR BASE.
BASE TYPE C – CONCRETE INERTIA BASE.
BASE TYPE D – CURB – MOUNTED ALUMINUM BASE WITH 1" DEFL. SPRING ISOLATORS
BASE TYPE E – CURB – MOUNTED STEEL BASE WITH ADJUSTABLE 1", 2" OR 3" DEFL. SPRING ISOLATORS

ISOLATOR TYPES:

ISOLATOR TYPE 1a – ELASTOMERIC ISOLATION PAD.
ISOLATOR TYPE 1b – ELASTOMERIC ISOLATION PAD WITH STEEL LOAD BEARING PLATE.
ISOLATOR TYPE 2 – ELASTOMERIC FLOOR ISOLATOR.
ISOLATOR TYPE 3 – FREE STANDING SPRING FLOOR ISOLATOR.
ISOLATOR TYPE 4 – RESTRAINED SPRING ISOLATOR.
ISOLATOR TYPE 5 – THRUST RESTRAINT.
ISOLATOR TYPE 6 – AIR SPRING.
ISOLATOR TYPE 7 – ELASTOMERIC HANGERS.
ISOLATOR TYPE 8a – SPRING HANGERS.
ISOLATOR TYPE 8b – SPRING HANGERS WITH VERTICAL-LIMIT STOP.

AIR CONDITIONING UNIT SCHEDULE

UNIT TAG	TOTAL CAPACITY MBH	EVAPORATOR FAN		COOLING COIL – DX		HEATING COIL – HOT WATER						REFRIG. TYPE	ELECTRICAL						MODEL NUMBER	REMARKS
		AIRFLOW CFM	HP	E.D.B. °F	E.W.B. °F	TOTAL CAPACITY MBH	E.A.T. °F	L.A.T. °F	E.W.T. °F	L.W.T. °F	FLOW GPM		VOLTS	PHASE	FLA	MCA	MOP	OPTIONS/ ACCESSORIES		
ACU-1	18.0	713	46	80.0	67.0	---	---	---	---	---	---	R-410A	208	1	0.3	---	15	B	FTK18NMVJU	PROVIDE WITH CONDENSATE PUMP
ACU-2	9.0	330	21 W	80.0	67.0	---	---	---	---	---	---	R-410A	208	1	0.2	---	15	B	FTK09NMVJU	PROVIDE WITH CONDENSATE PUMP
ACU-3	9.0	330	21 W	80.0	67.0	---	---	---	---	---	---	R-410A	208	1	0.2	---	15	B	FTK09NMVJU	PROVIDE WITH CONDENSATE PUMP
ACU-4	9.0	330	21 W	80.0	67.0	---	---	---	---	---	---	R-410A	208	1	0.2	---	15	B	FTK09NMVJU	PROVIDE WITH CONDENSATE PUMP
ACU-5	9.0	330	21 W	80.0	67.0	---	---	---	---	---	---	R-410A	208	1	0.2	---	15	B	FTK09NMVJU	PROVIDE WITH CONDENSATE PUMP
ACU-6	9.0	330	21 W	80.0	67.0	---	---	---	---	---	---	R-410A	208	1	0.2	---	15	B	FTK09NMVJU	PROVIDE WITH CONDENSATE PUMP

NOTE:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS DAIKIN UNLESS OTHERWISE NOTED.

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PROJECT TITLE
New High Point School
Washtenaw Intermediate School District
1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE
MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN KRD
CHECKED SVM
APPROVED RNR

PROJECT NO.
19040

DRAWING NO.
M7.8-BP3

TEMPERATURE CONTROL - SYMBOLS LIST

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
AFC	AIR FLOW CONTROLLER
AQ	AQUASTAT, STRAP ON BULB
CO2	CARBON DIOXIDE SENSOR – WALL MOUNTED
CO2	CARBON DIOXIDE SENSOR – DUCT MOUNTED
CO	CARBON MONOXIDE SENSOR – WALL MOUNTED
CO	CARBON MONOXIDE SENSOR – DUCT MOUNTED
CS	CURRENT SWITCH
CT	CURRENT TRANSMITTER
	DAMPER – OPPOSED BLADE
	DAMPER – PARALLEL BLADE
M	DAMPER MOTOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
DPS	DIFFERENTIAL PRESSURE SWITCH
ES OR LS	END SWITCH OR LIMIT SWITCH
CM	FIRE ALARM SYSTEM, ADDRESSABLE CONTROL MODULE
IM	FIRE ALARM SYSTEM, ADDRESSABLE INTERFACE MODULE
FMS	FLOW MEASURING STATION
FM	FLOW METER
FS	FLOW SWITCH
FZ	FREEZESTAT
F	GAUGE – FLOW
P	GAUGE – PRESSURE
T	GAUGE – TEMPERATURE
	GUARD FOR STAT OR SENSOR
	HUMIDIFER
H	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)
H	HUMIDITY SENSOR, DUCT MOUNTED
LVL	LEVEL SWITCH OR TRANSMITTER
LS	LIMIT SWITCH
	LINE – ELECTRIC
	LINE – INSTRUMENT AIR
M/S	MOTOR STARTER
OS	OCCUPANCY SENSOR
R	PILOT LIGHT OR BEACON R – RED LENS A – AMBER LENS B – BLUE LENS G – GREEN LENS
PS	PRESSURE SWITCH
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

SCHEMATIC SYMBOLS (CONT.)

SYMBOL	DESCRIPTION
DD	SMOKE DETECTOR – DUCT MOUNTED
SD	SMOKE DETECTOR – SPACE MOUNTED
S/S	START/STOP RELAY
SPT	STATIC PRESSURE TRANSMITTER
SP	STATIC PRESSURE SENSOR OR PROBE
SW	SWITCH
T	TEMPERATURE SENSOR – RIGID ELEMENT IN WELL
T	TEMPERATURE SENSOR – STRAP ON BULB
T	TEMPERATURE SENSOR – DUCT MOUNTED AVG ELEMENT
T	TEMPERATURE SENSOR – DUCT MOUNTED RIGID ELEMENT
T	THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)
T N	THERMOSTAT FOR NIGHT SETBACK
XF	TRANSFORMER
	VALVE – 2 WAY CONTROL VALVE
	VALVE – 3 WAY CONTROL VALVE
VFC	VARIABLE FREQUENCY CONTROLLER
VS	VELOCITY SENSOR
VIB	VIBRATION SWITCH
V	VOLTAGE SENSOR

WIRING SYMBOLS

SYMBOL	DESCRIPTION
	AUDIBLE DEVICE (AS DEFINED ON TC DRAWINGS)
M/S	COIL – MOTOR STARTER CONTACTOR
R	COIL – RELAY
TDR	COIL – TIME DELAY RELAY
VFC	COIL – VARIABLE FREQUENCY CONTROLLER CONTACTOR
	COIL – EP OR SOLENOID VALVE
	CONTACT – INSTANT OPERATING, NO
	CONTACT – INSTANT OPERATING, NC
	CONTACT – TIMED AFTER COIL IS ENERGIZED, NOTC
	CONTACT – TIMED AFTER COIL IS ENERGIZED, NCTO
	CONTACT – TIMED AFTER COIL IS DE-ENERGIZED, NOTO
	CONTACT – TIMED AFTER COIL IS DE-ENERGIZED, NCTC
	GROUND
	MOTOR, SINGLE PHASE
R	PILOT LIGHT OR BEACON R – RED LENS A – AMBER LENS B – BLUE LENS G – GREEN LENS
R	PILOT LIGHT, WITH PUSH-TO-TEST
	PUSH BUTTON – MOMENTARY CONTACT, NO
	PUSH BUTTON – MOMENTARY CONTACT, NC
	PUSH BUTTON – MOMENTARY CONTACT, NO & NC
	PUSH BUTTON – MOMENTARY, NO (MUSHROOM HEAD)
	PUSH BUTTON – MOMENTARY, NC (MUSHROOM HEAD)

WIRING SYMBOLS (CONT.)

SYMBOL	DESCRIPTION
1 2	SWITCH – 2 POSITION SELECTOR
H O A	SWITCH – 3 POSITION SELECTOR HAND/OFF/AUTO
	SWITCH – FLOW (AIR, WATER, ETC.), NO
	SWITCH – FLOW (AIR, WATER, ETC.), NC
	SWITCH – LIMIT, NO
	SWITCH – LIMIT, NO, HELD CLOSED
	SWITCH – LIMIT, NC
	SWITCH – LIMIT, NC, HELD OPEN
	SWITCH – LIQUID LEVEL, NO
	SWITCH – LIQUID LEVEL, NC
	SWITCH – MANUAL SPST, NO
	SWITCH – MANUAL DPDT, NO
	SWITCH – MANUAL SPST, NC
	SWITCH – MANUAL DPDT, NC
	SWITCH – MANUAL SPDT
	SWITCH – MANUAL DPDT
	SWITCH – PRESSURE & VACUUM, NO
	SWITCH – PRESSURE & VACUUM, NC
	SWITCH – TEMPERATURE ACTUATED, NO
	SWITCH – TEMPERATURE ACTUATED, NC
	THERMAL OVERLOAD, SINGLE PHASE
OL'S	THERMAL OVERLOAD CONTACTS – 3 PHASE
	TRANSFORMER
	WIRE TERMINATION AT DEVICE
	WIRE TO WIRE TERMINATION
	WIRING NOT CONNECTED

WIRING TERMS

ABBREVIATION	DESCRIPTION
SPST	SINGLE POLE SINGLE THROW
SPDT	SINGLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DPDT	DOUBLE POLE DOUBLE THROW
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NOTC	NORMALLY OPEN TIMED CLOSED
NCTO	NORMALLY CLOSED TIMED OPEN
NCTC	NORMALLY CLOSED TIMED CLOSED

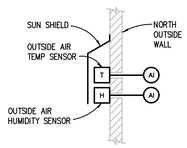
NOTE: SOME SYMBOLS & ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.

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	ALTERNATE
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
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
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
SZ	SINGLE ZONE
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
WC	WATER COLUMN
XFMR	TRANSFORMER

TC GENERAL NOTES

1. THESE GENERAL NOTES SHALL BE APPLICABLE FOR ALL TEMPERATURE CONTROL (TC) DRAWINGS.
2. "PROVIDE" IS DEFINED AS 'FURNISH AND INSTALL".
3. TEMPERATURE CONTROLS CONTRACTOR (TC CONTRACTOR) SHALL BE RESPONSIBLE TO COMPLY WITH ALL APPLICABLE CODES AND STANDARDS.
4. FOR TEMPERATURE CONTROL DRAWINGS ONLY: ALL DETAILED INFORMATION IDENTIFIED WITH HEAVY LINE WEIGHT SHALL BE PROVIDED BY TC CONTRACTOR. ALL OTHER INFORMATION IDENTIFIED WITH LIGHT LINE WEIGHT SHALL BE PROVIDED BY OTHER TRADES.
5. ALL CONTROL SCHEMATICS AND WIRING DIAGRAMS ARE FOR THE CLARIFICATION OF EQUIPMENT INTERLOCKING FUNCTIONS AND THE INTERFACE OF VARIOUS CONTRACTORS' WORK AND SHALL NOT BE MISTAKEN AS SHOP DRAWINGS FOR ACTUAL INSTALLATION.
6. 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.
7. ALL TC PROVIDED COMPONENTS AND ALL TC CONTRACTOR INSTALLED WIRING SHALL BE LABELED PER SPECIFICATIONS.
8. ALL WIRING AND SYSTEM CONTROL VOLTAGES SHALL BE IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATION AND THE ELECTRICAL SPECIFICATIONS.
9. VARIABLE FREQUENCY CONTROLLER, FAN AND PUMP MOTOR STARTERS, STARTER WIRING, CONTROL VOLTAGE TRANSFORMERS AND ASSOCIATED POWER WIRING SHALL BE PROVIDED BY OTHER TRADES.
10. DUCT SMOKE DETECTORS SHALL BE FURNISHED, INSTALLED AND WIRED TO THE FIRE ALARM SYSTEM BY THE ELECTRICAL CONTRACTOR. ELECTRICAL SHALL PROVIDE FIRE ALARM SYSTEM CONTROL MODULES FOR REQUIRED SAFETIES TO MOTOR STARTERS OR VFC'S AS INDICATED. CONTROL MODULES SHALL BE LOCATED NEAR RESPECTIVE MOTOR STARTERS OR VFCs. TC CONTRACTOR SHALL PROVIDE INTERLOCK WIRING FROM CONTROL MODULES TO MOTOR STARTERS OR VFCs.
11. ALL DDC AND CONTROL INTERLOCK WIRING SHALL BE BY TC CONTRACTOR UNLESS OTHERWISE NOTED. TC CONTRACTOR SHALL COORDINATE WITH VFC AND MOTOR STARTER SUPPLIERS TO DETERMINE EXACT WIRING REQUIREMENTS AND TERMINATION POINTS.
12. ALL DDC AND CONTROL INTERLOCK WIRING BETWEEN COMPONENTS SHALL BE INSTALLED WITHOUT INTERMEDIATE STOPS. WIRE SPLICING AT INTERMEDIATE TERMINAL STRIPS IS NOT ACCEPTABLE.
13. ALL ELECTRICAL WIRING AND RACEWAY SYSTEMS SHALL COMPLY WITH ELECTRICAL SPECIFICATION REQUIREMENTS. WHERE RACEWAY IS REQUIRED, TWO SEPARATE ELECTRICAL RACEWAY SYSTEMS SHALL BE PROVIDED: ONE FOR 120V WIRING AND THE OTHER FOR 24V WIRING.
14. TC CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER SUPPLIES REQUIRED FOR TC SYSTEM UNLESS OTHERWISE NOTED. REFER TO ELECTRICAL PANEL SCHEDULES FOR SPARE CIRCUITS OR CIRCUITS DEDICATED TO TEMPERATURE CONTROLS. COORDINATE CIRCUIT USE WITH ELECTRICAL CONTRACTOR.
15. TC CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL FIELD MOUNTED COMPONENTS.
16. THERMOSTATS AND SPACE TEMPERATURE SENSORS SHALL BE MOUNTED 4'–0" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE. PROVIDE GUARDS FOR SPACE TEMP SENSORS LOCATED IN PUBLIC AREA.
17. 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. DEPENDING ON WIRE QUANTITY OR COMPLEXITY, PROVIDE CONDUITS BETWEEN PANELS OR WIRING THROUGH WITH CONDUIT STUBS ABOVE ALL ASSOCIATED PANELS.
18. REMOTELY MOUNTED FIELD DEVICES SUCH AS RELAYS, CONTROL TRANSFORMERS, ETC., SHALL BE HOUSED IN AN ENCLOSURE PROVIDED BY THE TC CONTRACTOR.
19. CONTROL TRANSFORMERS WHEN REQUIRED SHALL BE SIZED FOR 150% OF ACTUAL LOAD.
20. FREEZESTATS SHALL BE MOUNTED ON UPSTREAM FACE OF COOLING COILS. FREEZESTAT QUANTITY SHALL BE ONE PER 20 SQ. FT OF CROSS SECTIONAL AREA.
21. CURRENT SWITCHES USED FOR OPERATIONAL STATUS SHALL HAVE CURRENT THRESHOLD SETPOINT ADJUSTED TO INDICATE BELT OR DRIVE FAILURE.
22. ALL CONTROL VALVES, CONTROL DAMPERS AND ASSOCIATED CONTROL ACTUATORS IDENTIFIED ON TC DRAWINGS SHALL BE FURNISHED BY TC CONTRACTOR UNLESS OTHERWISE NOTED. DAMPER SIZE AND LOCATIONS ARE INDICATED ON MECHANICAL FLOOR PLAN DRAWINGS.
23. ALL CONTROL VALVES AND DAMPERS FURNISHED BY THE TC CONTRACTOR SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR. ALL PIPE PENETRATIONS AND BASIC FITTINGS REQUIRED FOR SENSOR INSTALLATIONS SHALL BE PROVIDED BY MECHANICAL CONTRACTOR.
24. DAMPER ACTUATORS SHALL BE INSTALLED BY TC CONTRACTOR WHEN FURNISHED BY TC CONTRACTOR.
25. ALL INSTRUMENTATION TUBING REQUIRED FOR DPS AND DPT COMPONENT INSTALLATIONS SHALL BE PROVIDED BY TC CONTRACTOR.
26. TC CONTRACTOR SHALL FIELD MOUNT ALL REQUIRED "SHIPPED LOOSE" PACKAGED CONTROL COMPONENTS FURNISHED BY EQUIPMENT SUPPLIERS WHERE INDICATED. ALL REQUIRED 24V AND 120V FIELD WIRING SHALL BE PROVIDED BY TC CONTRACTOR UNLESS NOTED OTHERWISE. TC CONTRACTOR SHALL COORDINATE SPECIFIC SYSTEM WIRING REQUIREMENTS WITH PACKAGED EQUIPMENT SUPPLIERS.

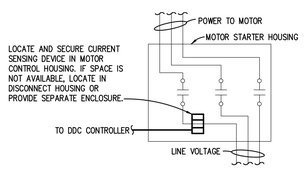


OA SENSOR INSTALLATION DETAIL

NO SCALE

NOTES:

1. TC CONTRACTOR HAS THE OPTION OF USING EXISTING OA TEMP AND HUMIDITY SENSORS AS AVAILABLE FOR BUILDING.
2. CALCULATE OA ENTHALPY OR DEW POINT TEMPERATURE AS REQUIRED PER SEQUENCE OF OPERATION REQUIREMENTS.
3. BROADCAST OUTSIDE AIR TEMPERATURE, HUMIDITY, AND CALCULATED OA ENTHALPY OR DEWPOINT TEMPERATURE, AS REQUIRED, THROUGH BAS COMMUNICATION NETWORK TO CONTROLLERS REQUIRING INFORMATION FOR DDC PROGRAMMING LOGIC.



CURRENT SWITCH INSTALLATION DETAIL

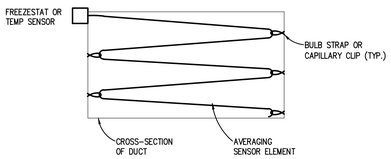
TYPICAL

NOTES:

1. MOUNT CURRENT SWITCH ON MOTOR LEADS.
2. WHERE INDICATED ON CONTROL DETAILS, CURRENT SWITCHES SHALL BE INSTALLED FOR DDC SYSTEM STATUS INDICATION OF FAN OR PUMP OPERATION.
3. CURRENT SWITCH SHALL BE ADJUSTED TO MEET THE CURRENT DRAW REQUIRED TO DETECT FAN BELT LOSS, PUMP COUPLING DETACHMENT, OR VFC LOSS.

SEQUENCE OF OPERATION:

1. 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. WHEN NOT IN ALARM, DDC SYSTEM SHALL TOTALIZE RUN TIME HOURS FOR OPERATOR INFORMATION FROM BUILDING AUTOMATION SYSTEM OPERATOR INTERFACE.

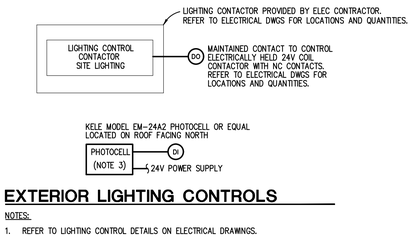


AVERAGING ELEMENT INSTALLATION DETAIL

TYPICAL

NOTES:

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.



EXTERIOR LIGHTING CONTROLS

NOTES:

1. REFER TO LIGHTING CONTROL DETAILS ON ELECTRICAL DRAWINGS.
2. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH ELECTRICAL CONTRACTOR.
3. TC CONTRACTOR SHALL PROVIDE PHOTOCELL, 24V POWER SUPPLY AND ASSOCIATED WIRING FOR BAS MONITORING AND CONTROL OF EXTERIOR LIGHTING.

SEQUENCE OF OPERATION

NOTES:

1. REFER TO LIGHTING CONTROL DETAILS ON ELECTRICAL DRAWINGS.
2. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH ELECTRICAL CONTRACTOR.
3. TC CONTRACTOR SHALL PROVIDE PHOTOCELL, 24V POWER SUPPLY AND ASSOCIATED WIRING FOR BAS MONITORING AND CONTROL OF EXTERIOR LIGHTING.

SEQUENCE OF OPERATION:

1. FOR EXTERIOR LIGHTING CONTROLS: DDC MONITORED PHOTOCELL SHALL BE USED FOR "ON" AND "OFF" CONTROL OF EXTERIOR LIGHTS.
2. "OFF" CONTROL MAY BE FROM BAS TIME OF DAY SCHEDULED OPERATION AS DIRECTED BY OWNER.

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES

ISSUE DATES

05–27–2020	FOR CONSTRUCTION – BID PACK #3
05–01–2020	95% REVIEW – BP3
12–06–2019	DESIGN DEVELOPMENT
08–12–2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN DJT
CHECKED SVM
APPROVED RNR

PROJECT NO.

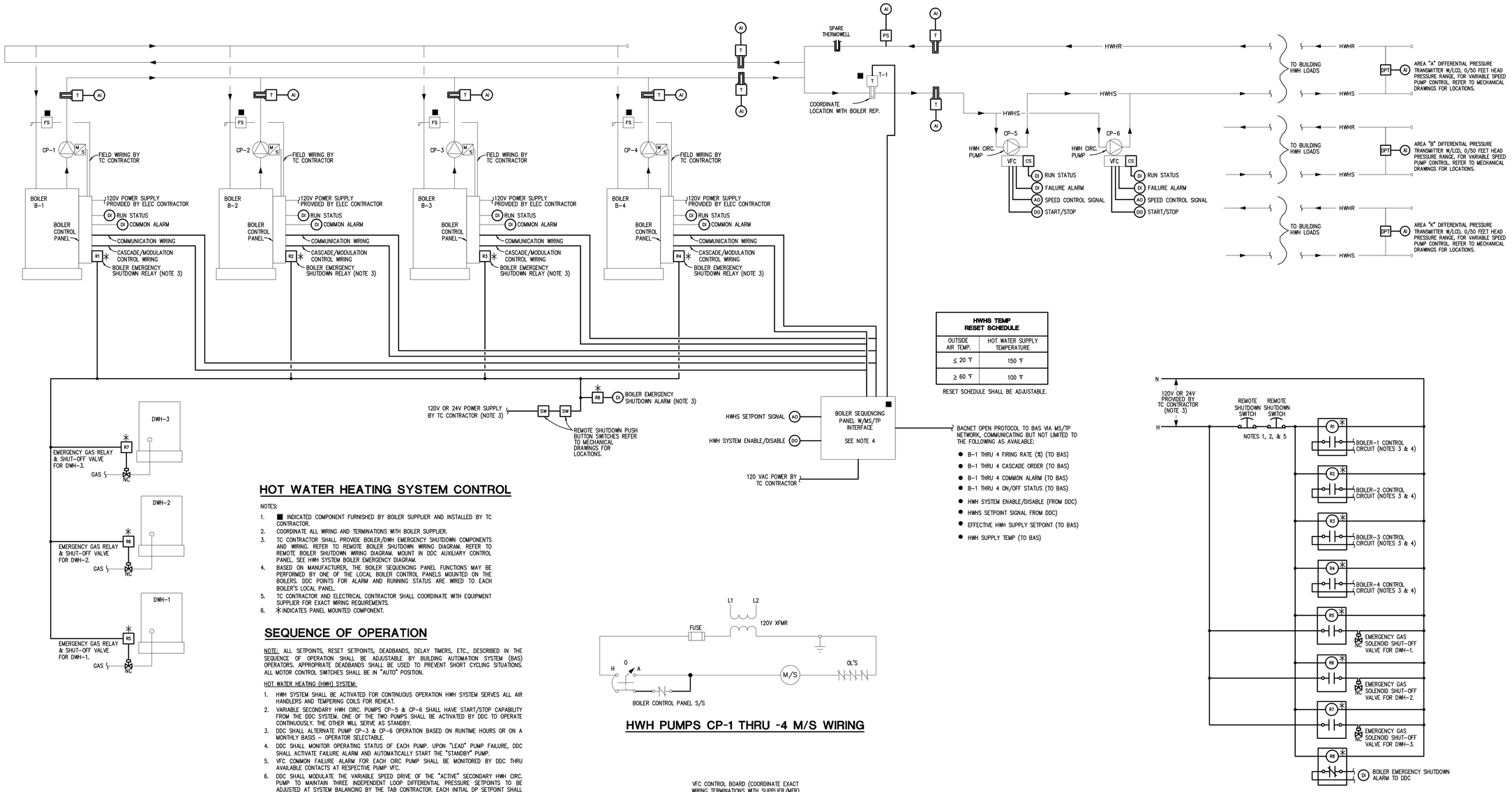
19040

DRAWING NO.

M8.1-BP3

TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M8.1 APPLY TO THIS DRAWING.



HWHS TEMP RESET SCHEDULE

OUTSIDE AIR TEMP.	HOT WATER SUPPLY TEMPERATURE
≤ 20 °F	150 °F
≥ 60 °F	100 °F

RESET SCHEDULE SHALL BE ADJUSTABLE.

BACNET OPEN PROTOCOL TO BAS VIA MS/TP NETWORK, COMMUNICATING BUT NOT LIMITED TO THE FOLLOWING AS AVAILABLE:

- B-1 THRU 4 FIRING RATE (%) (TO BAS)
- B-1 THRU 4 CASCADE ORDER (TO BAS)
- B-1 THRU 4 COMMON ALARM (TO BAS)
- B-1 THRU 4 ON/OFF STATUS (TO BAS)
- HWH SYSTEM ENABLE/DISABLE (FROM DDC)
- HWHS SETPOINT SIGNAL FROM DDC)
- EFFECTIVE HWH SUPPLY SETPOINT (TO BAS)
- HWH SUPPLY TEMP (TO BAS)

HOT WATER HEATING SYSTEM CONTROL

NOTES:

1. ■ INDICATED COMPONENT FURNISHED BY BOILER SUPPLIER AND INSTALLED BY TC CONTRACTOR.
2. COORDINATE ALL WIRING AND TERMINATIONS WITH BOILER SUPPLIER.
3. TC CONTRACTOR SHALL PROVIDE BOILER/DWH EMERGENCY SHUTDOWN COMPONENTS AND WIRING. REFER TO REMOTE BOILER SHUTDOWN WIRING DIAGRAM. REFER TO REMOTE BOILER SHUTDOWN WIRING DIAGRAM. MOUNT IN DDC AUXILIARY CONTROL PANEL. SEE HWH SYSTEM BOILER EMERGENCY DIAGRAM.
4. BASED ON MANUFACTURER, THE BOILER SEQUENCING PANEL FUNCTIONS MAY BE PERFORMED BY ONE OF THE LOCAL BOILER CONTROL PANELS MOUNTED ON THE BOILERS. DDC POINTS FOR ALARM AND RUNNING STATUS ARE WIRED TO EACH BOILER'S LOCAL PANEL.
5. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
6. ✳ INDICATES PANEL MOUNTED COMPONENT.

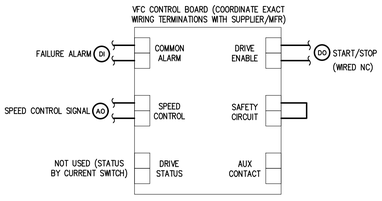
SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

HOT WATER HEATING (HWH) SYSTEM:

1. HWH SYSTEM SHALL BE ACTIVATED FOR CONTINUOUS OPERATION HWH SYSTEM SERVES ALL AIR HANDLERS AND TEMPERING COILS FOR REHEAT.
2. VARIABLE SECONDARY HWH CIRC. PUMPS CP-5 & CP-6 SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ONE OF THE TWO PUMPS SHALL BE ACTIVATED BY DDC TO OPERATE CONTINUOUSLY. THE OTHER WILL SERVE AS STANDBY.
3. DDC SHALL ALTERNATE PUMP CP-3 & CP-6 OPERATION BASED ON RUNTIME HOURS OR ON A MONTHLY BASIS – OPERATOR SELECTABLE.
4. DDC SHALL MONITOR OPERATING STATUS OF EACH PUMP. UPON "LEAD" PUMP FAILURE, DDC SHALL ACTIVATE FAILURE ALARM AND AUTOMATICALLY START THE "STANDBY" PUMP.
5. VFC COMMON FAILURE ALARM FOR EACH CIRC PUMP SHALL BE MONITORED BY DDC THRU AVAILABLE CONTACTS AT RESPECTIVE PUMP VFC.
6. DDC SHALL MODULATE THE VARIABLE SPEED DRIVE OF THE "ACTIVE" SECONDARY HWH CIRC. PUMP TO MAINTAIN THREE INDEPENDENT LOOP DIFFERENTIAL PRESSURE SETPOINTS TO BE ADJUSTED AT SYSTEM BALANCING BY THE TAB CONTRACTOR. EACH INITIAL DP SETPOINT SHALL BE 25 FEET OF HEAD PRESSURE. DDC SHALL COMPARE DP READING TO DP SETPOINT AND INCREASE/DECREASE PUMP VFC SPEED UNTIL THE LOWEST DP SENSOR IS AT SETPOINT. DDC SHALL NOT DECREASE THE "ACTIVE" SECONDARY HWH CIRC. PUMP BELOW THE MANUFACTURER'S CURVE FOR LOWEST PUMP SPEED. THREE-WAY VALVES IN THE SYSTEM PROVIDE RETURN WATER FLOW PATH.
7. BOILER LOCAL/REMOTE SWITCH SHALL BE IN REMOTE POSITION. REMOTE CONTROL SHALL BE THRU BOILER SEQUENCING PANEL FURNISHED BY BOILER SUPPLIER. DDC SYSTEM SHALL ENABLE BOILER SEQUENCING PANEL CONTROL WHEN SECONDARY HWH CIRC. PUMP CP-5 OR CP-6 IS ACTIVATED.
8. WHENEVER A BOILER IS ACTIVATED, ITS RESPECTIVE PRIMARY CIRC. PUMP CP-1 THRU -4 SHALL BE ACTIVATED FROM THE LOCAL BOILER CONTROL PANEL FROM A FACTORY WIRED CONTROL RELAY. WHENEVER A BOILER IS DE-ACTIVATED, ITS RESPECTIVE PRIMARY CIRC. PUMP SHALL RUN FOR A FEW EXTRA MINUTES (BASED ON THE BOILER MANUFACTURER'S RECOMMENDATION) TO DISSIPATE HEAT FROM THE DEACTIVATED BOILER. A FACTORY-PROVIDED WATER FLOW SWITCH AT EACH BOILER SHALL PROVE WATER FLOW TO THE LOCAL CONTROL PANEL BEFORE THE BOILER IS ALLOWED TO FIRE.
9. THE LOCAL CONTROL PANELS DETERMINE BURNER MODULATION TO MAINTAIN HWH SUPPLY TEMP (T-1, FACTORY PROVIDED) SETPOINT BASED ON BAS OUTDOOR AIR RESET SCHEDULE. THE MASTER SEQUENCING PANEL SHALL PROVIDE CASCADE CONTROL, ACTIVATE LOW FIRE/HIGH FIRE OPERATION OF BOTH BOILERS, AND PROVIDE ALTERNATION. BASED ON THE BOILER MANUFACTURER, THE MASTER SEQUENCING MAY BE PERFORMED IN THE BOILER CONTROLLER.
10. THE BOILER SEQUENCING PANEL SHALL INCLUDE OPERATOR SELECTABLE BOILER LEAD/LAG OPERATION OR FIRST ON/FIRST OFF OPERATION.
11. EACH BOILER LOCAL CONTROL PANEL SHALL INCLUDE AN OPERATOR LIMIT WITH SETPOINT (TO BE USED WHEN BOILER LOCAL/REMOTE SWITCH IS IN LOCAL POSITION) AND A MANUAL-RESET HI-LIMIT SAFETY WITH SETPOINT. THESE SETPOINTS ARE TO BE ESTABLISHED BY THE BOILER SUPPLIER REPRESENTATIVE.
12. DDC SHALL MONITOR ALL BOILERS THROUGH MS/TP COMMUNICATION CARD PROVIDED BY BOILER MFR. ALLOW FOR 20 POINTS OF INFORMATION DISPLAYED AT BAS.
13. DDC SHALL MONITOR ALL OTHER TEMPERATURE SENSORS FOR DIAGNOSTIC AND BAS DISPLAY PURPOSES.
14. ALL BOILERS SHALL BE CONNECTED TO MECH ROOM EMERGENCY SHUTDOWN SYSTEM. (REFER TO WIRING DETAILS ON THIS SHEET).
15. IF IN THE EVENT THAT THE HWH SECONDARY SYSTEM PRESSURE DROPS BELOW ITS SETPOINT (INDICATING A SYSTEM WATER LEAK), DDC SHALL AUTOMATICALLY ISSUE AN ALARM TO THE BAS.

HWH PUMPS CP-1 THRU -4 M/S WIRING



HWH PUMPS CP-5 & -6 VFC WIRING

TYPICAL

NOTE:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.

MECH ROOM EMERGENCY SHUTDOWN WIRING

NOTES:

1. LOCATE AN EMERGENCY SHUTDOWN SWITCH AT EACH ENTRANCE JUST INSIDE BOILER ROOM. REFER TO MECHANICAL DRAWINGS FOR QUANTITY AND LOCATION OF ROOM ENTRANCES. COORDINATE SWITCH LOCATIONS WITH ALL OTHER TRADES.
2. TC CONTRACTOR SHALL PROVIDE SIGN (NAME PLATE) TO BE PLACED DIRECTLY ABOVE OR BELOW EACH PUSH BUTTON SWITCH THAT READS: "BOILER/DWH EMERGENCY SHUTDOWN SWITCH".
3. TC CONTRACTOR SHALL SUPPLY POWER TO CONTROL RELAY FROM COMMERCIAL POWER CIRCUIT. REFER TO ELECTRICAL PANEL SCHEDULES AND COORDINATE WITH ELECTRICAL CONTRACTOR AS NECESSARY. COORDINATE WITH THE ELECTRICAL CONTRACTOR TO PROVIDE A LOCKOUT AT THE CIRCUIT BREAKER.
4. TC CONTRACTOR SHALL PROVIDE POWER TO CONTROL RELAYS AND SOLENOID VALVE. REFER TO ELECTRICAL PANEL SCHEDULES AND COORDINATE WITH ELECTRICAL CONTRACTOR AS NECESSARY.
5. TC CONTRACTOR SHALL MOUNT BOILER'S SHUTDOWN CONTROL RELAYS AT RESPECTIVE BOILER CONTROL PANELS. TC CONTRACTOR SHALL WIRE BOILERS' CONTROL CIRCUITS (POWER FROM SECONDARY SIDE OF CONTROL TRANSFORMERS) THRU NORMALLY OPEN RELAY CONTACTS. TC CONTRACTOR SHALL COORDINATE EXACT WIRING AND TERMINATION REQUIREMENTS WITH BOILER MANUFACTURER.
6. TC CONTRACTOR SHALL PROVIDE PUSHBUTTON SWITCHES (PUSH TO LATCH – TURN KEY TO RELEASE) WITH MUSHROOM HEAD OPERATOR AND NORMALLY CLOSED (NC) CONTACTS. PROVIDE WITH PROPER ENCLOSURE.

SEQUENCE OF OPERATION

1. UNDER NORMAL OPERATING CONDITIONS THE CIRCUIT SHALL BE ENERGIZED AND THE CUT-OUT RELAYS' NORMALLY OPEN (NO) CONTACTS SHALL BE CLOSED TO ENERGIZE BOILER CONTROL CIRCUITS AND OPEN THE DOMESTIC HW SYSTEMS NATURAL GAS SOLENOID VALVES.
2. WHEN A REMOTE SWITCH IS PUSHED (LATCHED) THE CUT-OUT RELAY CONTACTS SHALL INTERRUPT BOILERS' CONTROL CIRCUITS AND CLOSE THE DOMESTIC HW SYSTEM SOLENOID VALVE. THE SWITCH MUST BE MANUALLY RELEASED TO ALLOW NORMAL OPERATION.
3. DDC SHALL ACTIVATE EMERGENCY SHUTDOWN ALARM IN DDC SYSTEM WHEN A REMOTE SWITCH HAS BEEN PUSHED.

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

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DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN DJT

CHECKED SVM

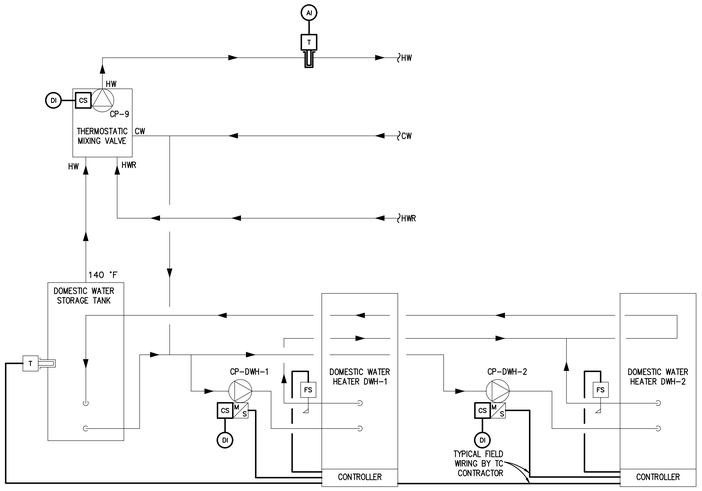
APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M8.2-BP3



DWH-1 & 2 SYSTEM MONITORING & CONTROL

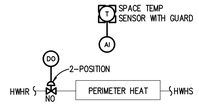
NOTES:

1. DOMESTIC WATER HEATERS ARE PROVIDED WITH PACKAGED CONTROLS. TC CONTRACTOR SHALL PROVIDE FIELD WIRING AS SHOWN.
2. TC CONTRACTOR SHALL PROVIDE EMERGENCY GAS SHUTDOWN WIRING AND RELAY AS SHOWN.
3. PUMP CP-9'S AQUASTAT, S/S RELAY, AND CURRENT SWITCH AND PUMP CP-X CURRENT SWITCH SHALL BE PROVIDED BY TC CONTRACTOR. COORDINATE WIRING REQUIREMENTS WITH THE EQUIPMENT SUPPLIER.
4. STORAGE TANK TEMPERATURE SENSOR FURNISHED BY DWH MFR. AND WIRED BY TC CONTRACTOR.

SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. DOMESTIC WATER CIRC PUMP CP-9 SHALL BE ENABLE/DISABLED BY THERMOSTATIC MIXING VALVE CONTROLLER.
2. DOMESTIC WATER HEATER CIRC PUMPS CP-DWH-1 & CP-DWH-2 SHALL BE STARTED/STOPPED BY THEIR RESPECTIVE DWH CONTROLLER.
3. DDC SHALL MONITOR CIRC PUMP CP-9 THRU CURRENT SWITCH AND TOTALIZE PUMP MOTOR RUN TIME HOURS OF OPERATION FOR BAS STATUS DISPLAY.
4. DDC SHALL MONITOR THE HW SUPPLY TEMPERATURE TO THE BUILDING AND PROVIDE DISPLAY FOR SYSTEM OPERATORS WITH HIGH ALARM AT 5°F SETPOINT ABOVE THERMOSTATIC MIXING VALVE SETPOINT AND LOW ALARM AT 125°F SETPOINT.



(OR 3-WAY VALVE CONFIGURATION DEPENDING ON MECHANICAL DETAIL)

STANDALONE PERIMETER HEATING CONTROL

TYPICAL FOR CONVECTORS, FINNED TUBE RADIATION, RADIANT WALL PANELS, AND RADIANT CEILING PANELS NOT ASSOCIATED WITH DDC TERMINAL UNIT CONTROLLERS.

NOTES:

1. REFER TO MECHANICAL DRAWINGS FOR QUANTITY AND LOCATION OF UNITS.

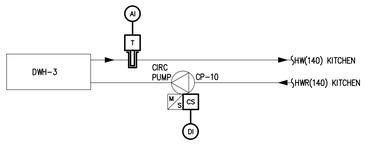
SEQUENCE OF OPERATION

NOTES:

1. REFER TO MECHANICAL DRAWINGS FOR QUANTITY AND LOCATION OF UNITS.

SEQUENCE OF OPERATION:

1. ALL SETPOINTS AND DEADBANDS SHALL BE ADJUSTABLE THROUGH DDC.
2. WHEN OUTSIDE AIR TEMPERATURE IS BELOW 45°F, DDC SHALL OPEN/CLOSE HWH VALVE AS REQUIRED TO MAINTAIN SPACE TEMP SETPOINT OF 60°F. DDC SHALL PROVIDE A 2°F DEADBAND AROUND SETPOINTS FOR CONTROL.
3. WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 47°F, DDC SHALL COMMAND THE HWH VALVE CLOSED.

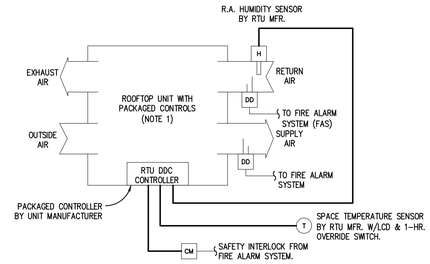


DWH-3 SYSTEM MONITORING

SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. DDC SHALL MONITOR THE HW(140) SUPPLY TEMPERATURE TO THE KITCHEN AND PROVIDE DISPLAY FOR SYSTEM OPERATORS WITH HIGH ALARM AT 5°F SETPOINT ABOVE DWH-3 SETPOINT AND LOW ALARM AT 135°F SETPOINT.
2. CP-10 SHALL RUN CONTINUOUSLY.



RTU-12 SZ-VAV CONTROL

RTU-12 SERVES MUSIC

NOTES:

1. MUSIC ROOF TOP UNIT (RTU) SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS FROM MANUFACTURER INCLUDING DDC CONTROLLER, BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, SPACE AND HUMIDITY SETPOINT ADJUSTMENT AND UNIT MONITORING.
2. SINGLE POINT POWER SUPPLY CONNECTION SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR. TC CONTRACTOR SHALL INSTALL SPACE TEMPERATURE AND HUMIDITY SENSORS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARDS FOR SPACE SENSORS. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE. TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO DEHUMIDIFICATION UNIT SAFETY CUTOUT CIRCUIT.
4. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM RTU CONTROL PANEL TO NEW BAS NETWORK SUPERVISORY CONTROLLER. TC CONTRACTOR SHALL PROVIDE FIELD WIRING FOR CONTROLS AS INDICATED AND REQUIRED FOR PACKAGED UNIT TEMPERATURE CONTROLS.
5. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
6. RTU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR RTU START-UP, PROGRAMMING OF RTU, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.
7. TC CONTRACTOR SHALL PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN.

SEQUENCE OF OPERATION

NOTES:

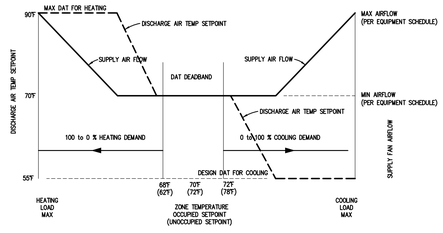
NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. PACKAGED CONTROLS SHALL OPERATE FROM BAS TIME OF DAY BUILDING OCCUPANCY SCHEDULE, DEHUMIDIFICATION CONTROL FROM RETURN AIR HUMIDITY SENSOR WITH HOT-GAS REHEAT COIL AND PROVIDE VARIABLE VOLUME/VARIABLE TEMPERATURE CONTROL FROM SPACE TEMP SENSOR WITH DX COOLING AND GAS-FIRED HEATING CONTROLS, MINIMUM OUTSIDE AIRFLOW WITH DEMAND CONTROLLED VENTILATION, AND UNIT MONITORING.
2. PACKAGED CONTROLS SHALL OPERATE FAN(S) CONTINUOUSLY IN OCCUPIED MODE AND SHALL CYCLE FAN(S) IN UNOCCUPIED MODE. PACKAGED CONTROLS SHALL PROVIDE DUAL ENTHALPY ECONOMIZER AND MINIMUM OUTSIDE AIR DAMPER CONTROL.
3. PACKAGED CONTROLS SHALL RESET DISCHARGE AIR TEMPERATURE AND CONTROL AIR VOLUME BASED ON RESET SCHEDULE SHOWN ON THIS SHEET FROM THE SPACE TEMPERATURE SENSOR.
4. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE RTU THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
5. SPACE TEMP SETPOINTS SHALL BE:

UNOCCUPIED HEATING SETPOINT:	62°F (ADJUSTABLE)
OCCUPIED HEATING SETPOINT:	70°F (ADJUSTABLE)
OCCUPIED COOLING SETPOINT:	74°F (ADJUSTABLE)
UNOCCUPIED COOLING SETPOINT:	82°F (ADJUSTABLE)

6. PACKAGED CONTROLLER WITH LCD AND USER MENUS PROVIDES THE FOLLOWING (BUT NOT LIMITED TO) POINTS AS AVAILABLE:

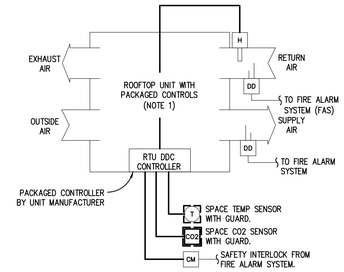
- OCCUPANCY MODE SCHEDULE (FROM BAS)
- EFFECTIVE OCCUPANCY MODE (TO BAS)
- SUPPLY/EXHAUST FAN RUN STATUS (TO BAS)
- OCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- OCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- OUTSIDE AIRFLOW CONTROL (TO BAS)
- DISCHARGE, OUTSIDE AIR, AND SPACE TEMPERATURE (TO BAS)
- HEATING/COOLING MODE STATUS (TO BAS)
- DEHUMIDIFICATION STATUS (TO BAS)
- HEATING OUTPUT STATUS (TO BAS)
- ECONOMIZER MODE STATUS (OVERRIDES DCV MODE) (TO BAS)
- COMPRESSOR ENABLE STATUS, EACH STAGE (TO BAS)
- DIRTY FILTER STATUS/ALARM (TO BAS)
- MISC UNIT TEMPERATURE MONITORING (TO BAS)
- TEMP SENSOR FAILURE ALARMS (TO BAS)
- UNIT SAFETY CUTOUT ALARMS (TO BAS)
- OTHER MISC ALARMS (TO BAS)



RTU-5 & -12 SPACE TEMP / AIRFLOW RESET SCHEDULE DIAGRAM

TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M8.1 APPLY TO THIS DRAWING.



RTU-5 SZ-VAV CONTROL

RTU-5 SERVES GYMNASIUM

NOTES:

1. GYMNASIUM ROOF TOP UNIT (RTU) SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS FROM MANUFACTURER INCLUDING DDC CONTROLLER, BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, SPACE AND HUMIDITY SETPOINT ADJUSTMENT AND UNIT MONITORING.
2. SINGLE POINT POWER SUPPLY CONNECTION SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR. TC CONTRACTOR SHALL INSTALL SPACE TEMPERATURE, HUMIDITY, AND CO2 SENSORS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARDS FOR SPACE SENSORS. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE. TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO DEHUMIDIFICATION UNIT SAFETY CUTOUT CIRCUIT.
4. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM RTU CONTROL PANEL TO NEW BAS NETWORK SUPERVISORY CONTROLLER. TC CONTRACTOR SHALL PROVIDE FIELD WIRING FOR CONTROLS AS INDICATED AND REQUIRED FOR PACKAGED UNIT TEMPERATURE CONTROLS.
5. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
6. RTU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR RTU START-UP, PROGRAMMING OF RTU, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.
7. TC CONTRACTOR SHALL PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN.

SEQUENCE OF OPERATION

GYM RTU SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. PACKAGED CONTROLS SHALL OPERATE FROM BAS TIME OF DAY BUILDING OCCUPANCY SCHEDULE, DEHUMIDIFICATION CONTROL FROM RETURN AIR HUMIDITY SENSOR WITH HOT-GAS REHEAT COIL, AND PROVIDE VARIABLE VOLUME/VARIABLE TEMPERATURE CONTROL FROM SPACE TEMP SENSOR WITH DX COOLING AND GAS-FIRED HEATING CONTROLS, MINIMUM OUTSIDE AIRFLOW WITH DEMAND CONTROLLED VENTILATION, AND UNIT MONITORING.
2. RTU WITH PACKAGED CONTROLS SHALL PROVIDE DEHUMIDIFICATION CONTROL BASED ON RETURN AIR HUMIDITY SENSOR, FREE COOLING ECONOMIZER BASED ON DUAL ENTHALPY COMPARISON, HEATING & COOLING CONTROL TO PROVIDE SPACE TEMPERATURE RESET OF DISCHARGE AIR TEMPERATURE (CASCADE CONTROL). DAT SHALL NOT EXCEED 100°F FOR HEATING OR DECREASE BELOW 55°F FOR COOLING.
3. RTU PACKAGED CONTROLS SHALL OPERATE RTU FAN(S) CONTINUOUSLY IN OCCUPIED MODE, AND NIGHT CYCLE FAN(S) IN UNOCCUPIED MODE.
4. RTU WITH PACKAGED CONTROLS SHALL PROVIDE BACnet OPEN PROTOCOL COMMUNICATIONS INTERFACE CONNECTED TO OWNER'S BUILDING AUTOMATION SYSTEM THRU DDC NETWORK.
5. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE RTU THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
6. SPACE TEMP SETPOINTS SHALL BE:

UNOCCUPIED HEATING SETPOINT:	62°F (ADJUSTABLE)
OCCUPIED HEATING SETPOINT:	70°F (ADJUSTABLE)
OCCUPIED COOLING SETPOINT:	74°F (ADJUSTABLE)
UNOCCUPIED COOLING SETPOINT:	82°F (ADJUSTABLE)

7. PACKAGED CONTROLLER WITH LCD AND USER MENUS PROVIDES THE FOLLOWING (BUT NOT LIMITED TO) POINTS AS AVAILABLE:

- OCCUPANCY MODE SCHEDULE (FROM BAS)
- EFFECTIVE OCCUPANCY MODE (TO BAS)
- SUPPLY AND EXHAUST FAN RUN STATUS (TO BAS)
- OCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- OCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- OUTSIDE AIRFLOW CONTROL (TO BAS)
- DISCHARGE, OUTSIDE AIR, AND SPACE TEMPERATURE (TO BAS)
- HEATING/COOLING MODE STATUS (TO BAS)
- DEHUMIDIFICATION STATUS (TO BAS)
- HEATING OUTPUT STATUS (TO BAS)
- ECONOMIZER MODE STATUS (OVERRIDES DCV MODE) (TO BAS)
- DVC MODE STATUS (TO BAS)
- COMPRESSOR ENABLE STATUS, EACH STAGE (TO BAS)
- DIRTY FILTER STATUS/ALARM (TO BAS)
- MISC UNIT TEMPERATURE MONITORING (TO BAS)
- TEMP SENSOR FAILURE ALARMS (TO BAS)
- UNIT SAFETY CUTOUT ALARMS (TO BAS)
- OTHER MISC ALARMS (TO BAS)

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

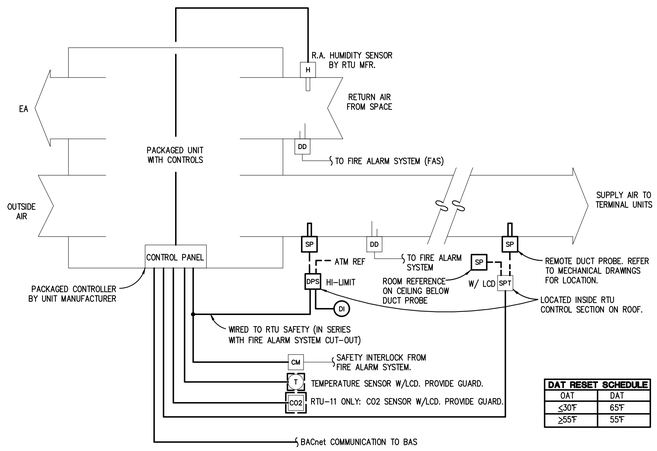
DRAWN DJT
CHECKED SVM
APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M8.3-BP3



DAT RESET SCHEDULE	
OAT	DAT
≤30°F	65°F
≥65°F	55°F

RTU-N VAV W/DUCT STATIC PRESSURE CONTROL

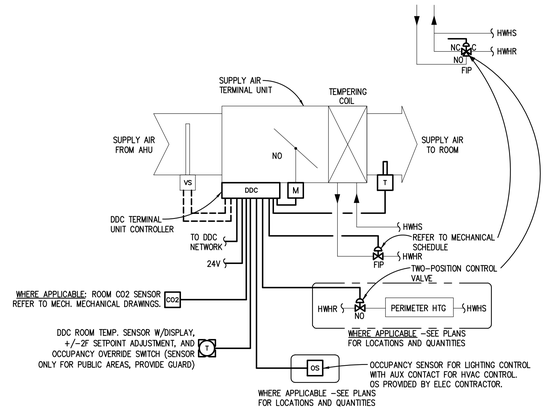
RTU-1, 2, 3, 4, 6, 7, 8, 9, 11, & 13,

1. VAV W/DUCT STATIC CONTROL ROOF TOP UNIT (RTU) SHALL BE SUPPLIED FOR PROJECT WITH PACKAGED CONTROLS FROM MANUFACTURER INCLUDING DDC CONTROLLER, BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, SPACE AND HUMIDITY SETPOINT ADJUSTMENT AND UNIT MONITORING.
2. SINGLE POINT POWER SUPPLY CONNECTION SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR. TC CONTRACTOR SHALL INSTALL SPACE TEMPERATURE AND HUMIDITY SENSORS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARDS FOR SPACE SENSORS. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE. TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO DEHUMIDIFICATION UNIT SAFETY CUTOUT CIRCUIT.
4. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM RTU CONTROL PANEL TO NEW BAS NETWORK SUPERVISORY CONTROLLER. TC CONTRACTOR SHALL PROVIDE FIELD WIRING FOR CONTROLS AS INDICATED AND REQUIRED FOR PACKAGED UNIT TEMPERATURE CONTROLS.
5. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
6. RTU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR RTU START-UP, PROGRAMMING OF RTU, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.
7. TC CONTRACTOR SHALL PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN.

SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. RTU WITH PACKAGED CONTROLS SHALL MAINTAIN DISCHARGE AIR TEMPERATURE (DAT) SETPOINT, SF VARIABLE AIR VOLUME CONTROL FROM DOWN-THE-DUCT STATIC PRESSURE SENSOR, MINIMUM OUTSIDE AIRFLOW CONTROL, MODULATE MIXING DAMPERS, GAS-FIRED HEATING CONTROLS, AND STAGE DX COOLING CONTROLS AS REQUIRED TO MAINTAIN PROPER DAT CONTROL; DEHUMIDIFICATION CONTROL FROM RETURN AIR HUMIDITY SENSOR AND HOT-GAS REHEAT COIL, PACKAGED DUAL ENTHALPY ECONOMIZER CONTROL TO PROVIDE FREE COOLING WHEN AVAILABLE, OPTIMUM START/STOP CONTROL BY BACNET POLLING THE TERMINAL UNIT TEMP SENSOR VALUES. WARM-UP DAT SHALL BE 72°F AND COOL-DOWN DAT SHALL BE 55°F. RTU-11 ONLY SHALL PROVIDE DCV CONTROL FROM CO2 SENSOR.
2. SF VFC SHALL BE MODULATED BY PACKAGED CONTROLS TO MAINTAIN REMOTE SYSTEM SUPPLY DUCT AIR STATIC PRESSURE SETPOINT THAT IS ADJUSTABLE FROM BAS THRU BACnet COMMUNICATION. EF SHALL REMAIN OFF FOR UNOCCUPIED CYCLING AND MORNING WARM-UP MODES OF OPERATION. VFC COMMON FAILURE ALARM FOR SUPPLY FAN AND EXHAUST FAN SHALL BE MONITORED BY DDC THRU AVAILABLE CONTACTS AT VFC'S. TAB CONTRACTOR SHALL DETERMINE APPROPRIATE DUCT STATIC PRESSURE SETPOINT. INITIAL VALUE SHALL BE 1.5" W.G.
3. PACKAGED CONTROLS SHALL MAINTAIN SUPPLY AIR STATIC PRESSURE SETPOINT THAT SHALL BE RESET BASED ON TU 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). STATIC DIFFERENTIAL PRESSURE HIGH LIMIT SWITCH SHALL PROVIDE HARDWIRED SAFETY AT 4.0" W.G.
4. EF VFC SHALL BE MODULATED TO MAINTAIN A CFM DIFFERENTIAL SETPOINT BETWEEN SUPPLY AIRFLOW AND RETURN AIRFLOW. REFER TO MECHANICAL SCHEDULES FOR SUPPLY AND RETURN AIRFLOW INFORMATION. FOR WARM-UP AND NIGHT CYCLE MODES (WHEN DAMPERS ARE IN NORMAL POSITION), THE CFM DIFFERENTIAL SHALL BE ZERO AND SUPPLY STATIC PRESSURE CONTROL SHALL BE LIMITED BY THE MAXIMUM RF AIRFLOW.
5. BACnet COMMUNICATION INTERFACE BY MFR. SHALL ALLOW UNIT OCCUPIED/UNOCCUPIED SCHEDULING & TEMPERATURE SETPOINTS, FAN STATUSES, DAT & DUCT STATIC PRESSURE SETPOINT ADJUSTMENT, AND ADDITIONAL UNIT MONITORING AS AVAILABLE, FROM THE BAS.
6. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE UNIT THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
7. TC CONTRACTOR PROVIDED SF DIFFERENTIAL PRESSURE SWITCH SHALL SHUT DOWN THE RTU IF DP INCREASES ABOVE DP SETPOINT. COORDINATE SETPOINT WITH THE UNIT MFR. REPRESENTATIVE.
8. RTU SHALL NIGHT CYCLE IN UNOCCUPIED MODE BASED ON POLLING THE AIR TERMINAL UNITS' TEMPERATURE SENSORS VIA BACNET COMMUNICATION. THE WARMEST SENSOR SHALL DETERMINE COOLING CONTROL AND THE COLDEST SENSOR SHALL DETERMINE HEATING CONTROL.
9. TC CONTRACTOR SHALL PROVIDE RTU COMMUNICATION INTERFACE WIRING TO NEW BAS NETWORK SUPERVISORY CONTROLLER, COMMUNICATING BUT NOT LIMITED TO THE FOLLOWING POINTS AS AVAILABLE:
   - OCCUPANCY MODE SCHEDULE (FROM BAS)
   - EFFECTIVE OCCUPANCY MODE (FROM BAS)
   - OCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
   - UNOCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
   - OCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
   - UNOCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
   - MINIMUM OUTSIDE AIR POSITION (FROM PACKAGED CONTROLLER)
   - SUPPLY FAN COMMAND STATUS (TO BAS)
   - SUPPLY FAN RUN STATUS (TO BAS)
   - SUPPLY FAN ALARM STATUS (TO BAS)
   - SUPPLY FAN VFC SPEED SETTING (TO BAS)
   - SUPPLY FAN VFC ALARM (TO BAS)
   - RETURN FAN COMMAND STATUS (TO BAS)
   - RETURN FAN RUN STATUS (TO BAS)
   - RETURN FAN ALARM STATUS (TO BAS)
   - RETURN FAN ECM SPEED SETTING (TO BAS)
   - OA DAMPER CFM SETTING (TO BAS)
   - RETURN FAN TRACKING OF OA DAMPER POSITION IN ECONOMIZER
   - DISCHARGE, OUTSIDE AIR, AND SPACE TEMPERATURE (TO BAS)
   - DEHUMIDIFICATION MODE STATUS (TO BAS)
   - HEATING/COOLING MODE STATUS (TO BAS)
   - GAS FIRED HEATING OUTPUT STATUS (TO BAS)
   - ECONOMIZER MODE STATUS (TO BAS)
   - COMPRESSOR ENABLE STATUS, EACH STAGE (TO BAS)
   - RTU-11 ONLY: DCV MODE STATUS (TO BAS)
   - DIRTY FILTER STATUS/ALARM (TO BAS)
   - MISC UNIT TEMPERATURE MONITORING (TO BAS)
   - TEMP SENSOR FAILURE ALARMS (TO BAS)
   - UNIT SAFETY CUTOUT ALARMS (TO BAS)
   - OTHER MISC ALARMS (TO BAS)



AIR TERMINAL UNIT CONTROL

TYPICAL FOR RTU AND AHU AIR HANDLING SYSTEM

NOTES:

1. REFER TO PIPING & SHEET METAL PLANS FOR LOCATIONS AND QUANTITY OF UNITS AND LOCATIONS OF ROOM TEMP SENSORS.
2. TERMINAL UNIT MANUFACTURER SHALL PROVIDE DAMPER AND VELOCITY SENSOR FOR SYSTEM CONTROL.
3. TC CONTRACTOR SHALL PROVIDE TU CONTROLLER, ROOM TEMP SENSOR, TU DISCHARGE AIR TEMP SENSOR, DAMPER ACTUATOR, RELATED CONTROL DEVICES, AND WIRING FOR CONTROLS INCLUDING 24VAC POWER AND DDC COMMUNICATION.
4. TC CONTRACTOR SHALL COORDINATE WITH TAB CONTRACTOR TO DETERMINE DAMPER CONTROL SETTINGS TO ACHIEVE SCHEDULED MINIMUM AND MAXIMUM CFMs.
5. TC CONTRACTOR SHALL FURNISH CONTROL VALVES FOR HEATING ELEMENTS PER THE MECHANICAL DETAILS. SELECT CONTROL VALVES TO ACHIEVE THE SCHEDULED FLOW RATES.

SEQUENCE OF OPERATION

TYP. FOR ROOF TOP UNITS WITH VAV AIR TERMINAL UNITS (TU):

1. ALL SETPOINTS INCLUDING RESET SCHEDULE SETPOINTS, TIME DELAYS, AND DEADBANDS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY BAS OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.
2. ROOMS WITH MULTIPLE TUs WITH A SINGLE ROOM TEMPERATURE SENSOR SHALL CONTROL IN UNISON.
3. VAV TUs DDC CONTROLLERS SHALL MODULATE THE TU DAMPER TO PROVIDE PRESSURE INDEPENDENT VAV MINIMUM AND MAXIMUM AIRFLOW SETTINGS AS INDICATED ON THE MECHANICAL SCHEDULES AND MODULATE THE HEATING CONTROL VALVE(S) BASED ON ROOM TEMPERATURE SENSOR AS DESCRIBED BELOW.
4. IN ALL MODES OF HEATING, TU DISCHARGE AIR TEMPERATURE SENSOR SHALL PROVIDE HIGH LIMIT SETPOINT CONTROL AT 90°F DAT.
5. WHEN ROOM TEMPERATURE RISES ABOVE THE COOLING SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL KEEP THE TEMPERING COIL AND PERIMETER (WHERE APPLICABLE) VALVE(S) CLOSED AND SHALL MODULATE THE SUPPLY AIRFLOW BETWEEN ITS MINIMUM AND MAXIMUM SETTINGS TO MAINTAIN ROOM TEMPERATURE SETPOINT.
6. FOR ZONES WITHOUT PERIMETER HEATING: WHEN ROOM TEMPERATURE 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 TOWARDS OPEN. IF THE ROOM TEMPERATURE 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 SETPOINT.
7. FOR ZONES WITH PERIMETER HEATING: WHEN OA TEMPERATURE IS 60°F OR BELOW AND ROOM TEMPERATURE 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 COMMAND THE PERIMETER HEATING CONTROL VALVE OPEN, FOLLOWED BY MODULATING THE TEMPERING COIL CONTROL VALVE (AFTER THE PERIMETER HEATING CONTROL VALVE IS FULL OPEN) TO MAINTAIN THE ROOM TEMPERATURE SETPOINT. IF THE ROOM TEMPERATURE 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 SETPOINT.
8. FOR ZONES WITH PERIMETER HEATING: WHEN OA TEMPERATURE IS ABOVE 60°F AND ROOM TEMPERATURE 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 ROOM TEMPERATURE 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 SETPOINT. PERIMETER HEATING CONTROL VALVE SHALL REMAIN CLOSED.
9. WHERE APPLICABLE: WHEN ZONE IS UNOCCUPIED DURING SCHEDULED OCCUPIED MODE AS DETERMINED BY MONITORING THE LIGHTING OCCUPANCY SENSOR AUX CONTACTS, DDC SHALL OPERATE AIR TERMINAL UNIT IN A TEMPORARY UNOCCUPIED MODE.
10. WHERE APPLICABLE:
    - 10.1. WHEN SPACE CARBON DIOXIDE LEVEL RISES ABOVE 1100 PPM SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL OVERRIDE AIRFLOW CONTROL AND MODULATE DAMPER MORE OPEN TO INCREASE SUPPLY AIRFLOW UNTIL CO2 SETPOINT IS SATISFIED. TU CONTROLLER SHALL MODULATE TEMPERING COIL VALVE TO MAINTAIN SPACE TEMP SETPOINT. NOTE: THERE IS NO REQUIREMENT TO INCREASE OUTSIDE AIRFLOW AT RELATED RTU IF CO2 LEVEL IS ABOVE SETPOINT WHEN TU DAMPER IS AT MAX POSITION.
    - 10.2. WHEN SPACE CARBON DIOXIDE LEVEL FALLS BELOW 600 PPM SETPOINT AFTER BEING IN VENTILATION OVERRIDE MODE, THE SUPPLY AIR TU CONTROLLER SHALL RETURN TO THE USUAL DAMPER CONTROL TO MAINTAIN SPACE TEMP SETPOINT.
11. ROOM TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:
    - HEATING UNOCCUPIED SETPOINT = 62°F
    - HEATING TEMPORARY UNOCCUPIED SETPOINT = 68°F
    - HEATING OCCUPIED SETPOINT = 70°F
    - COOLING OCCUPIED SETPOINT = 75°F
    - COOLING TEMPORARY UNOCCUPIED SETPOINT = 77°F
    - COOLING UNOCCUPIED SETPOINT = 80°F
12. DURING BUILDING UNOCCUPANCY, RELATED AHU OR RTU SHALL CYCLE AS REQUIRED TO MAINTAIN BUILDING SETBACK AND SETUP TEMPERATURE SETPOINTS.
13. WHEN RESPECTIVE AHU OR RTU IS DEACTIVATED, THE TERMINAL UNIT TEMPERING COIL CONTROL VALVE SHALL REMAIN CLOSED.
14. WHEN RESPECTIVE AHU OR RTU IS OPERATING IN WARM-UP OR PURGE MODES, THE TERMINAL UNIT SHALL MAINTAIN ITS MAXIMUM AIRFLOW SETTING UNTIL ROOM OCCUPIED TEMPERATURE SETPOINT IS ACHIEVED.
15. 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 OR RTU IS DEACTIVATED. IF AHU OR RTU OPERATES CONTINUOUSLY, THE RECALIBRATION AND RESET PROCESS SHALL BE STAGGERED AMONGST THE TERMINAL UNITS SO THE DUCT STATIC PRESSURE DOES NOT EXCEED LIMITS.
16. TERMINAL UNIT DISCHARGE AIR TEMPERATURE SHALL BE MONITORED FOR SYSTEM DIAGNOSTICS AND PROVIDE HIGH LIMIT CONTROL AS DESCRIBED.
17. CONTROL SIGNALS FOR AIR TERMINAL UNIT DAMPER ACTUATOR, TEMPERING COIL, AND PERIMETER HEATING CONTROL OUTPUTS SHALL BE DISPLAYED WITH BAS GRAPHICS.

TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M8.1 APPLY TO THIS DRAWING.

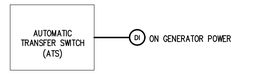
EMERGENCY GENERATOR MONITORING

NOTES:

1. DRY CONTACTS FOR REMOTE SYSTEM MONITORING SHALL BE PROVIDED WITH GENERATOR. COORDINATE WIRING REQUIREMENTS WITH SUPPLIER.
2. REFER TO ELECTRICAL DRAWINGS FOR LOCATION.

SEQUENCE OF OPERATION:

1. DDC SHALL MONITOR EMERGENCY GENERATOR FOR GENERAL ALARM AND TROUBLE STATUSES FOR BAS DISPLAY.



AUTOMATIC TRANSFER SWITCH MONITORING

TYPICAL FOR EACH ATS

NOTES:

1. DRY CONTACTS FOR REMOTE SYSTEM MONITORING SHALL BE PROVIDED WITH THE TRANSFER SWITCH. COORDINATE WIRING REQUIREMENTS WITH SUPPLIER.
2. REFER TO ELECTRICAL DRAWINGS FOR LOCATION.

SEQUENCE OF OPERATION:

1. DDC SHALL MONITOR EACH ATS FOR "ON GENERATOR POWER" STATUS FOR BAS DISPLAY.

CW BOOSTER BP-1 ALARM MONITORING

NOTES:

1. REFER TO FLOOR PLANS FOR LOCATION.
2. DRY CONTACT FOR REMOTE SYSTEM MONITORING SHALL BE PROVIDED WITH CITY WATER BOOSTER SYSTEM CONTROL PANEL. COORDINATE WIRING REQUIREMENTS WITH SYSTEM SUPPLIER.

SEQUENCE OF OPERATION

SEQUENCE OF OPERATION

DDC SHALL MONITOR CITY WATER BOOSTER SYSTEM COMMON ALARM FOR BAS DISPLAY.

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PBA Project No: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

05-27-2020	FOR CONSTRUCTION - BID PACK #3
05-01-2020	95% REVIEW - BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DATE: ISSUED FOR:

DRAWN DJT

CHECKED SVM

APPROVED RNR

PROJECT NO.

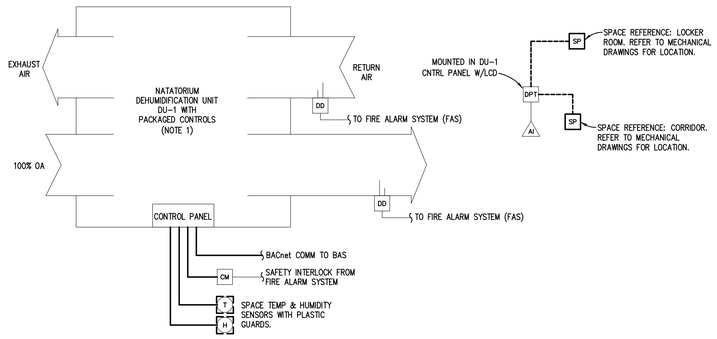
19040

DRAWING NO.

M8.4-BP3

TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M8.1 APPLY TO THIS DRAWING.



NATATORIUM DU-1 CONTROL

NOTES:

1. NATATORIUM (NAT) DEHUMIDIFICATION UNIT SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS FROM MANUFACTURER INCLUDING DDC CONTROLLER, BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, SPACE AND HUMIDITY SETPOINT ADJUSTMENT AND UNIT MONITORING.
2. SINGLE POINT POWER SUPPLY CONNECTION SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR. TC CONTRACTOR SHALL INSTALL SPACE TEMPERATURE AND HUMIDITY SENSORS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARDS FOR SPACE SENSORS. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE. TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO DEHUMIDIFICATION UNIT SAFETY CUTOUT CIRCUIT.
4. TC CONTRACTOR SHALL MOUNT STATIC REFERENCE PROBES AS SHOWN ON DRAWINGS AND PROVIDE INSTRUMENT AIR TUBING TO THE STATIC PRESSURE TRANSMITTER PROVIDED BY THE UNIT MANUFACTURER AND LOCATED IN THE UNIT CONTROLS PANEL.
5. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM DU-1 CONTROL PANEL TO NEW BAS NETWORK SUPERVISORY CONTROLLER.
6. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
7. RTU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR DU START-UP, PROGRAMMING OF DU, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.

SEQUENCE OF OPERATION:

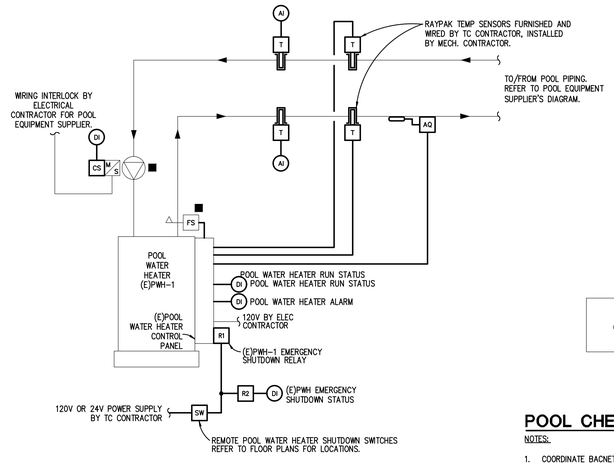
NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. DEHUMIDIFICATION UNIT WITH PACKAGED CONTROLS SHALL MAINTAIN NAT SPACE TEMPERATURE AND HUMIDITY SETPOINTS WITH MANUFACTURER'S SEQUENCE OF OPERATION. PACKAGED CONTROLS SHALL PROVIDE POINTS AS AVAILABLE AND SHOWN IN INTEGRATION POINTS CHART.
2. DEHUMIDIFICATION UNIT WITH PACKAGED CONTROLS FOR CONSTANT VOLUME AIRFLOW AND SUMMER/WINTER OUTSIDE AIRFLOW CONTROL.
3. DEHUMIDIFICATION UNIT WITH PACKAGED CONTROLS SHALL MAINTAIN NAT SPACE SLIGHTLY NEGATIVE WITH RESPECTIVE TO CORRIDOR VIA SUPPLY/EXHAUST FAN VFC CONTROL FROM SPACE STATIC PRESSURE DPT. STATIC SETPOINT TO BE DETERMINED BY TAB CONTRACTOR'S FINAL BALANCE REPORT. REFER TO MECHANICAL DRAWINGS FOR STATIC REFERENCE SENSORS.
4. BACnet OPEN PROTOCOL COMMUNICATIONS INTERFACE SHALL BE PROVIDED WITH PACKAGED CONTROLS AND CONNECTED TO OWNER'S BUILDING AUTOMATION SYSTEM. UNIT SHALL OPERATE 24/7 UNLESS COMMANDED OFF FROM THE BAS OR UNIT SAFETY HAS SHUTDOWN THE UNIT.
5. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE DEHUMIDIFICATION UNIT THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
6. NAT TEMPERATURE SETPOINT SHALL BE 2°F WARMER THAN THE POOL WATER TEMPERATURE SETPOINT.
7. NAT HUMIDITY SETPOINTS SHALL BE 53% RH FOR WINTER AND 58% RH FOR SUMMER.

BACNET MS/TP PROTOCOL TO BAS, INTEGRATION POINTS AS FOLLOWS (BUT NOT LIMITED TO):

DU-1 CONTROL PANEL (UNIT MOUNTED)

- OCCUPANCY MODE SCHEDULE (FROM BAS)
- EFFECTIVE OCCUPANCY MODE (TO BAS)
- OCCUPIED HEATING SPACE TEMP SETPOINT (FROM BAS)
- EFFECTIVE HEATING ENABLE SETPOINT
- OCCUPIED COOLING SPACE TEMP SETPOINT (FROM BAS)
- EFFECTIVE COOLING ENABLE SETPOINT
- DU ENABLED/DISABLED STATUS (TO BAS)
- DU SF ON/OFF STATUS (TO BAS)
- DU EF ON/OFF STATUS (TO BAS)
- SUPPLY FAN RUN STATUS/ALARM (TO BAS)
- EXHAUST FAN RUN STATUS/ALARM (TO BAS)
- GAS-FIRED HEATING STAGE/MODULATION OUTPUT STATUS (TO BAS)
- COMPRESSOR ENABLE STATUS (TO BAS)
- COMPRESSOR FAILURE ALARMS (TO BAS)
- NUMBER OF COOLING STAGES ACTIVATED (TO BAS)
- HX LEAVING (EXHAUST) AIR TEMPERATURE (TO BAS)
- DEFROST MODE STATUS (TO BAS)
- HOT GAS REHEAT STATUS (TO BAS)
- SPACE TEMP (TO BAS)
- SPACE RELATIVE HUMIDITY (TO BAS)
- DISCHARGE AIR TEMP (TO BAS)
- RETURN AIR TEMP (TO BAS)
- RETURN AIR HUMIDITY (TO BAS)
- OUTSIDE AIR TEMP (FROM BAS)
- OUTSIDE AIR HUMIDITY (FROM BAS)
- GENERAL ALARM (TO BAS)
- DIRTY FILTERS ALARMS (TO BAS)
- TEMP SENSOR FAILURE ALARMS (TO BAS)
- BUILDING STATIC PRESSURE (TO BAS)
- PROVIDE UP TO 15 ADDITIONAL POINTS. COORDINATE WITH OWNER STAFF. (TO BAS)



(E)POOL WATER HEATING SYSTEM CONTROL

(E)POOL WATER HEATER IS EXISTING AND HAS BEEN RELOCATED.

NOTES:

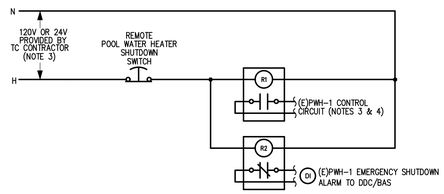
1. ■ INDICATED COMPONENT IS EXISTING BY (E)POOL WATER HEATER SUPPLIER. TC CONTRACTOR SHALL PROVIDE CONTROL WIRING.
2. COORDINATE ALL WIRING AND TERMINATIONS WITH (E)POOL WATER HEATER SUPPLIER.
3. COORDINATE ALL (E)POOL WATER HEATER WORK WITH TRADES.
4. FURNISH TWO NEW RAYPAK TEMPERATURE SENSORS IN THERMOWELLS FOR MECHANICAL CONTRACTOR INSTALLATION. WIRE SENSORS TO (E)RAYPAK CONTROLLER. COORDINATE WITH RE-STARTUP OF (E)RAYPAK BOILER FOR SEQUENCE OF OPERATION HEREIN.
5. TC CONTRACTOR SHALL PROVIDE (E)POOL WATER HEATER EMERGENCY SHUTDOWN COMPONENTS AND WIRING. REFER TO REMOTE (E)POOL WATER HEATER SHUTDOWN WIRING DIAGRAM.

SEQUENCE OF OPERATION

(E)POOL HEATING SYSTEM:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. (E)PWH SHALL RUN CONTINUOUSLY. (E)FLOW SWITCH SHALL MAKE WHEN (E)POOL CIRC PUMP IS ACTIVATED (BY OTHERS).
2. (E)PWH CONTROL PANEL SHALL ACTIVATE OR DEACTIVATE (E)PWH BURNER STAGES AS REQUIRED TO MAINTAIN POOL WATER RETURN TEMP SETPOINT OF 80°F (ADJUSTABLE AT PANEL ONLY).
3. (E)PWH CONTROL PANEL SHALL LIMIT THE POOL SUPPLY WATER TEMPERATURE TO A HIGH LIMIT OF 110°F (ADJUSTABLE AT PANEL ONLY).
4. DDC SHALL MONITOR (E)PWH RUN STATUS, ALARM, AND POOL SUPPLY AND RETURN WATER TEMPERATURES.
5. WHEN ONE OF THE REMOTE POOL WATER HEATER SHUTDOWN SWITCHES IS PUSHED, BURNER CONTROLS FOR (E)PWH SHALL BE DE-ENERGIZED THRU HARDWIRE INTERLOCK.
6. AQUASTAT WITH AUTOMATIC RESET FEATURE SHALL PROVIDE HIGH LIMIT OVERRIDE "OFF" CONTROL OF (E)PWH IF POOL WATER SUPPLY TEMPERATURE EXCEEDS 115°F. AQUASTAT SETPOINT IS ADJUSTABLE AT THE DEVICE.
7. DDC SHALL MONITOR (E)POOL CIRC PUMP AND PROVIDE MOTOR RUN TIME HOURS OF OPERATION FOR BAS DISPLAY. IF DDC SENSES PUMP IS OFF, DDC SHALL PROVIDE AN ALARM TO THE BAS.



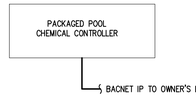
(E)POOL WATER HEATER EMERGENCY SHUTDOWN WIRING

NOTES:

1. LOCATE SWITCH AT EACH ENTRANCE TO THE (E)POOL WATER HEATER MECHANICAL ROOM. REFER TO FLOOR PLANS FOR ENTRY LOCATIONS AND FIELD VERIFY INSTALLATION REQUIREMENTS.
2. TC CONTRACTOR SHALL PROVIDE SIGN (NAME PLATE) TO BE PLACED DIRECTLY ABOVE OR BELOW EACH PUSHBUTTON SWITCH THAT READS: "EMERGENCY POOL WATER HEATER SHUTDOWN". COORDINATE LOCATION WITH OTHER TRADES.
3. TC CONTRACTOR SHALL SUPPLY POWER TO EMERGENCY SHUTDOWN CIRCUIT PUSHBUTTONS AND CONTROL RELAYS. COORDINATE WITH ELECTRICAL CONTRACTOR AS NECESSARY.
4. TC CONTRACTOR SHALL WIRE (E)POOL WATER HEATERS' CONTROL CIRCUITS (POWER FROM SECONDARY SIDE OF CONTROL TRANSFORMERS) THRU NORMALLY OPEN RELAY CONTACTS. TC CONTRACTOR SHALL COORDINATE EXACT WIRING AND TERMINATION REQUIREMENTS WITH (E)POOL WATER HEATER MANUFACTURER.
5. TC CONTRACTOR SHALL MOUNT SHUTDOWN CONTROL RELAYS AT RESPECTIVE (E)POOL WATER HEATER CONTROL PANEL.
6. TC CONTRACTOR SHALL PROVIDE PUSHBUTTON SWITCH (PUSH TO LATCH – TURN KEY TO RELEASE) WITH MUSHROOM HEAD OPERATOR, FLIP-UP PLASTIC GUARD, AND NORMALLY CLOSED (NC) CONTACTS. PROVIDE WITH PROPER ENCLOSURE.

SEQUENCE OF OPERATION:

1. UNDER NORMAL OPERATING CONDITIONS THE CIRCUIT SHALL BE ENERGIZED AND THE RELAY'S NORMALLY OPEN (NO) CONTACTS SHALL BE CLOSED. WHEN A SWITCH IS PUSHED (LATCHED) THE RELAY CONTACTS SHALL OPEN AND INTERRUPT THE (E)POOL WATER HEATER'S CONTROL CIRCUIT. WHEN THE KEY IS TURNED TO RELEASE THE SWITCH, THE RELAY SHALL BE ENERGIZED AND ITS NORMALLY OPEN CONTACTS SHALL CLOSE, ENERGIZING THE (E)POOL WATER HEATER'S CONTROL CIRCUIT.
2. DDC SHALL ACTIVATE AN ALARM WHEN A REMOTE SWITCH HAS BEEN PUSHED.



POOL CHEMICAL CONTROLLER

NOTES:

1. COORDINATE BACNET IP CONNECTION FROM OWNER'S LAN WITH OWNER'S IT STAFF.
2. COORDINATE BACNET POINTS WITH POOL EQUIPMENT SUPPLIER AND PROVIDE INTEGRATION POINTS ON OWNER'S BAS GRAPHICS.

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PBA Project No: 2019-0237

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CHECKED SVM
APPROVED RNR

PROJECT NO.

19040

DRAWING NO.

M8.5-BP3

TC GENERAL NOTES

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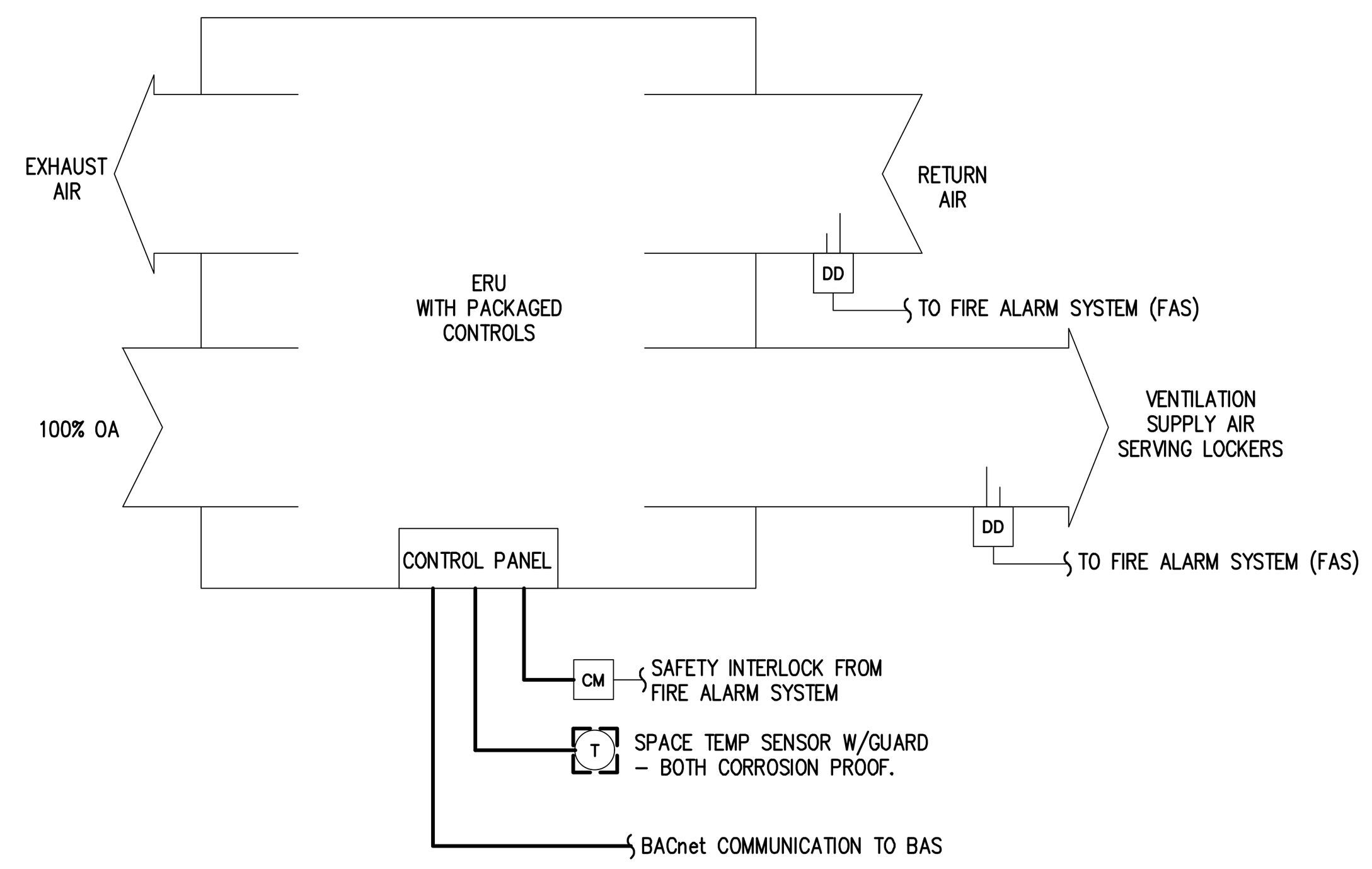


ERU-1 CONTROL PANEL (UNIT MOUNTED)

BACNET MS/TP PROTOCOL TO BAS, INTEGRATION POINTS AS FOLLOWS (BUT NOT LIMITED TO):

- OCCUPANCY MODE SCHEDULE (FROM BAS)
- SF ON/OFF STATUS AND ALARM (TO BAS)
- EF ON/OFF STATUS AND ALARM (TO BAS)
- EFFECTIVE OCCUPIED MODE (TO BAS)
- GENERAL ALARM (TO BAS)
- EXHAUST AIR DIRTY FILTER ALARM (TO BAS)
- OUTSIDE AIR DIRTY FILTER ALARM (TO BAS)
- DISCHARGE AIR LOW-LIMIT ALARM (TO BAS)
- SAFETY CUT-OUT ALARM (TO BAS)
- OCCUPIED MODE ZONE HEATING SETPOINT (TO BAS)
- UNOCCUPIED MODE ZONE HEATING SETPOINT (TO BAS)
- DISCHARGE AIR TEMPERATURE (TO BAS)
- OUTSIDE AIR TEMPERATURE (FROM BACnet)
- OUTSIDE AIR HUMIDITY (FROM BACnet)
- PLATE HX ENTERING EXHAUST AIR TEMPERATURE (TO BAS)
- PLATE HX LEAVING EXHAUST AIR TEMPERATURE (TO BAS)
- PLATE HX SEQUENCING DAMPER POSITION (TO BAS)
- HX BYPASS DAMPER CONTROL OUTPUT % (TO BAS)
- HEATING CONTROL OUTPUT % (TO BAS)
- ECONOMIZER MODE ACTIVE STATUS (TO BAS)

LOCKER ROOM ERU-1 CONTROL

NOTES:

1. LOCKER ROOM ENERGY RECOVERY UNIT (ERU) SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS FROM MANUFACTURER INCLUDING DDC CONTROLLER, BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, SPACE AND HUMIDITY SETPOINT ADJUSTMENT AND UNIT MONITORING.
2. SINGLE POINT POWER SUPPLY CONNECTION SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR. TC CONTRACTOR SHALL INSTALL SPACE TEMPERATURE AND HUMIDITY SENSORS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARDS FOR SPACE SENSORS. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE. TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO DEHUMIDIFICATION UNIT SAFETY CUTOUT CIRCUIT.
4. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM ERU-1 CONTROL PANEL TO NEW BAS NETWORK SUPERVISORY CONTROLLER.
6. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
7. ERU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR ERU START-UP, PROGRAMMING OF RTU, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.

SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. ERU WITH PACKAGED CONTROLS FOR CONSTANT VOLUME AIRFLOW AND PROVIDES SLIGHT NEGATIVE PRESSURE BETWEEN THE LOCKER ROOM AND CORRIDOR VIA TAB CONTRACTOR'S FINAL BALANCE SETTINGS FOR SUPPLY/RETURN AIRFLOWS.
2. ERU SHALL MAINTAIN OCCUPIED/UNOCCUPIED SPACE TEMPERATURE SETPOINTS FROM BAS BUILDING OCCUPANCY SCHEDULE.
3. BACnet OPEN PROTOCOL COMMUNICATIONS INTERFACE SHALL BE PROVIDED WITH PACKAGED CONTROLS AND CONNECTED TO OWNER'S BUILDING AUTOMATION SYSTEM THAT SHALL ALLOW UNIT SCHEDULING, FAN STATUSES, TEMPERATURE ADJUSTMENT, AND ADDITIONAL UNIT MONITORING AS AVAILABLE.
4. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE ERU THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
5. SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:

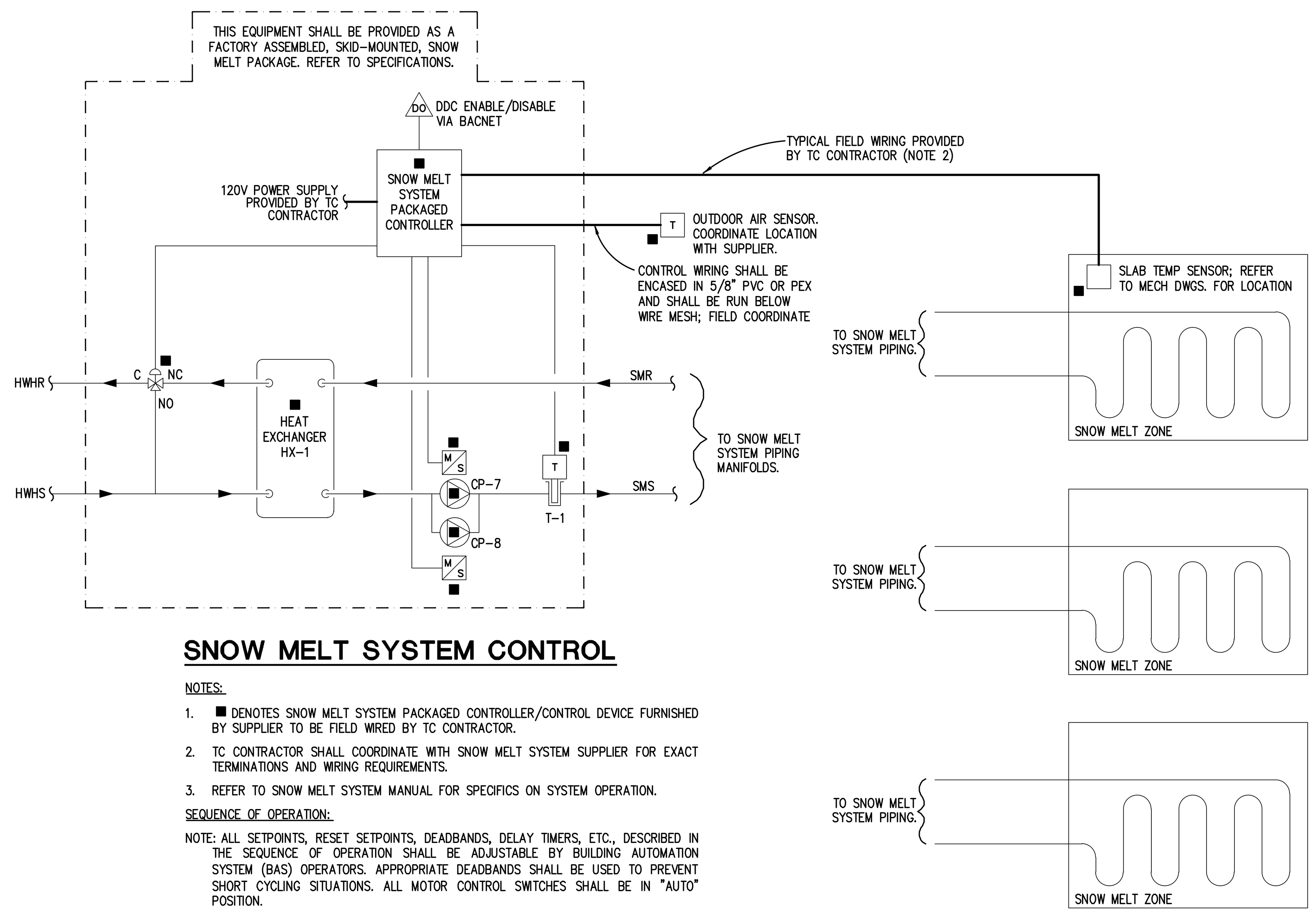
   HEATING UNOCCUPIED SETPOINT = 62°F

   HEATING OCCUPIED SETPOINT = 72°F

SNOW MELT SYSTEM PACKAGED CONTROLLER

BACNET MS/TP PROTOCOL TO BAS, INTEGRATION POINTS AS FOLLOWS (BUT NOT LIMITED TO):

- SNOW MELT ENABLE/DISABLE (FROM BAS)
- SNOW MELT OPERATING STATUS (TO BAS)
- OUTSIDE SENSOR INDICATION (TO BAS)
- SLAB 1, 2, & 3 TEMPERATURES (TO BAS)
- MELT TIME REMAINING (TO BAS)
- SYSTEM PUMP 1 RUN TIME (TO BAS)
- SYSTEM PUMP 2 RUN TIME (TO BAS)
- SYSTEM PUMP 1/2 ON/OFF/ALARM STATUS (TO BAS)
- SYSTEM PUMP LEAD/LAG STATUS (TO BAS)
- SYSTEM SUPPLY WATER TEMPERATURE (TO BAS)
- SYSTEM RETURN WATER TEMPERATURE (TO BAS)
- CONTROL VALVE OUTPUT % (TO BAS)
- 10 ADDITIONAL POINTS (TO BAS)



SNOW MELT SYSTEM CONTROL

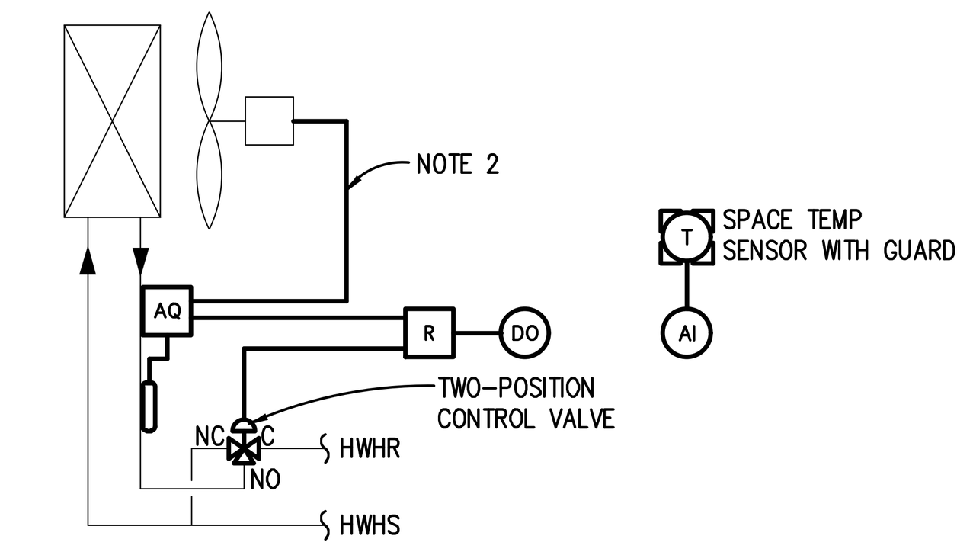
NOTES:

1. ■ DENOTES SNOW MELT SYSTEM PACKAGED CONTROLLER/CONTROL DEVICE FURNISHED BY SUPPLIER TO BE FIELD WIRED BY TC CONTRACTOR.
2. TC CONTRACTOR SHALL COORDINATE WITH SNOW MELT SYSTEM SUPPLIER FOR EXACT TERMINATIONS AND WIRING REQUIREMENTS.
3. REFER TO SNOW MELT SYSTEM MANUAL FOR SPECIFICS ON SYSTEM OPERATION.

SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. DDC SHALL ENABLE THE SNOW MELT SYSTEM PACKAGED CONTROLLER WHEN OUTDOOR AIR TEMP IS BELOW 37°F (ADJ.). DURING THIS TIME THE SYSTEM WILL IDLE UNTIL SUCH TIME THAT MOISTURE IS SENSED BY THE OUTSIDE SENSOR.
2. WHEN MOISTURE IS DETECTED, THE SYSTEM WILL BECOME ACTIVE AND BE CONTROLLED TO MAINTAIN A SPECIFIC SLAB TEMPERATURE. THE PACKAGED CONTROLLER SHALL MODULATE THE MIXING VALVE AND CYCLE THE GLYCOL PUMP AS REQUIRED. EACH ZONE HAS A SLAB TEMPERATURE SENSOR.
3. DDC SYSTEM SHALL MONITOR PUMPS FOR RUNTIME HOURS OF OPERATION..
4. DDC SYSTEM SHALL MONITOR SUPPLY AND RETURN WATER TEMPERATURES FOR DIAGNOSTIC PURPOSES.



HWH UH/CUH CONTROL

TYPICAL

NOTES:

1. REFER TO MECHANICAL DRAWINGS FOR QUANTITY AND LOCATION OF UNITS.
2. AQUASTAT SHALL BE WIRED IN SERIES WITH FAN CONTROL WIRING CIRCUIT.

SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS, RESET SCHEDULE SETPOINTS, DEADBANDS, AND TIME INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY BAS OPERATORS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. ASHRAE 90.1-2013 FOR VESTIBULES ONLY:

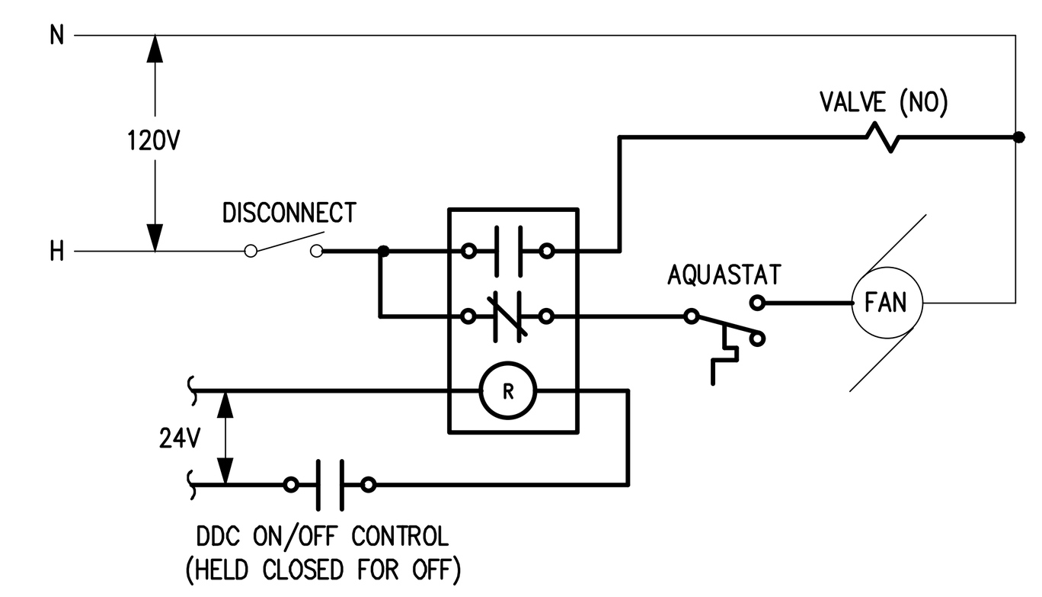
1.1. DDC SHALL ENABLE/DISABLE UH/CUH FAN CIRCUIT AND OPEN/CLOSE HEATING VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 60°F. FAN SHALL ACTIVATE UPON PROOF OF HWHR FLOW BY AQUASTAT. AQUASTAT SHALL PROVIDE 4°F DEADBAND FOR CONTROL. DDC SHALL PROVIDE 2°F DEADBAND FOR CONTROL.

1.2. WHEN OUTSIDE AIR TEMPERATURE INCREASES ABOVE 45°F, DDC SHALL DISABLE CONTROL OF THE UH/CUH.

2. FOR ALL OTHER AREAS/ROOMS:

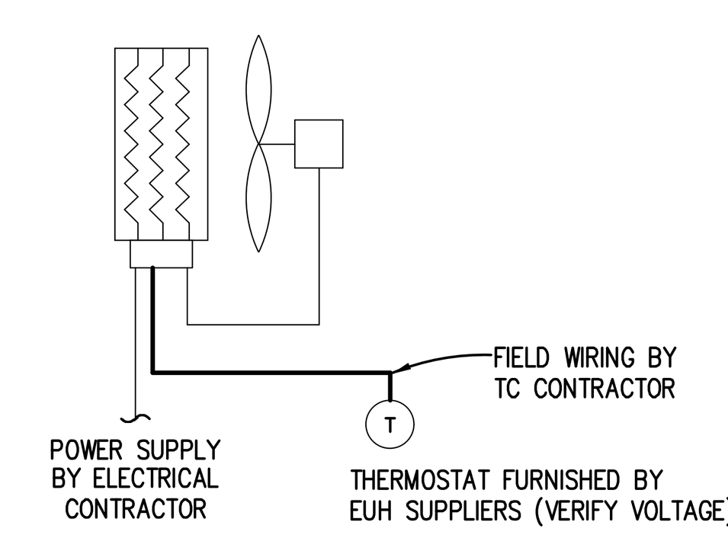
2.1. DDC SHALL ENABLE/DISABLE UH/CUH FAN CIRCUIT AND OPEN/CLOSE HEATING VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 68°F DURING BUILDING OCCUPIED MODE AND 50°F DURING BUILDING UNOCCUPIED MODE. UH/CUH FAN SHALL ACTIVATE UPON PROOF OF HWHR FLOW BY AQUASTAT. AQUASTAT SHALL PROVIDE 4°F DEADBAND FOR CONTROL. DDC SHALL PROVIDE 2°F DEADBAND CONTROL AROUND SETPOINTS.

2.2. WHEN OUTSIDE AIR TEMPERATURE INCREASES ABOVE 60°F, DDC SHALL DISABLE CONTROL OF THE UH/CUH.



HWH UH & CUH WIRING

TYPICAL



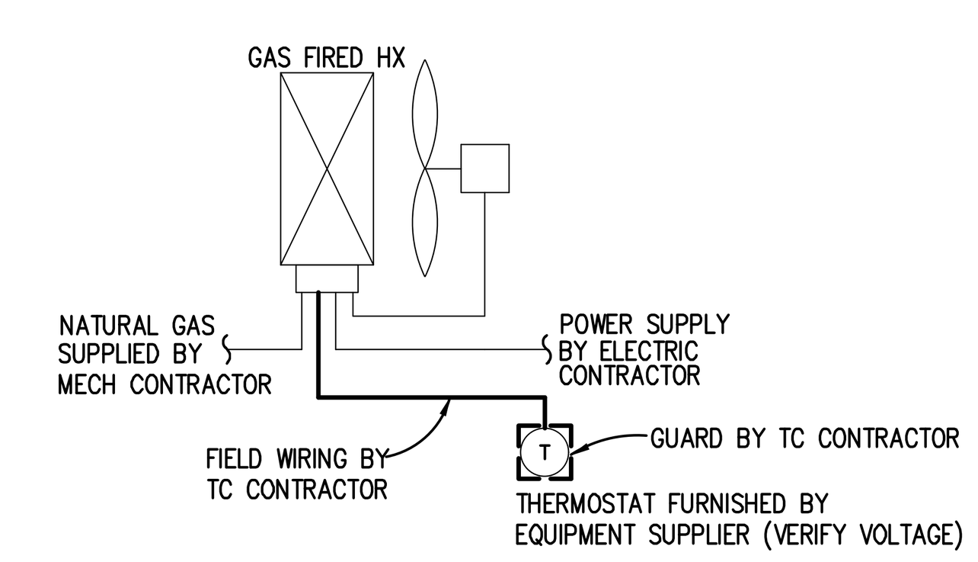
TYPICAL EUH CONTROL

NOTE:

1. REFER TO MECHANICAL DRAWINGS FOR QUANTITY AND LOCATION OF UNITS.
2. THERMOSTAT MAY BE 1-STAGE OR 2-STAGE, COORDINATE WIRING REQUIREMENTS WITH THE EQUIPMENT SUPPLIER.

SEQUENCE OF OPERATION:

1. SPACE THERMOSTAT SHALL ENERGIZE ELECTRIC UNIT HEATER CONTROL CIRCUIT TO MAINTAIN SPACE TEMPERATURE SETPOINT. INITIAL SETPOINT SHALL BE 68°F.



TYPICAL GAS FIRED UNIT HEATER (GUH)

NOTE:

1. REFER TO MECHANICAL DRAWINGS FOR QUANTITY AND LOCATION OF UNITS.
2. THERMOSTAT MAY BE 1-STAGE OR 2-STAGE, COORDINATE WIRING REQUIREMENTS WITH THE EQUIPMENT SUPPLIER.

SEQUENCE OF OPERATION:

1. SPACE THERMOSTAT SHALL ENERGIZE GAS FIRED UNIT HEATER CONTROL CIRCUIT TO MAINTAIN SPACE TEMPERATURE SETPOINT. INITIAL SETPOINT SHALL BE 68°F.

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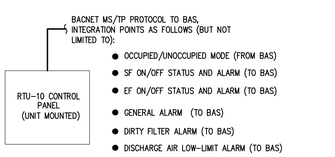
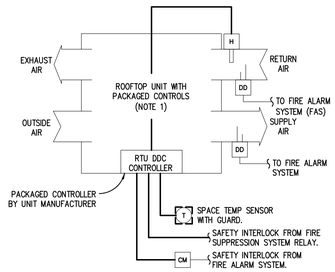
M8.6-BP3





RTU-10 CAV CONTROL

RTU-10 SERVES KITCHEN

NOTES:

1. KITCHEN ROOF TOP UNIT (RTU) SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS FROM MANUFACTURER INCLUDING DDC CONTROLLER, BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, SPACE AND HUMIDITY SETPOINT ADJUSTMENT AND UNIT MONITORING.
2. SINGLE POINT POWER SUPPLY CONNECTION SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR. TC CONTRACTOR SHALL INSTALL SPACE TEMPERATURE AND HUMIDITY SENSORS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARDS FOR SPACE SENSORS. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE. TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO DEHUMIDIFICATION UNIT SAFETY CUTOUT CIRCUIT.
4. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM RTU CONTROL PANEL TO NEW BAS NETWORK SUPERVISORY CONTROLLER. TC CONTRACTOR SHALL PROVIDE FIELD WIRING FOR CONTROLS AS INDICATED AND REQUIRED FOR PACKAGED UNIT TEMPERATURE CONTROLS.
5. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
6. RTU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR RTU START-UP, PROGRAMMING OF RTU, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.
7. TC CONTRACTOR SHALL PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN.

SEQUENCE OF OPERATION

GYM RTU SEQUENCE OF OPERATION:

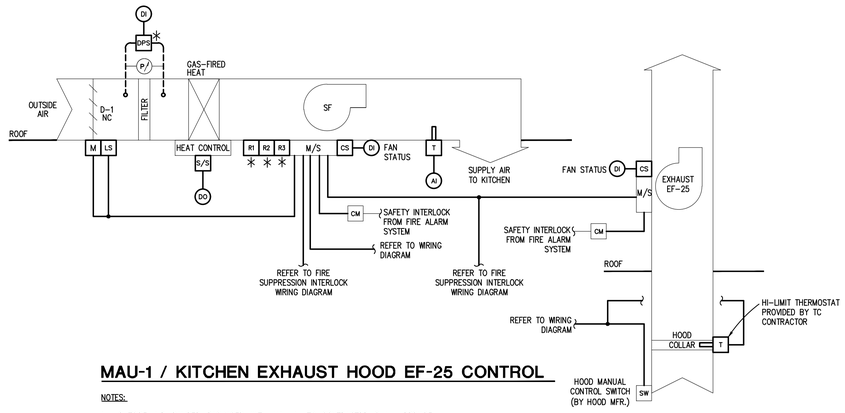
NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. RTU WITH PACKAGED CONTROLS SHALL MAINTAIN GYM SPACE TEMPERATURE AND RETURN AIR HUMIDITY SETPOINTS WITH MANUFACTURER'S SEQUENCE OF OPERATION. BAS SHALL PROVIDE OCCUPIED HOURS OF OPERATION, OCCUPIED/UNOCCUPIED HEATING/COOLING SETPOINTS, MINIMUM OUTSIDE AIRFLOW, AND UNIT MONITORING.
2. RTU WITH PACKAGED CONTROLS SHALL PROVIDE DEHUMIDIFICATION CONTROL BASED ON RETURN AIR HUMIDITY SENSOR, FREE COOLING ECONOMIZER BASED ON DUAL ENTHALPY COMPARISON, HEATING & COOLING CONTROL TO PROVIDE SPACE TEMPERATURE RESET OF DISCHARGE AIR TEMPERATURE (CASCADE CONTROL). DAT SHALL NOT EXCEED 100°F FOR HEATING OR DECREASE BELOW 55°F FOR COOLING.
3. RTU PACKAGED CONTROLS SHALL OPERATE RTU FAN(S) CONTINUOUSLY IN OCCUPIED MODE, AND NIGHT CYCLE FAN(S) IN UNOCCUPIED MODE
4. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE RTU THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
5. SPACE TEMP SETPOINTS SHALL BE:

UNOCCUPIED HEATING SETPOINT:	62°F (ADJUSTABLE)
OCCUPIED HEATING SETPOINT:	70°F (ADJUSTABLE)
OCCUPIED COOLING SETPOINT:	74°F (ADJUSTABLE)
UNOCCUPIED COOLING SETPOINT:	82°F (ADJUSTABLE)

6. PACKAGED RTU UNIT CONTROLLER WITH LCD AND USER MENUS PROVIDES THE FOLLOWING (BUT NOT LIMITED TO) POINTS AS AVAILABLE:

- OCCUPANCY MODE SCHEDULER
- EFFECTIVE OCCUPANCY MODE
- SUPPLY FAN RUN STATUS
- OCCUPIED SPACE HEATING TEMP SETPOINT
- UNOCCUPIED SPACE HEATING TEMP SETPOINT
- OCCUPIED SPACE COOLING TEMP SETPOINT
- UNOCCUPIED SPACE COOLING TEMP SETPOINT
- DISCHARGE, OUTSIDE AIR, AND SPACE TEMPERATURE
- HEATING MODE STATUS
- HEATING OUTPUT STATUS
- "FREE COOLING" ECONOMIZER MODE STATUS
- DEHUMIDIFICATION CONTROL THRU HOT GAS REHEAT CONTROL
- DIRTY FILTER STATUS/ALARM
- MISC UNIT TEMPERATURE MONITORING
- SENSOR FAILURE ALARMS
- UNIT SAFETY CUTOUT ALARMS
- OTHER MISC ALARMS



MAU-1 / KITCHEN EXHAUST HOOD EF-25 CONTROL

NOTES:

1. OUTSIDE AIR DAMPER PACKAGED WITH MAU-1. TC CONTRACTOR SHALL PROVIDE DAMPER ACTUATOR(S).
2. TC CONTRACTOR SHALL COORDINATE WIRING AND TERMINATION REQUIREMENTS WITH SUPPLIER.
3. TC CONTRACTOR SHALL PROVIDE WIRING FROM FIRE SUPPRESSION SYSTEM CONTACT TO MOTOR STARTER CONTROL CIRCUIT. COORDINATE WIRING AND TERMINATION REQUIREMENTS WITH SUPPLIER.
4. TC CONTRACTOR SHALL PROVIDE BACNET CONTROLLER FOR THE DDC POINTS SHOWN ABOVE.
5. ✳ INDICATES PANEL MOUNTED COMPONENT. COORDINATE PANEL LOCATION WITH ARCHITECT.
6. TC CONTRACTOR SHALL SET FILTER DPS BASED ON FILTER MANUFACTURER'S LOADED FILTER DATA.

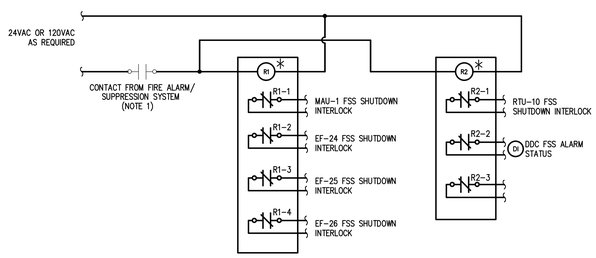
SEQUENCE OF OPERATION

NOTES: ALL SETPOINTS, DELAYS, AND DEADBANDS DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BAS OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION. "HAND" POSITION FOR BOTH FANS ARE FOR MAINTENANCE ONLY. FIRE SUPPRESSION SYSTEM, WHEN ACTIVATED, SHALL PREVENT BOTH FANS FROM RUNNING IN "AUTO" OR "HAND."

1. KITCHEN HOOD EXHAUST FAN EF-25 AND KITCHEN MAKE-UP AIR UNIT (MAU-1) SF ARE ACTIVATED BY KITCHEN HOOD LOCAL CONTROL SWITCH OR HOOD HIGH-LIMIT THERMOSTAT. THERMOSTAT SHALL BE SET FOR 85°F (ADJUSTABLE AT THERMOSTAT).
2. WHEN EITHER THE KITCHEN HOOD LOCAL CONTROL SWITCH OR HOOD HIGH-LIMIT THERMOSTAT ARE ACTIVATED, AND FIRE ALARM AND FIRE SUPPRESSION SAFETIES ARE MADE, MAU-1 OA DAMPER SHALL OPEN AND INTERLOCK WIRING FROM OA DAMPER LIMIT SWITCH SHALL ENABLE MAU-1 SF IN THE "AUTO" CIRCUIT ONLY. MAU-1 SF AUX CONTACT SHALL ENABLE EF-25 TO RUN IF FIRE ALARM AND FIRE SUPPRESSION SAFETIES ARE MADE.
3. MAU-1 SF AND EF-25 FAN STATUSES IS MONITORED BY DDC THROUGH RESPECTIVE CURRENT SWITCHES. DDC SHALL MONITOR HOOD OPERATION STATUS, IF "ON" AND MAU-1 SF AND EF-25 STATUSES ARE NOT "ON" IN 120 SECONDS, DDC SHALL PROVIDE AN ABNORMAL ALARM AT BAS. DDC SHALL TOTALIZE RUN TIME HOURS FOR BOTH FANS FOR BAS DISPLAY.
4. WHEN MAU-1 SF IS ACTIVATED AS SENSED BY CURRENT SWITCH, DDC SHALL CONTROL GAS-FIRED HEATING CONTROL TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT OF 70°F. WHEN MAU-1 SF STATUS IS SENSED AS "ON", AND AFTER A 120 SECOND (ADJUSTABLE) DELAY, MAU-1 SF AND EF-25 STATUS IS NOT "ON", CONTROLLER SHALL PROVIDE AN ALARM. ALARM SHALL RETURN TO NORMAL WHEN BOTH STATUSES ARE NORMAL.
5. WHEN THE FIRE SUPPRESSION SYSTEM IS ACTIVATED, MAU-1 SF, EF-25, GENERAL EXHAUST FAN EF-X, RTU-10, AND DISHWASHER FAN EF-Y SHALL BE DEACTIVATED REGARDLESS OF HOOD SWITCH POSITION OR HOOD HIGH-LIMIT THERMOSTAT. WHEN FIRE SUPPRESSION SYSTEM IS ACTIVATED, DDC SHALL PROVIDE AN ALARM TO THE BAS.
6. WHEN KITCHEN HOOD SWITCH IS DEACTIVATED BY MANUAL SWITCH AND HOOD HIGH LIMIT THERMOSTAT SENSES HOOD TEMP LESS THAN SETPOINT, MAU-1 AND EF-25 SHALL BE DEACTIVATED. MAU-1 OUTSIDE AIR DAMPER CLOSES AND GAS-FIRED HEATING CONTROLS ARE DISABLED, SF TURNS OFF, AND EF-25 TURNS OFF.
7. DDC SHALL PROVIDE AN ALARM IF MAU-1 DAT IS LESS THAN 45°F OR GREATER THAN 100°F.
8. FILTER STATUS SHALL BE MONITORED BY DDC THRU DIFFERENTIAL PRESSURE (DP) SWITCH (DPS). IF FILTER DP EXCEEDS DP SETPOINT, DDC SHALL PROVIDE AN ALARM TO THE BAS.
9. DUCT SMOKE DETECTOR(S) THRU FIRE ALARM SYSTEM CONTROL MODULE SHALL DEACTIVATE MAU-1 SF & EF-25 WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
10. DDC SHALL MONITOR MAU-1 AND EF-25 FAN RUNNING STATUS VIA CURRENT SWITCH FOR BAS DISPLAY. DDC SHALL TOTALIZE FAN RUN TIME HOURS OF OPERATION FOR BAS DISPLAY.
11. MAU-1 AND EF-25 FANS DO NOT RUN IN UNOCCUPIED MODE OR IF OVERRIDDEN OFF BY FIRE SUPPRESSION INTERLOCK RELAY.

OTHER KITCHEN FANS:

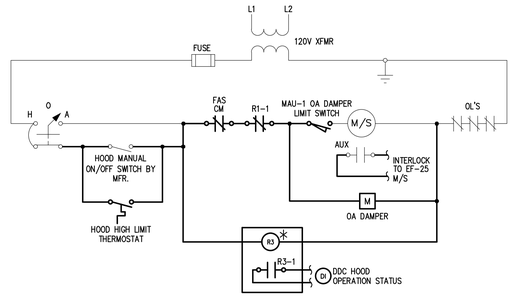
12. EF-25 & EF-26 SHALL HAVE START/STOP CONTROL FROM DDC AND RUN FROM BAS TIME OF DAY SCHEDULED OCCUPIED MODE.
13. DDC SHALL MONITOR EXHAUST FAN STATUSES THRU THE CURRENT SWITCHES. AN ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
14. EF-26 SHALL RUN IN OCCUPIED MODE UNLESS SHUTDOWN BY FIRE SUPPRESSION SYSTEM INTERLOCK RELAY.
15. EF-24 SHALL RUN IN OCCUPIED MODE UNLESS SHUTDOWN BY FIRE SUPPRESSION SYSTEM INTERLOCK RELAY OR BY DDC WHEN EXHAUST HOOD EF-25 RUNS.
16. EF-25 & EF-26 EXHAUST FANS DO NOT RUN IN UNOCCUPIED MODE OR IF OVERRIDDEN OFF BY FIRE SUPPRESSION INTERLOCK RELAY.



HOOD FIRE SUPPRESSION SYSTEM INTERLOCK WIRING

NOTE:

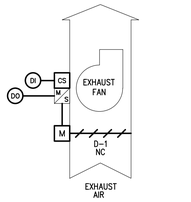
1. COORDINATE WIRING AND TERMINATION REQUIREMENTS WITH THE FIRE SUPPRESSION SYSTEM PROVIDER.



MAU-1 SF M/S WIRING

NOTES:

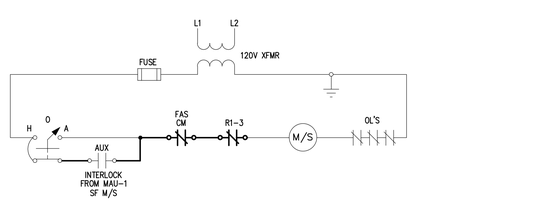
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH STARTER SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.



EF-24/26 CONTROL

SEQUENCE OF OPERATION:

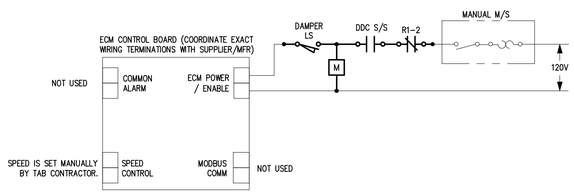
1. EXHAUST FAN SHALL HAVE START/STOP FROM A LINE VOLTAGE THERMOSTAT. WIRING INTERLOCK SHALL OPEN DAMPER, LIMIT SWITCH SHALL MAKE, AND FAN SHALL RUN.
2. INITIAL ROOM TEMP SETPOINT SHALL BE 78°F. THERMOSTAT SHALL PROVIDE 3°F DEADBAND FOR CONTROL. SETPOINT SHALL BE ADJUSTABLE AT THE THERMOSTAT.
3. EXHAUST FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH.



HOOD EXHAUST EF-25 M/S CONTROL WIRING

NOTES:

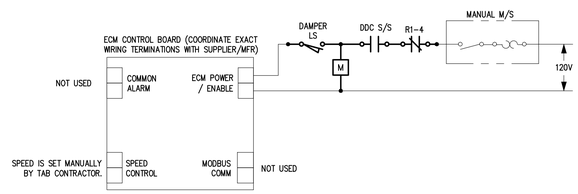
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. PROVIDE CURRENT SWITCH ON FAN MOTOR LEADS. STATUS SHALL BE MONITORED BY DDC AND DISPLAYED AT BAS.



EF-24 ECM CONTROL WIRING

NOTES:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.



EF-26 ECM CONTROL WIRING

NOTES:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.

TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M8.1 APPLY TO THIS DRAWING.

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PBA Project No: 2019-0237

PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

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08-12-2019	SCHEMATIC DESIGN

DRAWN	DJT
CHECKED	SVM
APPROVED	RNR

PROJECT NO.

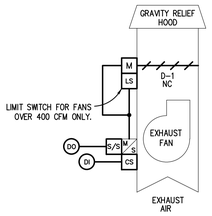
19040

DRAWING NO.

M8.7-BP3

TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M8.1 APPLY TO THIS DRAWING.



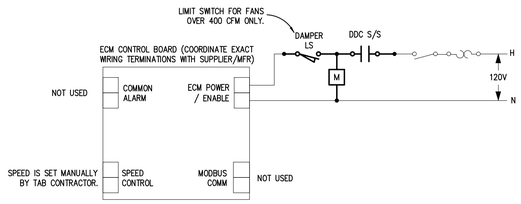
INLINE EXHAUST FAN W/GRH CONTROL
ROOF-MOUNTED EXHAUST FAN CONTROL

EF-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22, -23, -28, -29, -31, -36, & -40

SEQUENCE OF OPERATION

SEQUENCE OF OPERATION:

1. FOR EXHAUST FANS WITH AN ASSOCIATED RTU: EXHAUST FAN SHALL BE STARTED AND STOPPED BY DDC BASED ON BAS TIME OF DAY BUILDING SCHEDULE FOR THE ASSOCIATED RTU. WIRING INTERLOCK SHALL OPEN DAMPERS, LIMIT SWITCH SHALL MAKE, AND FAN SHALL RUN.
2. FOR EXHAUST FANS WITHOUT AN ASSOCIATED RTU: EXHAUST FAN SHALL BE STARTED AND STOPPED BY DDC BASED ON BAS TIME OF DAY BUILDING OCCUPANCY SCHEDULE. WIRING INTERLOCK SHALL OPEN DAMPERS, LIMIT SWITCH SHALL MAKE, AND FAN SHALL RUN.
3. DDC SHALL MONITOR FAN STATUS THRU THE CURRENT SWITCH. AN ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.

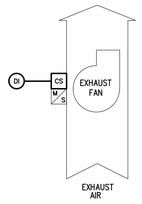


1-PHASE, 120V, EXHAUST FAN ECM WIRING

TYPICAL

NOTES:

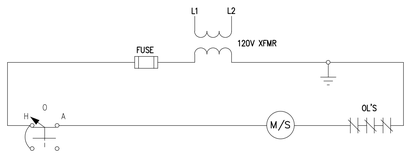
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.



EXHAUST FAN EF-32 & EF-33 CONTROL

SEQUENCE OF OPERATION:

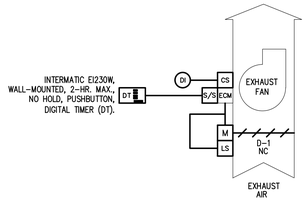
1. EXHAUST FANS SHALL RUN CONTINUOUSLY FROM THE H-O-A SWITCH.
2. EXHAUST FAN STATUSES SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. DDC SHALL PROVIDE THE BAS WITH AN ALARM IF FANS ARE SENSED "OFF."



EF-32 & EF-33 M/S WIRING

NOTES:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.



EF-30, -34, -35, -36 CONTROL

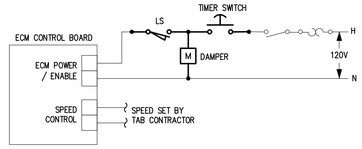
SEQUENCE OF OPERATION:

NOTE:

1. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.
2. MOUNT DIGITAL TIMER WHERE SHOWN ON MECHANICAL OR ELECTRICAL PLANS. COORDINATE COLOR AND LOCATION WITH ARCHITECT. TIME SHALL HAVE "NO HOLD" FEATURE.

SEQUENCE OF OPERATION:

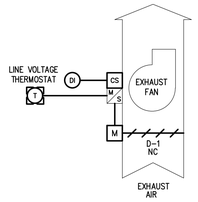
1. EXHAUST FAN SHALL HAVE START/STOP CAPABILITY FROM MANUALLY CONTROLLED WALL-MOUNTED, DIGITAL TIMER. WHEN ACTIVATED BY TIMER, DAMPER SHALL OPEN THRU INTERLOCK WIRING WHICH MAKES LIMIT SWITCH WHICH SHALL ALLOW FAN TO START. WHEN TIME PERIOD ENDS, EXHAUST FAN SHALL TURN OFF AND DAMPER SHALL CLOSE.
2. DDC SHALL MONITOR EXHAUST FAN RUN STATUS THRU CURRENT SWITCH.



EF-30, -34, & -35 ECM WIRING

NOTES:

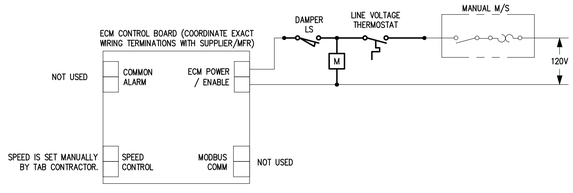
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.



EXHAUST FAN EF-27, -38, & -39 CONTROL

SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL HAVE START/STOP FROM A LINE VOLTAGE THERMOSTAT. WIRING INTERLOCK SHALL OPEN DAMPER, LIMIT SWITCH SHALL MAKE, AND FAN SHALL RUN.
2. INITIAL ROOM TEMP SETPOINT SHALL BE 78°F. THERMOSTAT SHALL PROVIDE 3°F DEADBAND FOR CONTROL. SETPOINT SHALL BE ADJUSTABLE AT THE THERMOSTAT.
3. EXHAUST FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH.



EF-27, -38, & -39 ECM CONTROL WIRING

NOTES:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.

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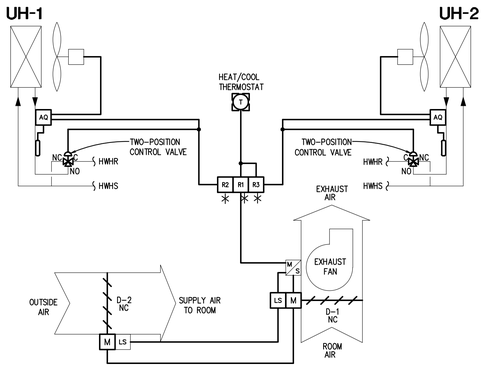
M8.8-BP3



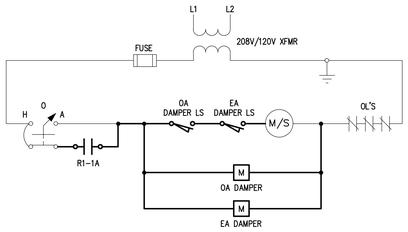
MECH ROOM H108 EF-37/UH-1/UH-2 CONTROL

NOTES:

1. PROVIDE GUARD FOR THERMOSTAT.
2. MOUNT RELAYS IN NEAREST AUXILIARY CONTROL PANEL FOR TEMPERATURE CONTROLS.

SEQUENCE OF OPERATION:

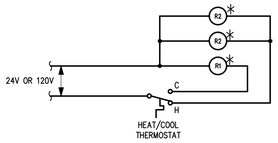
1. HEAT/COOL THERMOSTAT SHALL START ENERGIZE CONTROL CIRCUIT WHEN SPACE TEMP IS ABOVE SETPOINT OF 78°F (ADJUSTABLE). CONTROL WIRING INTERLOCK SHALL OPEN OA/EA DAMPERS. WHEN LIMIT SWITCHES SHALL FAN SHALL RUN. WHEN SPACE TEMP IS BELOW SETPOINT OF 76°F (ADJUSTABLE). SPRING RETURN DAMPER ACTUATORS SHALL CLOSE OA/EA DAMPERS.
2. HEAT/COOL THERMOSTAT SHALL OPEN HWH VALVE WHEN SPACE TEMP IS BELOW SETPOINT OF 66°F (ADJUSTABLE). UH FAN SHALL ACTIVATE UPON PROOF OF HWHR FLOW BY AQUASTAT. AQUASTAT SHALL PROVIDE 4°F DEADBAND FOR CONTROL.
3. THERMOSTAT SHALL PROVIDE 2°F DEADBAND CONTROL AROUND SETPOINTS.
4. ✳ INDICATES PANEL MOUNTED COMPONENT.



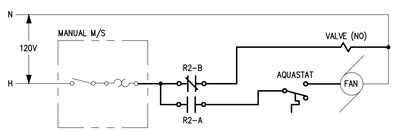
MECH ROOM H108 EF-37 ECM WIRING

NOTES:

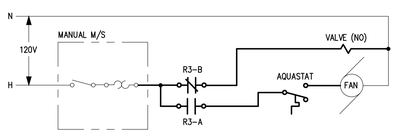
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.



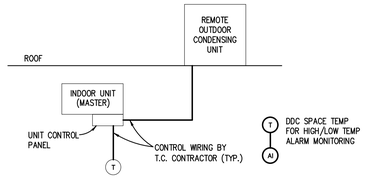
MECH ROOM H108 THERMOSTAT AND CONTROL RELAYS WIRING



MECH ROOM H108 UH-1 CONTROL WIRING



MECH ROOM H108 UH-2 CONTROL WIRING



PACKAGED ACU FIELD WIRING & CONTROL

TYPICAL – REFER TO MECH FLOOR PLANS FOR QTY & LOCATIONS

NOTES:

1. TC CONTRACTOR SHALL PROVIDE FIELD WIRING BETWEEN INDOOR UNIT CONTROLS AND THE REMOTE CONDENSER.
2. TC CONTRACTOR SHALL INSTALL THERMOSTAT PROVIDED BY ACU SUPPLIER AND PROVIDE REQUIRED FIELD WIRING.
3. TC CONTRACTOR SHALL COORDINATE WITH MANUFACTURER FOR EXACT TERMINATIONS AND WIRING REQUIREMENTS.

SEQUENCE OF OPERATION:

1. ACU SHALL RUN FROM MFR. FURNISHED ROOM THERMOSTAT.
2. DDC SHALL MONITOR SPACE TEMP AND ACTIVATE ALARM IF HIGH OR LOW LIMIT SETPOINTS ARE REACHED.

DDC CONTROLLED EXTERIOR WATER SHUTOFF VALVES

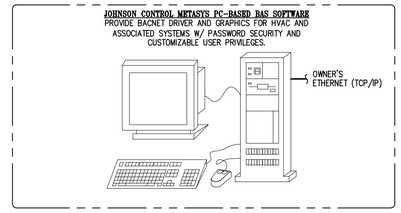
NOTES:

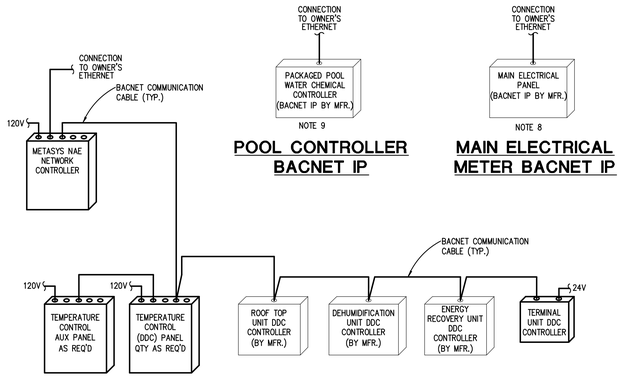
1. REFER TO PLUMBING DRAWINGS FOR LOCATIONS AND QUANTITIES OF VALVES TO BE CONTROLLED BY DDC/BAS.
2. TC CONTRACTOR SHALL PROVIDE REQUIRED POWER SUPPLIES FROM SPARE CIRCUITS WHERE IDENTIFIED ON ELECTRICAL PANEL SCHEDULES. COORDINATE WITH ELEC CONTRACTOR. REFER TO ELECTRICAL DRAWINGS FOR PANEL LOCATIONS.
3. DDC COMMANDABLE DIGITAL OUTPUT MAY BE FROM THE NEAREST DDC OR TERMINAL UNIT CONTROLLER. PROVIDE RELAY TO HANDLE POWER LOAD OF VALVE (IF REQUIRED).

SEQUENCE OF OPERATION

DDC CONTROLLED VALVES FOR EXTERIOR PLUMBING – SEQUENCE OF OPERATION:

1. DDC SHALL CONTROL VALVES FOR EXTERIOR PLUMBING CONNECTIONS FROM BAS TIME OF DAY SCHEDULED BUILDING OCCUPANCY SCHEDULE.
2. MAINTENANCE THAT IS SCHEDULED THAT REQUIRES EXTERIOR WATER ON WEEKENDS SHALL BE PROVIDED BY A BAS "EVENT" SCHEDULE. WHEN THE "EVENT" SCHEDULED PERIOD ENDS, DDC CONTROL SHALL REVERT TO THE REGULARLY SCHEDULED OPERATION.
3. WHEN BAS BUILDING OCCUPIED MODE BEGINS, DDC SHALL COMMAND THE VALVE "ON" SUCH THAT WATER IS AVAILABLE TO THE FOLLOWING POSSIBLE CONNECTIONS:
   - 3.1. EXTERIOR WALL HYDRANT.
   - 3.2. EXTERIOR POST HYDRANT.
   - 3.3. EXTERIOR DRINKING FOUNTAIN.
4. WHEN BAS BUILDING OCCUPIED MODE ENDS, DDC SHALL COMMAND THE VALVE "OFF" TO PREVENT OUTSIDE USE OF WATER.





DDC SYSTEM ARCHITECTURE

NO SCALE

NOTES:

1. REFER TO TEMPERATURE CONTROL SCHEMATICS FOR THE REQUIRED POINTS ASSOCIATED FOR EACH SYSTEM.
2. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS AND QUANTITIES OF HVAC UNITS, SYSTEMS, & TERMINAL UNITS.
3. JCI (TC CONTRACTOR) SHALL DETERMINE DDC PANEL QUANTITY BASED ON POINT DENSITIES AND AVAILABLE MOUNTING SPACE. UNLESS SPECIFICALLY NOTED IN DESIGN DRAWINGS, TC CONTRACTOR SHALL LOCATE DDC PANELS AND COORDINATE WITH OTHER TRADES.
4. TC CONTRACTOR SHALL PROVIDE REQUIRED POWER SUPPLIES FROM SPARE EMERGENCY POWER CIRCUITS WHERE IDENTIFIED ON ELECTRICAL PANEL SCHEDULES. COORDINATE WITH ELEC CONTRACTOR. REFER TO ELECTRICAL DRAWINGS FOR PANEL LOCATIONS.
5. 24V TRANSFORMERS REQUIRED FOR TERMINAL UNIT DDC CONTROLLERS SHALL BE LOCATED IN MECHANICAL OR ELECTRICAL ROOMS – COORDINATE LOCATIONS. MAXIMUM TRANSFORMER SIZE SHALL BE 100VA. PROVIDE ENCLOSURE(S) FOR TRANSFORMERS.
6. BUILDING DDC NETWORK SHALL BE CONNECTED TO THE ETHERNET, TC CONTRACTOR SHALL PROVIDE DDC PANEL OR OTHER INTERFACE COMPONENT COMPATIBLE FOR THIS CONNECTION. COORDINATE ETHERNET CONNECTION AND I/P ADDRESS WITH OWNER'S INFORMATION TECHNOLOGY PERSONNEL.
7. PROVIDE AUXILIARY PANEL(S) FOR GAUGES, TRANSMITTERS, RELAYS, POWER TRANSFORMERS, ETC.
8. PROVIDE UP TO 25 BACNET POINTS IN A UNIQUE GRAPHIC FOR MONITORING OF BUILDING POWER.
9. COORDINATE BACNET POINTS WITH POOL EQUIPMENT SUPPLIER AND PROVIDE INTEGRATION POINTS ON OWNER'S BAS GRAPHICS.

TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M8.1 APPLY TO THIS DRAWING.

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PROJECT TITLE

New High Point School Washtenaw Intermediate School District

1735 South Wagner Road
Ann Arbor, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
05-27-2020	FOR CONSTRUCTION – BID PACK #3
05-01-2020	95% REVIEW – BP3
12-06-2019	DESIGN DEVELOPMENT
08-12-2019	SCHEMATIC DESIGN

DRAWN DJT
CHECKED SVM
APPROVED RNR

PROJECT NO.
19040

DRAWING NO.
M8.9-BP3