HPS HVAC Improvements - Phase 2

Early Childhood Elementary

11680 McDougall St., Hamtramck, MI 48212

PARTNERS

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65 Market Street
Mount Clemens, MI 48043
586-469-3600

Owner:

Hamtramck Public Schools

3201 Roosevelt St.
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313-872-9270

Structural Engineer:

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248-879-5666

List of Drawings	
Sheet Number	Sheet Title
A0-00	Cover Sheet
Architectural	
A0-01	General Information
A0-02	Room Finish Schedule, Details
A0-03	Code and Life Safety Information
A1-01	Lower Level Demolition Plan
A1-02	Ground Level Demolition Plan
A1-03	Upper Level Demolition Plan
A3-01	Lower Level Floor Plan
A3-02	Ground Level Floor Plan
A3-03	Upper Level Floor Plan
A3-20	Demolition and New Work Roof Plan
A4-01	Lower Level Reflected Ceiling Plan
A5-01	Exterior Elevations
A6-01	Wall Sections and Details
A8-01	Interior Elevations
Structural	
S3-01	ROOF FRAMING PLAN, DETAILS
Mechanical	
M0-01	Mechanical Standards and Drawing Index
M1-01	Lower Level Mechanical Demolition Plan
M1-02	Ground Level Mechanical Demolition Plan
M1-03	Upper Level Mechanical Demolition Plan
M2-02	Ground Level Plumbing Plan
M2-20	Roof Plumbing Plan
M3-02	Ground Level HVAC Piping Plan
M3-03	Upper Level HVAC Piping Plan
M4-01	Lower Level Sheet Metal Plan
M4-02	Ground Level Sheet Metal Plan
M4-03	Upper Level Sheet Metal Plan
M4-20	Roof Sheet Metal Plan
M5-01	Enlarged Mechanical Boiler Plans
M6-01	Mechanical Details
M6-02	Mechanical Details
M6-03	Mechanical Details
M6-04	Mechanical Details
M7-01	Mechanical Schedules
M7-02	Mechanical Schedules
M7-03	Mechanical Schedules
M7-04	Mechanical Schedules
M8-01	Temperature Control Standards and General Notes
M8-02	Temperature Controls
M8-03	Temperature Controls
M8-04	Temperature Controls

List of Drawings (Continued)	
Sheet Number	Sheet Title
Electrical	
E0-01	Electrical Standards and Drawing Index
E0-02	Electrical Standard Schedules
E0-03	Electrical Site Plan
E1-01	Lower Level Electrical Demolition Plan
E1-02	Ground Level Electrical Demolition Plan
E1-03	Upper Level Electrical Demolition Plan
E2-01	Lower Level Lighting Plan
E3-01	Lower Level Power Plan
E3-02	Ground Level Power Plan
E3-03	Upper Level Power Plan
E4-20	Roof Electrical Plan
E5-01	One Line Diagram - Demolition
E5-02	One Line Diagram - New Work
E5-03	Panel Schedules
E6-01	Enlarged Electrical Boiler Demolition and New Work Plans
E7-01	Electrical Details and Diagrams

PARTNERS

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LOCATION MAP

NORTH

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
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PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
90% Review	06/24/2022
Bidding - Construction	08/30/2022

DRAWN BY

AAA

CHECKED BY

DRM

APPROVED BY

MAM

SHEET NAME

COVER SHEET

SHEET NO.

A0-00

Abbreviations

A

AFF	ABOVE FINISHED FLOOR
ARF	ABOVE REFERENCE FLOOR
ACCT	ACCENT
AP	ACCESS PANEL
AC	ACOUSTICAL
ACT	ACOUSTICAL TILE (OR ACTIVE)
ADD	ADDENDUM
ADDL	ADDITIONAL
ADJ	ADJACENT
AGG	AGGREGATE
A/C	AIR CONDITIONING
ALT	ALTERNATE OR ALTERNATIVE
AL.ALUM	ALUMINUM
ANCH	ANCHOR, ANCHORAGE
AB	ANCHOR BOLT
ANOD	ANODIZED
ARCH	ARCHITECT(URAL)
ASPH	ASPHALT
AUTO	AUTOMATIC

B

B.F.	BARRIER FREE
BP BP_L	BASE PLATE OR BEARING P_L
BRG	BEARING
BM	BENCH MARK OR BEAM
BETW	BETWEEN
BIT	BITUMINOUS
BLKG	BLOCKING
BO	BOARD
BS	BOTH SIDES
BOT	BOTTOM
BC	BOTTOM OF CURB
BRK	BRICK
BLDG	BUILDING
BL	BUILDING LINE

C

CABT	CABINET
CR	CARD READER
CPT	CARPET(ED)
CES	CARPET EDGE STRIP
CI	CAST IRON
CIP	CAST-IN-PLACE
CB	CATCH BASIN
CLG	CEILING
CEM	CEMENT
C TO C	CENTER TO CENTER
CM	CENTIMETER(S)
C°	DEGREES CENTIGRADE
CER	CERAMIC
CT	CERAMIC TILE
CHAN	CHANNEL
CHBK PL	CHECKERED PLATE
CL	CLEAR(ANCE)
CLOS	CLOSET
CO	CLEAN OUT
CHK	COAT HOOK
CW	COLD WATER
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSED(.ION),(IBLE)
CONCE	CONCEALED
CONC	CONCRETE
CMU	CONCRETE MASONRY UNIT (CONCRETE BLOCK)
CONN	CONNECTION
CONST	CONSTRUCTION
CONST JT	CONSTRUCTION JOINT
CONT	CONTINUOUS OR CONTINUE
CONTR	CONTRACT(OR)
CJ	CONTROL JOINT
CORR	CORRUGATED OR CORRIDOR
CTR	CENTER
CTSK	COUNTERSUNK
CF	CUBIC FOOT
CY	CUBIC YARD
CYL	CYLINDER

D

DPR	DAMPER
DP	DAMPROOFING
DL	DEAD LOAD
DET	DETAIL
DIAG	DIAGONAL
∅	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
D/W	DISHWASHER
DO	DOOR OPENING
DN	DOWN
DT	DRAIN TILE
DWG	DRAWING
DF	DRINKING FOUNTAIN

E

EA	EACH
EF	EACH FACE
EW	EACH WAY
E	EAST
ELEC	ELECTRIC(AL)
EWC	ELECTRIC WATER COOLER
EL	ELEVATION
ELEV	ELEVATOR
EMER	EMERGENCY
ENC	ENCLOSE(S), (URE)
EP	EPOXY
EQ	EQUAL
EQUIP	EQUIPMENT
ESC	ESCALATOR
EPDM	ETHYLENE PROPYLENE DIENE MONOMERS
EXH	EXHAUST
EB	EXPANSION BOLT
EJ	EXPANSION JOINT
EXP CONST	EXPOSED CONSTRUCTION
EXT	EXTERIOR
ETR	EXISTING TO REMAIN

F

FWP	FABRIC WRAPPED PANEL
FB	FACE BRICK
FOC	FACE OF CONCRETE
FF	FACTORY FINISH
FS	FAR SIDE
F°	DEGREES FAHRENHEIT
FT	FEET/FOOT
FIN	FINISH(ED)
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FVC	FIRE VALVE CABINET
FLD	FIELD
FHS	FIRE HOSE STATION
FPR	FIRE PROOFING
FL	FLOOR(ING)
FD	FLOOR DRAIN
FLUOR	FLUORESCENT
FTG	FOOTING
FDN	FOUNDATION
FA	FRESH AIR
FSRS	FULLY-ADHERED SHEET ROOFING SYSTEM
FURR	FURR(ED), (ING)

G

GA	GAGE, GAUGE
GAL	GALLON
GALV	GALVANIZED
GL	GLASS, GLAZING
GR	GRADE, GRADING
g	GRAM
GRD	GROUND
GYP	GYPSUM
GYP L	GYPSUM LATH
GP	GYPSUM PLASTER
GWB	GYPSUM WALL BOARD

H

HDCP	HANDICAP(PED)
HDBD	HARDBOARD
HDWE	HARDWARE
HWD	HARDWOOD
HTG	HEATING
H&V	HEATING & VENTILATING
HVAC	HEATING/VENTILATION/ AIR CONDITIONING
HT	HEIGHT
H	HIGH
HP	HIGH POINT
HS	HIGH STRENGTH
HC	HOLLOW CORE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HP	HORSE POWER
HB	HOSE BIBB
HW	HOT WATER
HWH	HOT WATER HEATER
HR	HOUR

I

IN(")	INCH(ES)
INCL	INCLUDE(D), (ING)
INFO	INFORMATION
ID	INSIDE DIMENSION
INSUL	INSULATE(D), (ION)
ICA	INTEGRAL COLOR ANODIZED
INT	INTERIOR/INTERNAL
INTERM	INTERMEDIATE
INV	INVERT
IRR	IRRIGATION

J

JC	JANITOR'S CLOSET
JT	JOINT
JST	JOIST
JB	JUNCTION BOX

K

kg	KILOGRAMS
KV	KILOVOLT
KVA	KILOVOLT/AMPERE
KW	KILOWATT(S)
KWH	KILOWATT-HOUR
kg/m	KILOGRAM PER METER
kg/cm^2	KILOGRAM PER SQUARE CENTIMETER
KSI	KIPS PER SQUARE INCH
KIT	KITCHEN
KO	KNOCKOUT

L

LAB	LABORATORY
LAM	LAMINATE(D)
LAV	LAVATORY
LCC	LEAD COATED COPPER
LH	LEFT HAND
LHR	LEFT HAND REVERSE
L	LENGTH
LT	LIGHT
LTG	LIGHTING
LP	LIGHTING PANEL
LIN	LINEAR, LINEAL
LSWD	LINEAR SUSPENDED WOOD CEILING
LL	LIVE LOAD
LG	LONG
LLBB	LONG LEGS BACK TO BACK
LLH	LONG LEG HORIZONTAL
LLO	LONG LEG OUTSTANDING
LLV	LONG LEG VERTICAL
LOC	LOCATE/LOCATION
L.P.	LOW POINT
LV	LOW VOLTAGE

M

MAG	MAGNETIC
MH	MANHOLE
MFR	MANUFACTURER(R)
MAR	MARBLE
MAR T.	MARBLE THRESHOLD
MKB	MARKER BOARD
MAS	MASONRY
MO	MASONRY OPENING
MAT	MATERIAL(S)
MAX	MAXIMUM
MECH	MECHANICAL
MC	MEDICINE CABINET
MED	MEDIUM
MEM	MEMBER
MEMB	MEMBRANE
MET	METAL
MDS	METAL DIVIDER STRIP
ML	METAL LATH
MET T.	METAL THRESHOLD
MEZZ	MEZZANINE
mm	MILLIMETER(S)
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MISC	MISCELLANEOUS IRON
MON	MONITOR(ED)
MCC	MOTOR CONTROL CENTER
MTD	MOUNT(ED), (ING)
MULL	MULLION

N

NAT	NATURAL
NCA	NATURAL COLOR ANODIZED
NEG	NEGATIVE
NRC	NOISE REDUCTION COEFFICIENT
NONCOMB	NONCOMBUSTIBLE
NOM	NOMINAL
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NO (#)	NUMBER

O

OFF	OFFICE
O/C	ON CENTER(S)
OPG	OPENING
OPP	OPPOSITE
OPP HD	OPPOSITE HAND
ORIG	ORIGINAL
Oz	OUNCE
OS	OUTSIDE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OH	OVERHEAD

P

PH	PHYSICALLY HANDICAPPED
PT	PAINT(ED) (OR POINT)
PR	PAIR
PNL	PANEL
PTD	PAPER TOWEL DISPENSER
PTD/R	PAPER TOWEL DISPENSER & RECEPTACLE COMBINATION
PKG	PARKING
PBD	PARTICLE BOARD
PARTN	PARTITION
PE	PASSENGER ELEVATOR
PERM	PERMANENT
PLAS	PLASTER
PL	PLASTIC LAMINATE
P_L	PLATE
PLBG	PLUMBING
PLWD	PLYWOOD
POL	POLISHED
PVC	POLYVINYL CHLORIDE
lb/#	POUND(S)
PCF	POUNDS PER CUBIC FOOT
PPF	POUNDS PER FOOT
PLF	POUNDS PER LINEAL FOOT
PSF	POUNDS PER SQUARE FOOT
PC	PRECAST CONCRETE
PRE-FAB	PREFABRICATE(D)
PTR	PRESERVATIVE TREATED WOOD

Q

QT	QUARRY TILE
QB	QUARRY TILE BASE
QTR	QUARTER

R

RAD	RADIUS, RADIATOR, RADIATION
RC	RAINWATER CONDUCTOR
RECVG	RECEIVING
REC	RECESS(ED)
REF	REFERENCE
REFL	REFLECTED, (IVE), (OR)
REFR	REFRIGERATOR
REG	REGISTER
REINF	REINFORCE(D), (ING)
REQD	REQUIRED
RESIL	RESILIENT
RT	RESILIENT TILE
RA	RETURN AIR
REV	REVISION(S), REVISED
RH	RIGHT HAND
RHR	RIGHT HAND REVERSE
ROW	RIGHT OF WAY
R	RISER
Rd	ROAD

R (CONT.)

RD	ROOF DRAIN
RS	ROOF SUMP
RFG	ROOFING
RM	ROOM
RO	ROUGH OPENING
RUB	RUBBER
RB	RUBBER BASE (OR RESILIENT BASE)

S

SAN	SANITARY
SND	SANITARY NAPKIN DISPENSER
SNWR	SANITARY NAPKIN WASTE RECEPTACLE
SCH	SCHEDULE
SJ	SCORED JOINT
S.CONC	SEALED CONCRETE
SEAL	SEALER
SECT	SECTION
SS	SERVICE SINK
SHT	SHEET
SLO	SHORT LEG OUTSTANDING
SIM	SIMILAR
SK	SINK
SB	SOIL BORING
STC	SOUND TRANSMISSION CLASS
S	SOUTH
SPC	SPACER, SPACING
SPK	SPEAKER
SPEC(S)	SPECIFICATION(S)
SPEC'D	SPECIFIED
SQ	SQUARE
cm^2	SQUARE CENTIMETER
SF	SQUARE FOOT (OR STOREFRONT) (OR SPORTS FLOORING)
STAG	STAGGERED
SST	STAINLESS STEEL
STD	STANDARD
STA	STATION
STL	STEEL
STN	STONE
STOR	STORAGE
SD	STORM DRAIN
ST	STREET
STRUCT	STRUCTURAL
SA	SUPPLY AIR
SUPP	SUPPORTS
SUSP	SUSPENDED
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRY(ICAL)

T

TKB	TACKBOARD
TP	TANGENT POINT
TEL	TELEPHONE
TV	TELEVISION
TEMP	TEMPERATURE, TEMPERED
TERR	TERRAZZO
TT	TERRAZZO TILE
THERM	THERMOSTAT
THK	THICK(NESS)
THRES	THRESHOLD
THRU	THROUGH/THOUGHOUT
TOL	TOILET
TPH	TOILET PAPER HOLDER
TOL	TOLERANCE
T&G	TONGUE AND GROOVE
T&B	TOP & BOTTOM
TE	TOP ELEVATION
TOC	TOP OF CONCRETE
TC	TOP OF CURB
TOS	TOP OF STEEL
TWC	TOWEL & WASTE CABINET
TRAN	TRANSFORMER
T	TREAD
TYP	TYPICAL

U

UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
UR	URINAL

V

VA	VALVE
VB	VAPOR BARRIER
VR	VAPOR RETARDER
VAR	VARNISH
VERT	VERTICAL
VEST	VESTIBULE
VIN	VINYL
VCT	VINYL COMPOSITION TILE
VT	VINYL TILE
VWC	VINYL WALL COVERING
VIT	VITREOUS
VRS	VINYL RESILIENT STRIP

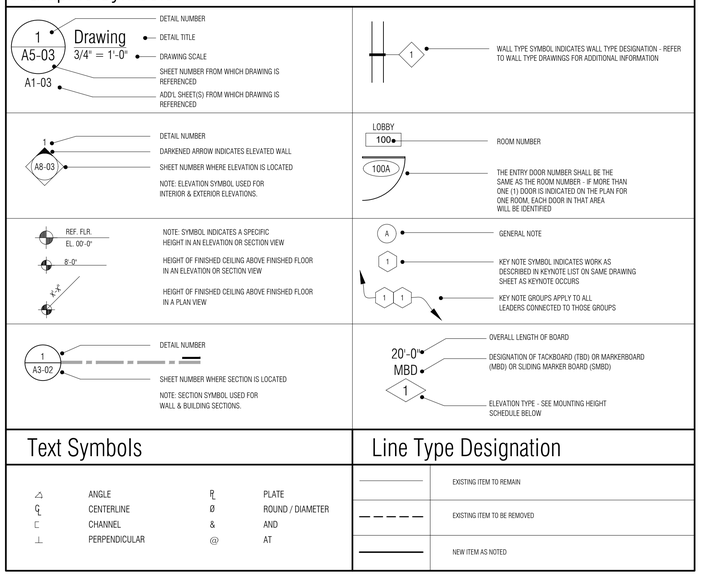
W

WAIN	WAINSCOT
WHYD	WALL HYDRANT
WH	WATER HEATER
WC	WATER CLOSET
WM	WATER MAIN
WP	WATERPROOFING
WR	WATER RESISTANT
WS	WATERSTOP
WT	WEIGHT
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
W	WIDTH, WIDE, WEST
W/	WITH
W/O	WITHOUT
WD	WOOD

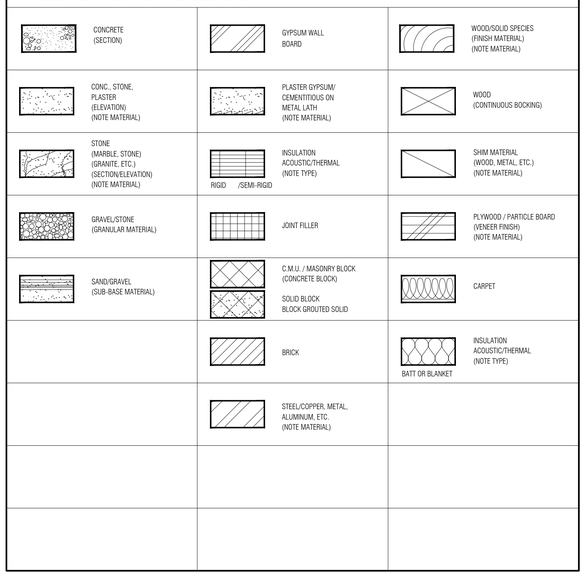
Y

YD	YARD

Graphic Symbols



Material Poche Indications



Text Symbols

∠	ANGLE	P_L	PLATE
C_L	CENTERLINE	Ø	ROUND / DIAMETER
⊏	CHANNEL	&	AND
⊥	PERPENDICULAR	@	AT

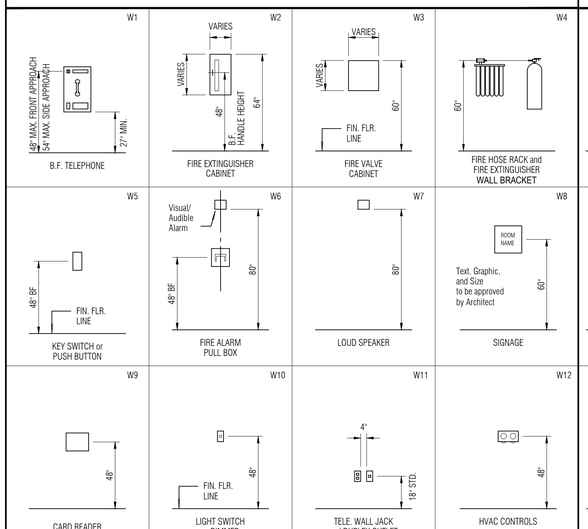
Line Type Designation

———	EXISTING ITEM TO REMAIN
- - - -	EXISTING ITEM TO BE REMOVED
———	NEW ITEM AS NOTED

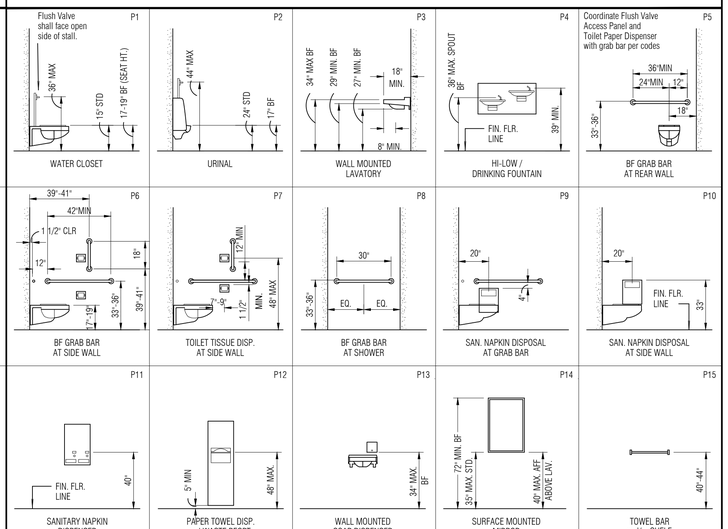
Mounting Height Schedule

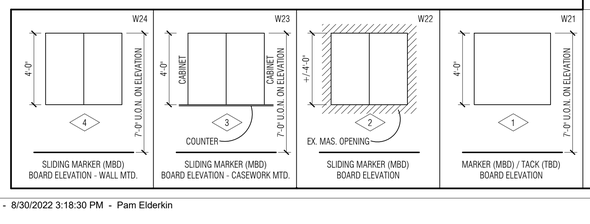
NOTE:
- NOT ALL HEIGHTS SHOWN ARE TYPICAL FOR ALL ITEMS WHERE THEY OCCUR
- UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS, (B.F. DENOTES BARRIER FREE REQUIREMENTS)
- NOT ALL ITEMS SHOWN ON THIS DRAWING MAY OCCUR ON THIS PROJECT

WALL MOUNTED ACCESSORIES



PLUMBING FIXTURES and TOILET ACCESSORIES





PARTNERS

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MOUNT CLEMENS, MI 48043
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CONSULTANT

KEY PLAN

OWNER

Hamtramck Public Schools

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SHEET NAME

GENERAL INFORMATION

SHEET NO.

A0-01

Room Finish Schedule

ROOM NO.	ROOM NAME	FLOOR	BASE	WALLS				CEILING FINISH	ROOM FINISH KEY NOTES
				NORTH	EAST	SOUTH	WEST		
001	CAFE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
006	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
007	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
009	BOYS TOILET	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
010	GIRLS TOILET	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
012	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
013	VESTIBULE	ETE	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
101	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
102	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
103	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
104	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
105	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
106	VESTIBULE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
107	TOILET ROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
108	VESTIBULE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
109	MAIN OFFICE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
110	BREAK ROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
111	OFFICE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
112	WORK ROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
113	TOILET ROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
114	OFFICE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
115	WORK ROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
116	GIRLS TOILET ROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
117	BOYS TOILET ROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
119	CORRIDOR	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
120	CORRIDOR	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
121	VESTIBULE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
122	VESTIBULE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
123	OFFICE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
124	OFFICE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
125	GYMNASIUM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
S3	STAIR	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
S4	STIAR	ETR	ETR	P.NT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
S5	STAIR	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
201	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
202	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
203	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
204	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
205	CLASSROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3, 4
206	COMPUTER ROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
207	LIBRARY	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
208	GIRLS TOILET ROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
209	BOYS TOILET ROOM	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
211	CORRIDOR	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
212	CORRIDOR	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
214	MEZZANINE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3
217	STAGE	ETR	ETR	PNT-1	PNT-1	PNT-1	PNT-1	ETR	1, 2, 3

General Notes:

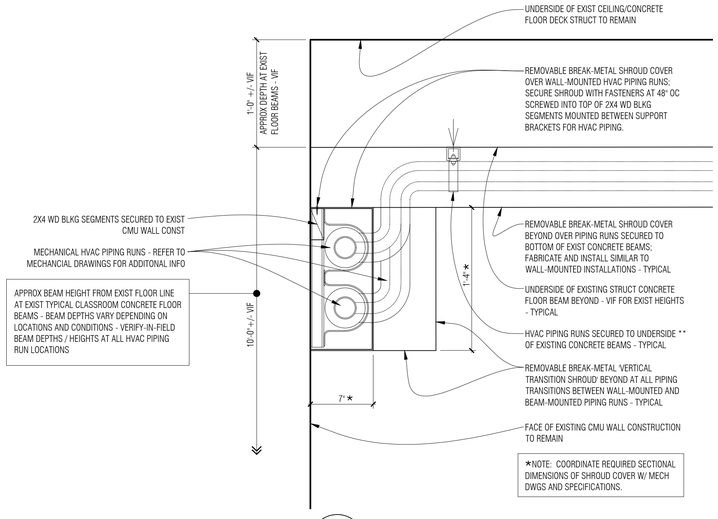
A. SCOPE OF WORK SHALL BE LIMITED TO NEW PAINT AT FULL EXTENT OF ALL PRE-EXISTING PAINTED CMU WALL SURFACES - REFER TO INTERIOR ELEVATIONS FOR APPROXIMATE LOCATIONS; CONTRACTOR TO VERIFY IN FIELD.

B. ETR: EXISTING TO REMAIN

C. CONFIRM ALL QUESTIONS RE EXTENT OF NEW PAINT WORK SCOPE WITH ARCHITECT PRIOR TO PROCEEDING.

Room Finish Key Notes:

1. PAINT AT FULL EXTENT OF ALL PRE-EXISTING PAINTED CMU WALL SURFACES - TYPICAL UON.
2. DO NOT PAINT EXISTING GLAZED BLOCK - TYPICAL.
3. DO NOT PAINT EXISTING CEILINGS AND/OR STRUCT CONCRETE FLOOR DECK AND/OR BEAMS - TYPICAL.
4. DO NOT PAINT EXISTING WOOD TRIM OR CASEWORK IN CLASSROOMS - TYPICAL.



2 / A8-01 Section at HVAC Piping Shroud Cover
1 1/2" = 1'-0"

PARTNERS

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CONSULTANT

KEY PLAN

PLAN NORTH

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

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50% Review	05/19/2022
90% Review	06/24/2022
Bidding - Construction	08/30/2022

DRAWN BY
MFS

CHECKED BY
DRM

APPROVED BY
MAM

SHEET NAME

ROOM FINISH SCHEDULE, WALL TYPES AND DETAILS

SHEET NO.

A0-02

BUILDING CODE INFORMATION

GENERAL INFORMATION

OWNER: HAMTRAMCK PUBLIC SCHOOLS

OWNER ADDRESS: 3201 Roosevelt Street
Hamtramck, MI 48212

PROJECT NAME: EARLY CHILDHOOD ELEMENTARY SCHOOL

PROJECT ADDRESS: 11680 McDougall Street
Hamtramck, MI 48212

SUMMARY OF WORK: HVAC IMPROVEMENTS TO AN EXISTING BUILDING

GOVERNING CODES:

2015 MICHIGAN BUILDING CODE (MBC), (IBC 2015 WITH AMENDMENTS)
2015 MICHIGAN REHABILITATION CODE, (IEBC 2015 WITH AMENDMENTS)
2015 MICHIGAN MECHANICAL CODE (MMC), (IMC 2015 WITH AMENDMENTS)
2018 MICHIGAN PLUMBING CODE (MPC), (IPC 2018 WITH AMENDMENTS)
2015 MICHIGAN ENERGY CODE (MEC), (IECC 2015 WITH AMENDMENTS AND ASHRAE 90.1-2013)
2017 NATIONAL ELECTRICAL CODE (NEC, NFPA 70) W/ PART 8 ELECTRICAL CODE RULES (AMENDMENTS) FOR MICHIGAN
2015 INTERNATIONAL FIRE CODE (IFC), (AS REFERENCED IN THE 2015 MBC)
2012 NFPA 101 - LIFE SAFETY CODE (WITH AMENDMENTS)
LICENSING RULES FOR CHILD CARE CENTERS, MICHIGAN BUREAU OF COMMUNITY AND HEALTH SYSTEMS

BUILDING DATA SUMMARY:

USE GROUPS:
GROUP E, EDUCATIONAL (2015 MBC, SECTION 305.1)
GROUP E, DAY CARE FACILITIES (2015 MBC, SECTION 305.2)

CONSTRUCTION TYPE:
CONSTRUCTION TYPE IIB, NONCOMBUSTIBLE MATERIALS (2015 MBC, SECTION 602.2)

BUILDING AREA:

LOWER LEVEL =	6,398 SQUARE FEET (EXISTING)
GROUND LEVEL =	15,195 SQUARE FEET (EXISTING FOOTPRINT ON SITE)
UPPER LEVEL =	8,023 SQUARE FEET (EXISTING)
TOTAL EXISTING BUILDING AREA =	29,616 SQUARE FEET (ALL LEVELS)

NO ADDITIONS OR REDUCTIONS TO EXISTING BUILDING AREA PLANNED

BUILDING HEIGHT:
EXISTING BUILDING HEIGHT TO REMAIN UNCHANGED

AUTOMATIC FIRE SUPPRESSION:
NONE - EXISTING BUILDING IS NOT PROTECTED BY AN AUTOMATIC FIRE SUPPRESSION SYSTEM

FIRE ALARM SYSTEM:
EXISTING MANUAL FIRE ALARM SYSTEM TO REMAIN.

OCCUPANT LOAD:
NO CHANGE TO EXISTING OCCUPANT LOAD PLANNED. STUDENT POPULATION CONSISTS OF PRE-K THROUGH SECOND GRADE, AGES 4 TO 8 YEARS.

MICHIGAN REHABILITATION CODE SUMMARY:

CLASSIFICATION OF WORK:

ALTERATION - LEVEL 1
REMOVAL AND REPLACEMENT OR THE COVERING OF EXISTING MATERIALS, ELEMENTS, EQUIPMENT, OR FIXTURES USING NEW MATERIALS, ELEMENTS, EQUIPMENT, OR FIXTURES THAT SERVE THE SAME PURPOSE (2015 MICH. REHAB. CODE, SECTION 503.1).

ALTERATION - LEVEL 2
RECONFIGURATION OF SPACE, THE ADDITION OR ELIMINATION OF ANY DOOR OR WINDOW, THE RECONFIGURATION OR EXTENSION OF ANY SYSTEM, OR THE INSTALLATION OF ANY ADDITIONAL EQUIPMENT (2015 MICH. REHAB. CODE, SECTION 504.1).

REQUIREMENTS FOR ALTERATIONS:

ALTERATION - LEVEL 1
ALL NEWLY INSTALLED INTERIOR WALL AND CEILING FINISHES SHALL COMPLY WITH CHAPTER 8 OF THE INTERNATIONAL BUILDING CODE (2015 MICH. REHAB. CODE, SECTION 702.1)

NEW INTERIOR FLOOR FINISHES SHALL COMPLY WITH SECTION 804 OF THE INTERNATIONAL BUILDING CODE (2015 MICH. REHAB. CODE, SECTION 702.2)

ALL NEW WORK SHALL COMPLY WITH THE MATERIALS AND METHODS REQUIREMENTS IN THE INTERNATIONAL BUILDING CODE, INTERNATIONAL ENERGY CONSERVATION CODE, INTERNATIONAL MECHANICAL CODE, AND INTERNATIONAL PLUMBING CODE, AS APPLICABLE, THAT SPECIFY MATERIAL STANDARDS, DETAIL OF INSTALLATION AND CONNECTION, JOINTS, PENETRATIONS, AND CONTINUITY OF ANY ELEMENT, COMPONENT, OR SYSTEM IN THE BUILDING (2015 MICH. REHAB. CODE, SECTION 702.6).

ALTERATIONS SHALL BE DONE IN A MANNER THAT MAINTAINS THE LEVEL OF FIRE PROTECTION PROVIDED (2015 MICH. REHAB. CODE, SECTION 703.1).

ALTERATIONS SHALL BE DONE IN A MANNER THAT MAINTAINS THE LEVEL OF PROTECTION PROVIDED FOR THE MEANS OF EGRESS (2015 MICH. REHAB. CODE, SECTION 704.1).

EXISTING LEVEL OF ACCESSIBILITY SHALL BE MAINTAINED (2015 MICH. REHAB. CODE, SECTION 705.1).

WHERE ADDITION OR REPLACEMENT OF ROOFING OR REPLACEMENT OF EQUIPMENT RESULTS IN ADDITIONAL DEAD LOADS, STRUCTURAL COMPONENTS SUPPORTING SUCH REROOFING OR EQUIPMENT SHALL COMPLY WITH THE GRAVITY LOAD REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (2015 MICH. REHAB. CODE, SECTION [BS] 707.2).

ALTERATION - LEVEL 2
IN ADDITION TO REQUIREMENTS OF ALTERNATION - LEVEL 1, ALL WORK SHALL COMPLY WITH THE FOLLOWING:

ALL NEW CONSTRUCTION ELEMENTS, COMPONENTS, SYSTEMS, AND SPACES SHALL COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (2015 MICH. REHAB. CODE, SECTION 801.3).

ALL EXISTING INTERIOR VERTICAL OPENINGS CONNECTING TWO OR MORE FLOORS SHALL BE ENCLOSED WITH APPROVED ASSEMBLIES HAVING A FIRE-RESISTANCE RATING OF NOT LESS THAN 1 HOUR WITH APPROVED OPENING PROTECTIVES. VERTICAL OPENINGS OTHER THAN STAIRWAYS MAY BE BLOCKED AT FLOOR AND CEILING OF THE WORK AREA BY INSTALLATION OF NOT LESS THAN 2 INCHES OF SOLID WOOD OR EQUIVALENT CONSTRUCTION (2015 MICH. REHAB. CODE, SECTION 803.2.1).

THE INTERIOR FINISH OF WALLS AND CEILINGS IN EXITS AND CORRIDORS IN ANY WORK ARES SHALL COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (2015 MICH. REHAB. CODE, SECTION 803.4).

AUTOMATIC FIRE SUPPRESSION SYSTEM IS NOT REQUIRED IN GROUP E WORK AREA THAT DOES NOT EXCEED 50% OF THE FLOOR AREA (2015 MICH. REHAB. CODE, SECTION 804.2.2).

IN ANY WORK AREA, ANY OTHER SASH, GRILLE, OR OPENING IN A CORRIDOR AND ANY WINDOW IN A CORRIDOR NOT OPENING TO THE OUTSIDE AIR SHALL BE SEALED WITH MATERIALS CONSISTENT WITH THE CORRIDOR CONSTRUCTION (2015 MICH. REHAB. CODE, SECTION 80.5.3). CORRIDORS IN USE GROUP E, WITHOUT SPRINKLERS, SHALL HAVE A FIRE-RESISTANCE RATING OF 1-HOUR (2015 MBC, TABLE 1020.1). OPENING PROTECTIVE FOR CORRIDOR WALLS SHALL BE 20 MINUTES (2015 MBC, TABLE 716.5).

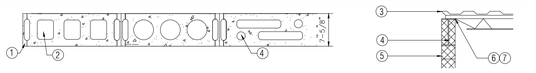
ACCESSIBILITY - A BUILDING, FACILITY, OR ELEMENT THAT IS ALTERED SHALL COMPLY WITH SECTION 410 (2015 MICH. REHAB. CODE, SECTION 806.1).

ALL NEWLY INSTALLED ELECTRICAL EQUIPMENT AND WIRING RELATING TO WORK DONE IN ANY WORK AREA SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF NFPA 70 (2015 MICH. REHAB. CODE, SECTION 808.1).

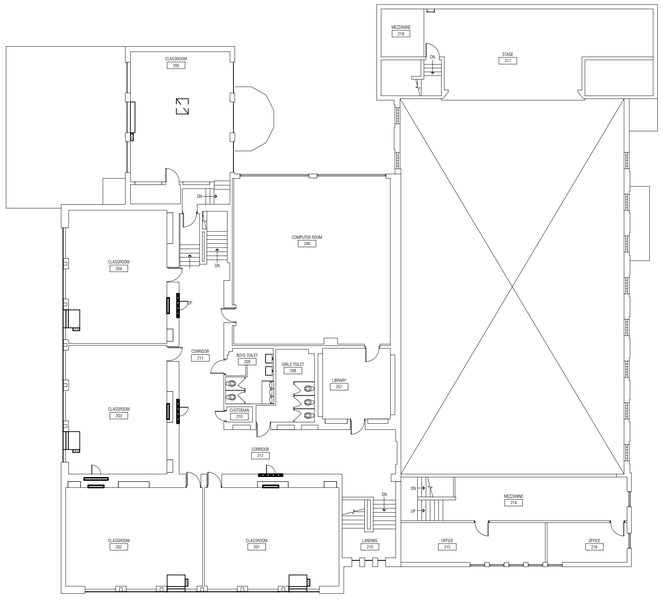
ALL RECONFIGURED SPACES INTENDED FOR OCCUPANCY IN ANY WORK AREA SHALL BE PROVIDED WITH NATURAL OR MECHANICAL VENTILATION IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE (2015 MICH. REHAB. CODE, SECTION 809.1).

IN MECHANICALLY VENTILATED SPACES, EXISTING MECHANICAL VENTILATION SYSTEMS THAT ARE ALTERED, RECONFIGURED, OR EXTENDED SHALL PROVIDE NOT LESS THAN 5 CUBIC FEET PER MINUTE PER PERSON OR OUTDOOR AIR AND NOT LESS THAN 15 CFM OF VENTILATION PER PERSON; OR NOT LESS THAN THE AMOUNT OF VENTILATION AIR DETERMINED BY THE INDOOR AIR QUALITY PROCEDURE OF ASHRAE 62 (2015 MICH. REHAB. CODE, SECTION 809.2).

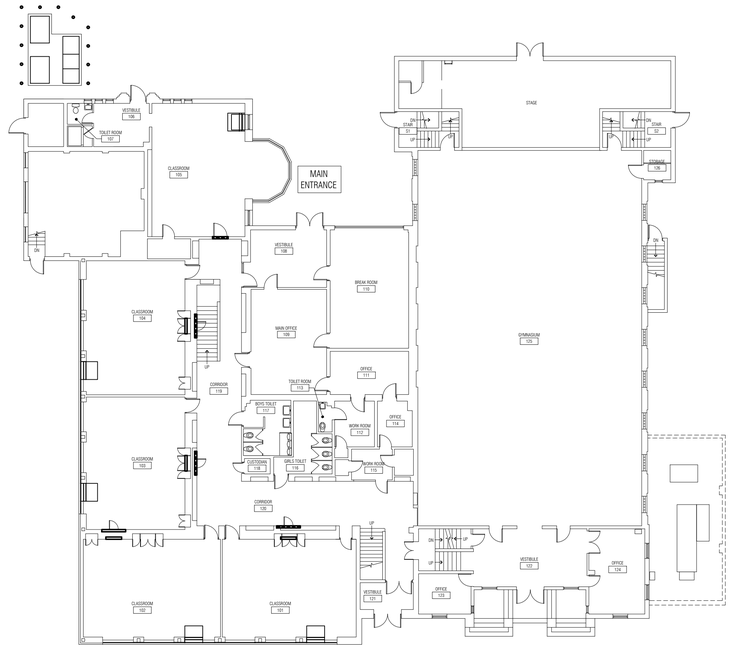
1 & 2 HR. BEARING & NON-BEARING MASONRY WALL



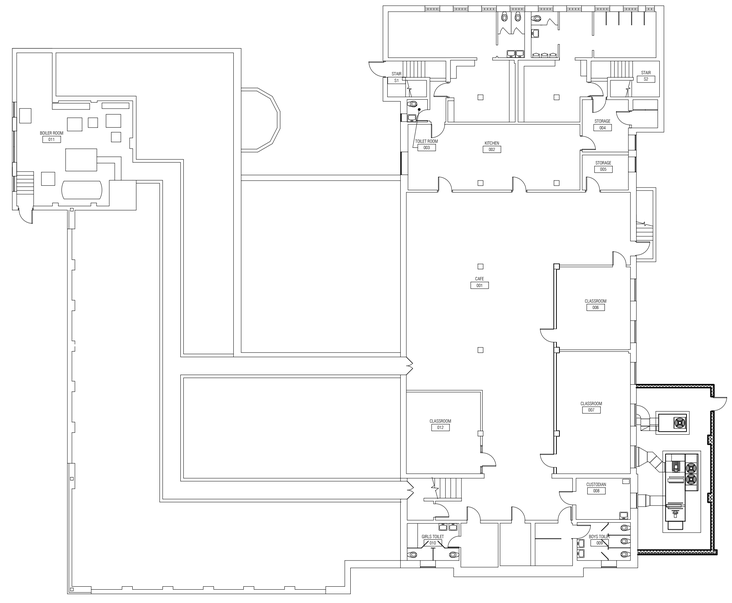
1. NORMAL WEIGHT 6" THICK (MAX. 1 HR.) OR 8" THICK (1 OR 2 HR.) CONCRETE BLOCKS WITH LIMESTONE AGGREGATE AND A MIN. EQUIVALENT THICKNESS OF 4" FOR (2 HR) AND 2.7" FOR (1 HR) MORTAR-BLOCKS LAID IN FULL BED OF MORTAR, NOM 3/8" THICK OF NOT LESS THAN 1/4 AND NOT MORE THAN 50 PERCENT HYDRATED LIME (BY CEMENT VOLUME) VERTICAL JOINTS STAGGERED.
2. LOOSE MASONRY FILL-IF ALL CORE SPACES ARE FILLED WITH LOOSE DRY EXPANDED SLAG , EXPANDED CLAY OR SHALE (ROTARY KILN PROCESS), WATER REPELANT VERMICULATE MASONRY FILL INSULATION OR SILICONE TREATED PARLITE LOOSE FILL INSULATION ADD 2 HR TO CLASSIFICATION. *BEARING THE UL CLASSIFICATION MARKING
3. ROOF AND/OR FLOOR DECKING SYSTEM MATERIAL.
4. STRUCTURAL STEEL FRAMING SYSTEM
5. CONRCRETE BLOCK WALL
6. CONCRETE BLOCK INFILL TIGHT TO UNDERSIDE OF DECK
7. UL APPROVED FIRESPRAY/COMPOUND BOTH SIDES OF WALL



N 3 Upper Level Floor Plan
1/16" = 1'-0"



N 2 Ground Level Floor Plan
1/16" = 1'-0"



N 1 Lower Level Floor Plan
1/16" = 1'-0"

LIFE SAFETY PLAN LEGEND

---------- INDICATES 1-HOUR FIRE-RATED ASSEMBLY WITH 20-MINUTE OPENING PROTECTIVE (SEE DETAIL THIS SHEET)

GENERAL LIFE SAFETY NOTES:

1. ALL FIRE WALLS, FIRE BARRIERS, FIRE PARTITIONS, SMOKE BARRIERS SHALL BE IDENTIFIED WITH SIGNS OR STENCILING (ON PORTIONS OF WALLS CONCEALED FROM VIEW) LETTERS MUST BE A MIN. 3" HEIGHT AND READ "FIRE AND/OR SMOKE BARRIER. PROTECT ALL OPENINGS" - SPACED AT 30'-0" O.C. AND WITHIN 15 FEET OF THE END OF EACH WALL.
2. THESE CODE ANALYSIS DRAWINGS (SHEET A0-02), NOTES, PLANS AND WALL IDENTIFICATION TYPES AND LOCATIONS ARE FOR FIRE RATINGS AND / OR SMOKE BARRIERS AS REQUIRED FOR LIFE SAFETY AND BUILDING CODE COMPLIANCE. REFER TO OTHER DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL CONSTRUCTION REQUIREMENTS.
3. ALL FIRE RATED WALLS OF ANY TYPE SHALL BE SEALED TIGHT TO THE ADJACENT BUILDING ELEMENT (FLOOR, ROOF, WALL, OR COLUMN) AND ALL PENETRATIONS SHALL BE PROPERLY SEALED WITH A UL-APPROVED FIRESTOPPING, JOINT PROTECTION, OR PERIMETER FIRE CONTAINMENT SYSTEM. REFER TO SPECIFICATION SECTIONS 078413 AND 078446. EACH BID CATEGORY CONTRACTOR IS RESPONSIBLE FOR SEALING THEIR OWN PENETRATIONS. SEALANT CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF APPROVED FIRE SEALANT JOINT SYSTEM WHERE FIRE-RATED WALL MEETS ADJACENT BUILDING ELEMENT (FLOOR, ROOF, WALL, OR COLUMN).

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CONSULTANT

KEY PLAN

PLAN NORTH

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

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50% Review	05/19/2022
Addendum #1	06/28/2022
Bidding - Construction	08/30/2022

DRAWN BY
DSB

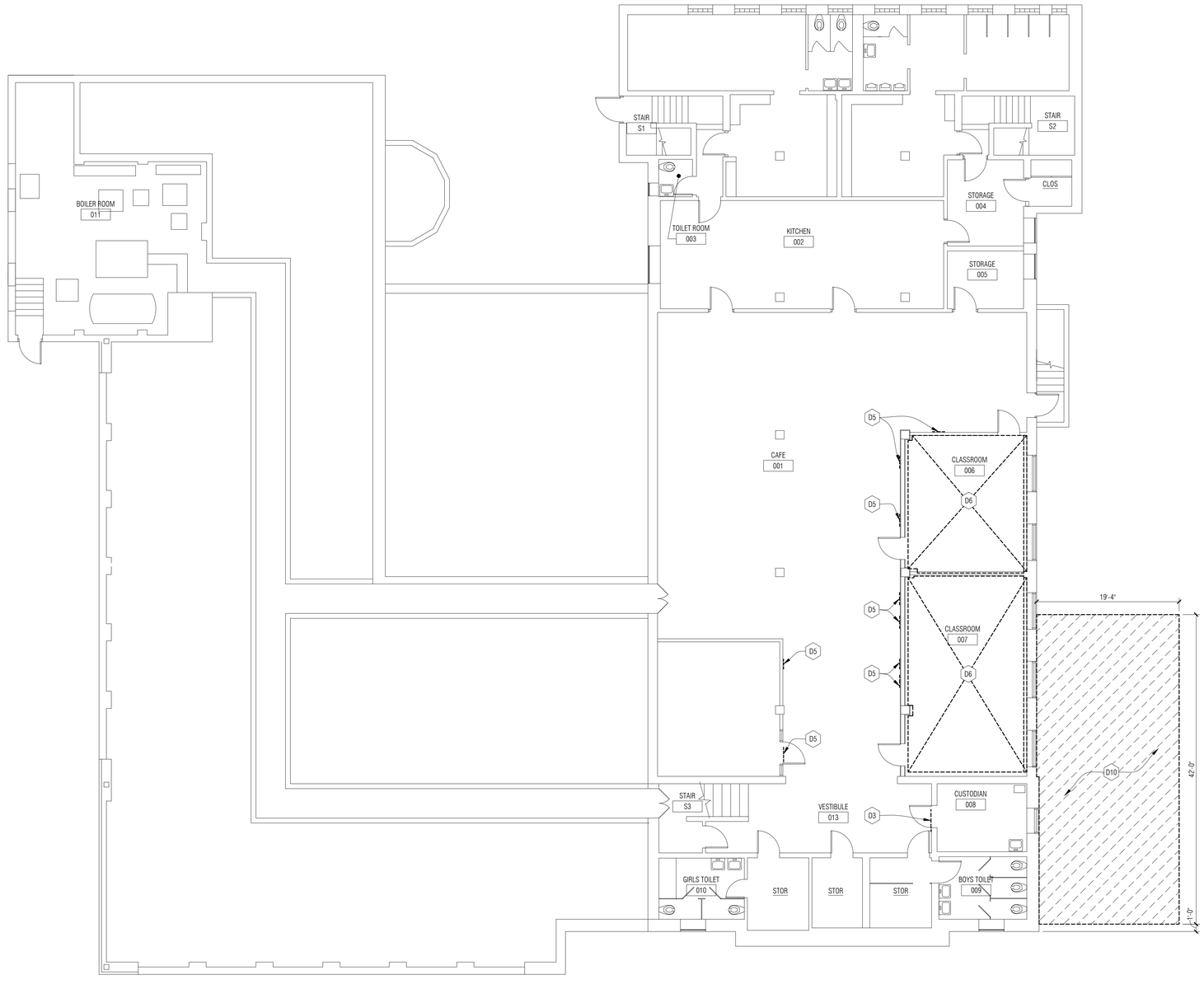
CHECKED BY
DRM

APPROVED BY
MAM

SHEET NAME

CODE AND LIFE SAFETY INFORMATION

SHEET NO.
A0-04



N TRUE NORTH

N PROJECT NORTH

1 Lower Level Demolition Plan
1/8" = 1'-0"

DEMOLITION GENERAL NOTES:

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B. NOTIFY ARCHITECT OF ANY DISCREPANCIES AND/OR CONFLICTS WITH FLOOR PLAN AND EXISTING BUILDING CONDITIONS PRIOR TO STARTING ANY WORK.

C. ALL DEMOLITION DRAWINGS & DETAILS ARE PROVIDED TO SHOW THE GENERAL SCOPE OF THE DEMOLITION WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PERFORM ALL DEMOLITION WORK NECESSARY TO ACCOMPLISH NEW WORK. THE DEMOLITION DRAWINGS AND DETAILS MAY NOTE TYPICAL ITEMS IN SOME AREAS, WHICH APPLY IN OTHER AREAS (AND ARE DESIGNATED WITH DASHED LINES) COORDINATE ALL DEMOLITION WORK WITH ALL ARCHITECTURAL, CIVIL, STRUCT, MECH AND ELEC DRAWINGS. THE CONTRACTOR IS RESPONSIBLE TO REFERENCE ALL DRAWINGS & SPECIFICATIONS TO CONFIRM EXTENT OF DEMOLITION WORK.

D. ALL CONSTRUCTION AND DEMOLITION MEANS, METHODS AND SAFETY PRECAUTIONS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR

E. DISPOSE OF ALL DEMOLITION MATERIALS LEGALLY OFF-SITE, U.O.N.

F. ASBESTOS AND OTHER HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER'S ABATEMENT CONTRACTOR PRIOR TO START OF CONSTRUCTION. IF ANY SUSPECTED HAZARDOUS MATERIAL IS ENCOUNTERED, STOP WORK IN THAT AREA AND IMMEDIATELY INFORM THE CONSTRUCTION MANAGER.

G. CONTRACTOR SHALL PROTECT EXISTING BUILDING ELEMENTS AND SITE FROM DAMAGE CAUSED BY CONTRACTOR AND SHALL REPAIR ALL DAMAGED AREAS (IDENTIFIED BY OWNER, ARCHITECT AND/OR CM) AT NO ADDITIONAL COST.

H. REMOVE ALL ITEMS PROJECTING FROM EXISTING WALLS OR FLOORS TO REMAIN (BLOCKING, SCREWS, FASTENERS, OBSOLETE PIPE & CONDUIT, MOUNTING PLATES, OBSOLETE FIXED EQUIPMENT, ETC). PATCH AND REPAIR TO RECEIVE NEW FINISH.

DEMO PLAN KEY NOTES:

D1 REMOVE RECESSED WALL LOUVER (+/- 40"x16") AND ALL ASSOCIATED COMPONENTS COMPLETE FROM CMU WALL (+/- 10'-0" A.F.F.).

D2 REMOVE EXISTING ACCESS DOOR (+/- 5'-4" x 3'-0"), FRAME AND ALL ASSOCIATED COMPONENTS COMPLETE (+/- 7'-0" A.F.F.).

D3 REMOVE PORTION OF CMU WALL FOR NEW DUCT PENETRATION - OPENING SHOULD INCLUDE REMOVAL OF CMU TO CONC STRUCTURE ABOVE.

D4 MODIFY EXISTING CMU AT REMOVED EXHAUST FAN TO ACCOMMODATE NEW EXHAUST FAN - COORDINATE W/ NEW MECH EQUIPMENT.

D5 REMOVE PORTION OF MODULAR WALL SYSTEM FOR MECHANICAL EQUIPMENT - COORDINATE VERTICAL OPENING LOCATION WITH CLASSROOM CEILING AND OPENING SIZE AND LOCATION W/ MECH.

D6 REMOVE ACT CEILING GRID SYSTEM COMPLETE - CEILING TILES AND CEILING MOUNTED DEVICES TO BE SALVAGED AND REUSED.

D7 REMOVE ACOUSTIC CEILING TREATMENT AS REQUIRED TO ACCOMMODATE NEW STRUCTURE.

D8 REMOVE ROOFING, INSULATION AND ROOF DECKING IN AREA BELOW ROOF CURB. COORDINATE W/ MECH AND STRUCT.

D9 REMOVE CEILING MOUNTED ACCESS DOOR - FRAME TO REMAIN.

D10 REMOVE PORTION OF EXISTING ASPHALT PARKING LOT PAVING AND CONC CURBS AS NEEDED FOR NEW MASONRY SCREEN WALL AND MECHANICAL EQUIPMENT PADS - PROTECT EXISTING DOWNSPOUTS AND DRAIN LINES.

D11 REMOVE EXISTING METAL PANEL FROM WINDOW FRAME FOR INSTALLATION OF NEW LOUVER - SALVAGE AND RETURN TO OWNER.

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CONSULTANT

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OWNER

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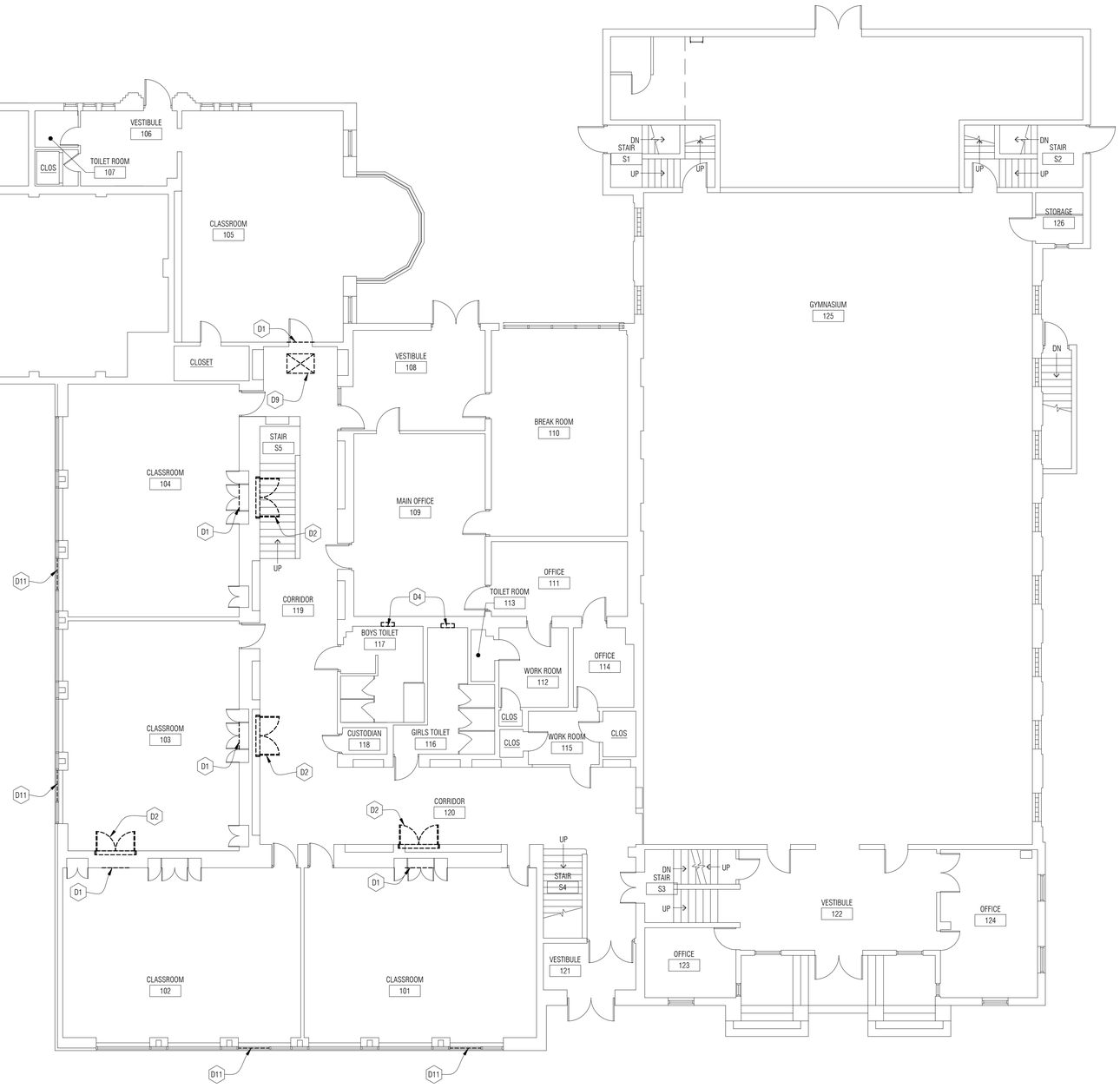
DRM

APPROVED BY
MAM

SHEET NAME

LOWER LEVEL
DEMOLITION PLAN

SHEET NO.
A1-01



N TRUE NORTH

N PROJECT NORTH

1 Ground Level Demolition Plan
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B. NOTIFY ARCHITECT OF ANY DISCREPANCIES AND/OR CONFLICTS WITH FLOOR PLAN AND EXISTING BUILDING CONDITIONS PRIOR TO STARTING ANY WORK.

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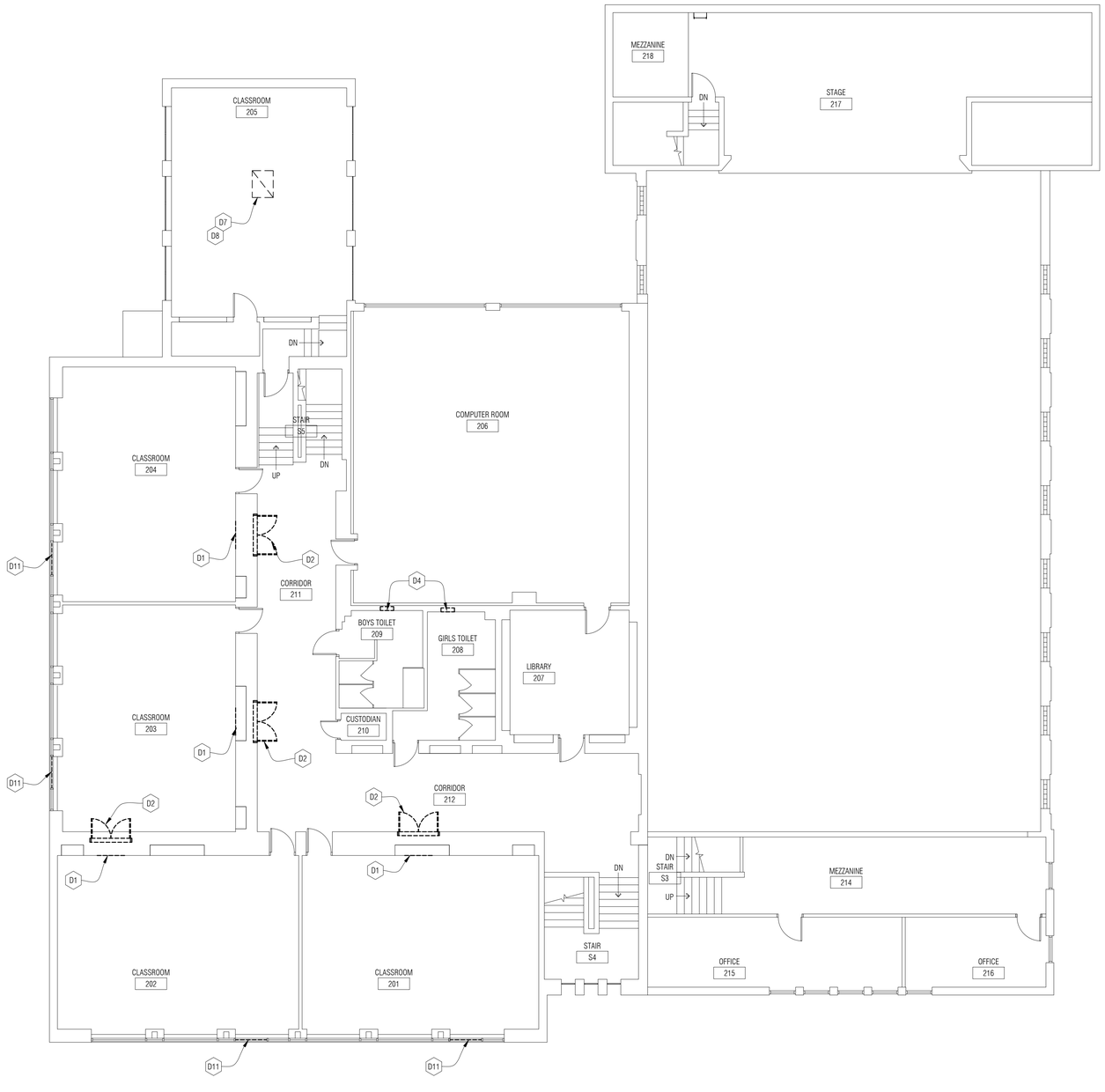
CHECKED BY
DRM

APPROVED BY
MAM

SHEET NAME

GROUND LEVEL
DEMOLITION PLAN

SHEET NO.
A1-02



N TRUE NORTH

N PROJECT NORTH

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A. DO NOT SCALE DRAWINGS. USE DIMENSIONS PROVIDED AND VERIFY IN FIELD. IF A CONFLICT IS ENCOUNTERED OR A REQUIRED DIMENSION IS NOT PROVIDED, REQUEST A CLARIFICATION FROM THE ARCHITECT.

B. NOTIFY ARCHITECT OF ANY DISCREPANCIES AND/OR CONFLICTS WITH FLOOR PLAN AND EXISTING BUILDING CONDITIONS PRIOR TO STARTING ANY WORK.

C. ALL DEMOLITION DRAWINGS & DETAILS ARE PROVIDED TO SHOW THE GENERAL SCOPE OF THE DEMOLITION WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PERFORM ALL DEMOLITION WORK NECESSARY TO ACCOMPLISH NEW WORK. THE DEMOLITION DRAWINGS AND DETAILS MAY NOTE TYPICAL ITEMS IN SOME AREAS, WHICH APPLY IN OTHER AREAS (AND ARE DESIGNATED WITH DASHED LINES) COORDINATE ALL DEMOLITION WORK WITH ALL ARCHITECTURAL, CIVIL, STRUCT, MECH AND ELEC DRAWINGS. THE CONTRACTOR IS RESPONSIBLE TO REFERENCE ALL DRAWINGS & SPECIFICATIONS TO CONFIRM EXTENT OF DEMOLITION WORK.

D. ALL CONSTRUCTION AND DEMOLITION MEANS, METHODS AND SAFETY PRECAUTIONS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR

E. DISPOSE OF ALL DEMOLITION MATERIALS LEGALLY OFF-SITE, U.O.N.

F. ASBESTOS AND OTHER HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER'S ABATEMENT CONTRACTOR PRIOR TO START OF CONSTRUCTION. IF ANY SUSPECTED HAZARDOUS MATERIAL IS ENCOUNTERED, STOP WORK IN THAT AREA AND IMMEDIATELY INFORM THE CONSTRUCTION MANAGER.

G. CONTRACTOR SHALL PROTECT EXISTING BUILDING ELEMENTS AND SITE FROM DAMAGE CAUSED BY CONTRACTOR AND SHALL REPAIR ALL DAMAGED AREAS (IDENTIFIED BY OWNER, ARCHITECT AND/OR CM) AT NO ADDITIONAL COST.

H. REMOVE ALL ITEMS PROJECTING FROM EXISTING WALLS OR FLOORS TO REMAIN (BLOCKING, SCREWS, FASTENERS, OBSOLETE PIPE & CONDUIT, MOUNTING PLATES, OBSOLETE FIXED EQUIPMENT, ETC). PATCH AND REPAIR TO RECEIVE NEW FINISH.

DEMO PLAN KEY NOTES:

D1 REMOVE RECESSED WALL LOUVER (+/- 40"x16") AND ALL ASSOCIATED COMPONENTS COMPLETE FROM CMU WALL (+/- 10'-0" A.F.F.).

D2 REMOVE EXISTING ACCESS DOOR (+/- 5'-4" x 3'-0"), FRAME AND ALL ASSOCIATED COMPONENTS COMPLETE (+/- 7'-0" A.F.F.).

D3 REMOVE PORTION OF CMU WALL FOR NEW DUCT PENETRATION - OPENING SHOULD INCLUDE REMOVAL OF CMU TO CONC STRUCTURE ABOVE.

D4 MODIFY EXISTING CMU AT REMOVED EXHAUST FAN TO ACCOMMODATE NEW EXHAUST FAN - COORDINATE W/ NEW MECH EQUIPMENT.

D5 REMOVE PORTION OF MODULAR WALL SYSTEM FOR MECHANICAL EQUIPMENT - COORDINATE VERTICAL OPENING LOCATION WITH CLASSROOM CEILING AND OPENING SIZE AND LOCATION W/ MECH.

D6 REMOVE ACT CEILING GRID SYSTEM COMPLETE - CEILING TILES AND CEILING MOUNTED DEVICES TO BE SALVAGED AND REUSED.

D7 REMOVE ACOUSTIC CEILING TREATMENT AS REQUIRED TO ACCOMMODATE NEW STRUCTURE.

D8 REMOVE ROOFING, INSULATION AND ROOF DECKING IN AREA BELOW ROOF CURB. COORDINATE W/ MECH AND STRUCT.

D9 REMOVE CEILING MOUNTED ACCESS DOOR - FRAME TO REMAIN.

D10 REMOVE PORTION OF EXISTING ASPHALT PARKING LOT PAVING AND CONC CURBS AS NEEDED FOR NEW MASONRY SCREEN WALL AND MECHANICAL EQUIPMENT PADS - PROTECT EXISTING DOWNSPOUTS AND DRAIN LINES.

D11 REMOVE EXISTING METAL PANEL FROM WINDOW FRAME FOR INSTALLATION OF NEW LOUVER - SALVAGE AND RETURN TO OWNER.

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CONSULTANT

KEY PLAN

PLAN NORTH

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
90% Review	06/24/2022
Bidding - Construction	08/30/2022

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DRM

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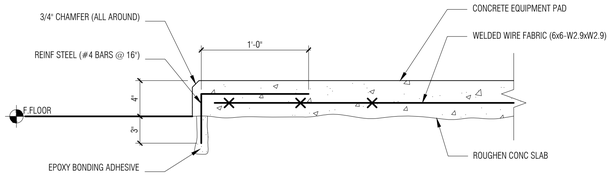
MAM

SHEET NAME

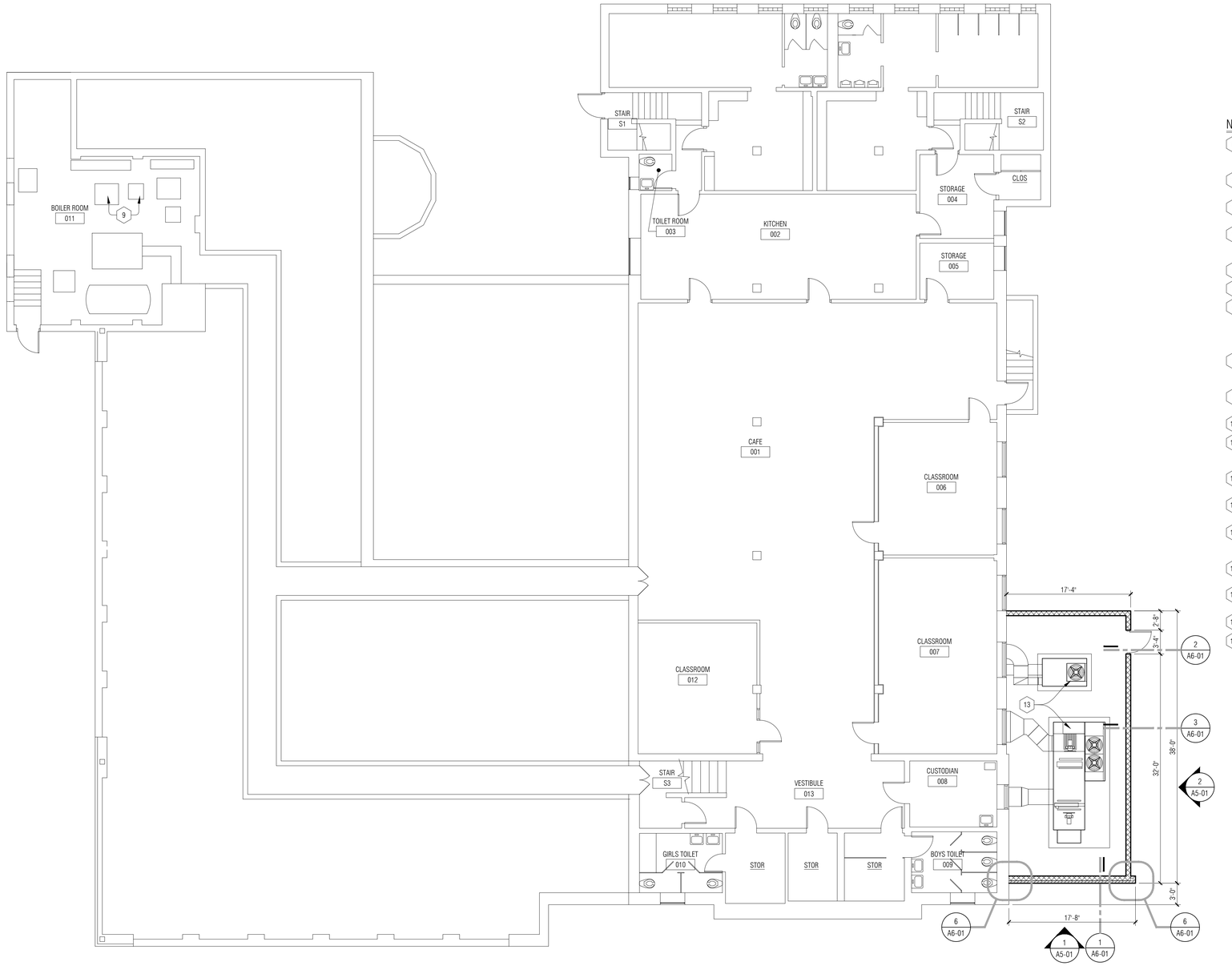
UPPER LEVEL
DEMOLITION PLAN

SHEET NO.
A1-03



NOTE: COORDINATE SIZE AND LOCATION OF CONCRETE EQUIPMENT PADS INCLUDING ANCHORING DEVICES W/ INFORMATION PROVIDED BY THE APPROPRIATE EQUIPMENT MFR

2 / A3-01 Concrete Equipment Pad
1 1/2" = 1'-0"



N TRUE NORTH

N PROJECT NORTH

1 Lower Level Floor Plan
1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES:

A. COORDINATE SIZE AND LOCATION OF ALL DUCT, SHAFT AND LOUVER OPENINGS IN WALLS AND FLOORS WITH MECHANICAL - REFER TO STRUCTURAL FOR ALL REQUIRED LINTELS.

B. DO NOT SCALE DRAWINGS. USE DIMENSIONS PROVIDED. IF A CONFLICT IS ENCOUNTERED OR A REQUIRED DIMENSION IS NOT PROVIDED, REQUEST A CLARIFICATION FROM THE ARCHITECT.

C. REFER TO STRUCTURAL FOR ALL BEARING WALLS, COLUMNS, LINTELS, ETC.

D. REFER TO ARCHITECTURAL AND STRUCTURAL SECTIONS AND DETAILS FOR ALL EXTERIOR WALL CONSTRUCTION.

E. PROTECT EXISTING ROOF MEMBRANE DURING CONSTRUCTION.

NEW WORK KEY NOTES:

1. DASHED LINE OF NEW PIPING ROUTE - REFER TO INTERIOR ELEVATIONS, COORDINATE W/ MECH - SEAL ALL WALL PENETRATIONS.
2. INFILL OPENING WITH 6" CMU , VERIFY MASONRY THICKNESS IN FIELD.
3. INFILL OPENING WITH 4" CMU, VERIFY MASONRY THICKNESS IN FIELD - COORDINATE W/ NEW ACCESS DOOR LOCATION.
4. NEW 24" x 24" FLUSH METAL ACCESS PANEL W/ FLUSH SCREWDRIVER OPERATED CAM LOCK - LOCATE BELOW EXISTING LINTEL, COORDINATE HORIZONTAL LOCATION W/ MASONRY INFILL.
5. EXISTING LOUVER TO REMAIN.
6. MECHANICAL EQUIPMENT - REFER TO MECH.
7. LOUVER TO BE GLAZED INTO EXISTING STOREFRONT FRAME W/ GLAZING ADAPTER - REFER TO MECH & COORD W/ EXISTING WINDOW FRAME (+/- 4'-0" X 5'-0") - PROVIDE MATCHING METAL INSULATED BLANK OFF PANEL WHERE VUV EXTENSION DOES NOT COVER LOUVER.
8. NEW 18" x 18" FLUSH METAL ACCESS PANEL W/ FLUSH SCREWDRIVER OPERATED CAM LOCK IN GYPSUM WALL - PAINT TO MATCH ADJACENT WALL.
9. NEW CONC HOUSE KEEPING PAD ON EXISTING SLAB - REFER TO DETAIL 2/A3-01 - COORD SIZE W/ MECH.
10. PATCH, REPAIR & PAINT WALL @ REMOVED MECH EQUIPMENT.
11. NEW 24" x 24" GRILL IN EXISTING 24" x 48" ACOUSTIC CEILING SYSTEM - MODIFY GRID / TILES AS REQUIRED TO MATCH EXISTING ADJACENT.
12. PIPES TO BE CORED THROUGH FLOOR BY ABATEMENT CONTRACTOR.
13. NEW HVAC EQUIPMENT ON NEW CONCRETE PADS - REFER TO STRUCTURAL DRAWINGS FOR CONC REINF INFO.
14. NEW ELECTRICAL TRANSFORMERS AND RELATED ELECTRICAL EQUIPMENT ON NEW CONCRETE PADS (THICKNESS AND REINFORCING AS REQUIRED BY DTE) - COORDINATE W/ ELEC.
15. NEW CONCRETE BOLLARDS - MAX SPACING 60" O.C. - SEE DETAIL A3-02 - PAINT TRAFFIC YELLOW.
16. COORDINATE LOCATION OF NEW CONDENSER UNIT W/ MECH - PAINT CONDUIT TO MATCH EXISTING BRICK.
17. REFER TO SHEET A3-01 FOR NEW CONSTRUCTION.
18. CONDUIT RUNS FOR VUV UNITS WILL BE EXPOSED AND PAINTED TO MATCH ADJACENT SURFACES - CONDUIT TO BE RUN CLOSE TO CEILINGS AND STRUCTURES - FINAL PATH TO BE COORDINATED W/ ARCHITECT - REFER TO ELEC.

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CONSULTANT

KEY PLAN

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OWNER

Hamtramck
Public Schools

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Phase 2
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Bidding - Construction	08/30/2022

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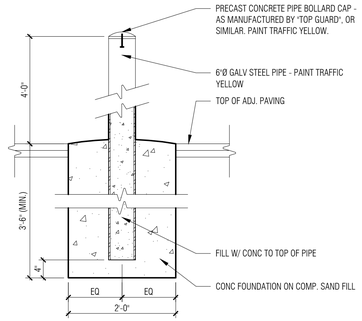
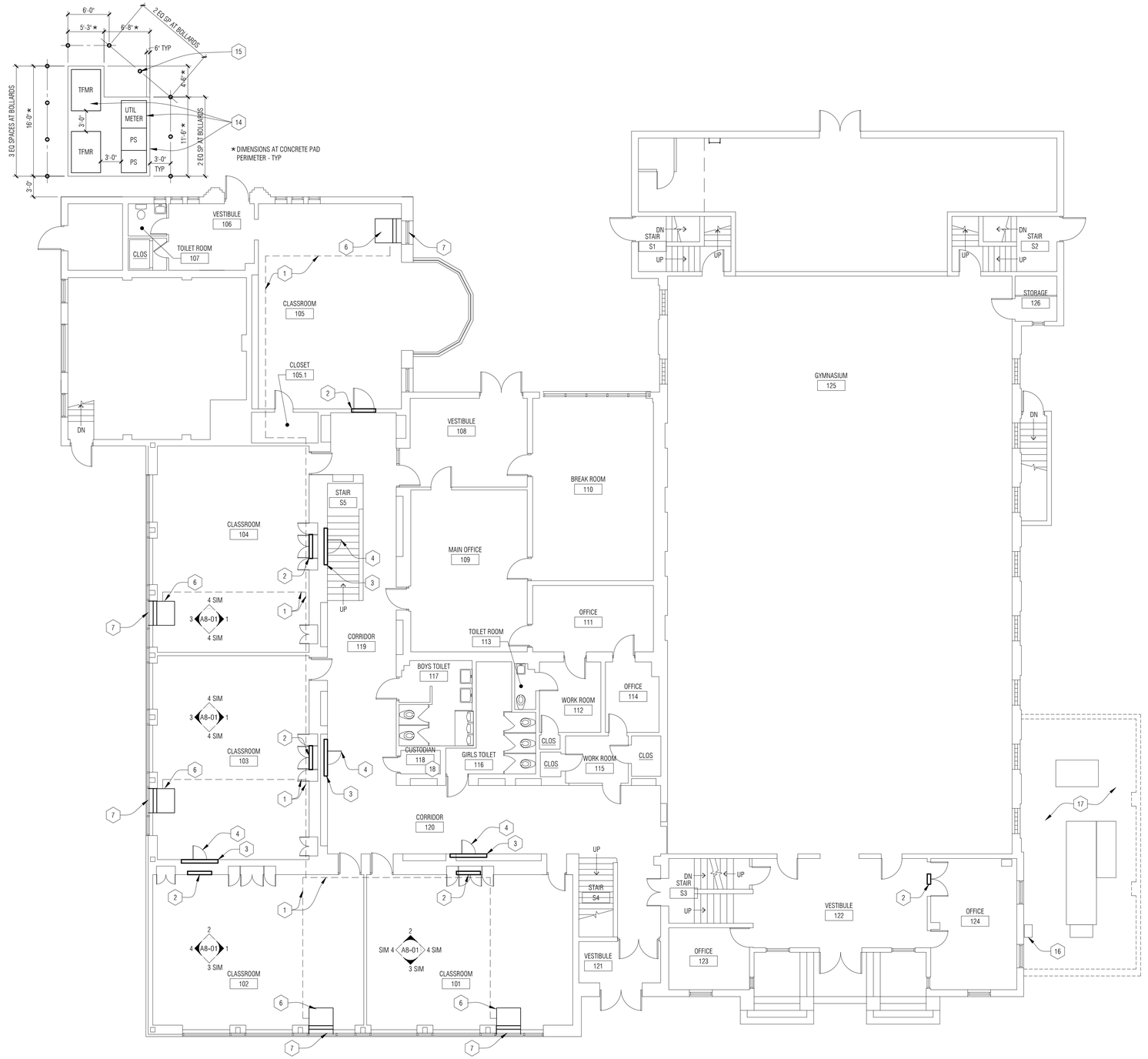
SHEET NAME

LOWER LEVEL
FLOOR PLAN

SHEET NO.
A3-01



2 / A3-02 Typ. Pipe Bollard Detail
3/4" = 1'-0"



N TRUE NORTH N PROJECT NORTH

1 Ground Level Floor Plan
1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES:

A. COORDINATE SIZE AND LOCATION OF ALL DUCT, SHAFT AND LOUVER OPENINGS IN WALLS AND FLOORS WITH MECHANICAL - REFER TO STRUCTURAL FOR ALL REQUIRED LINTELS.

B. DO NOT SCALE DRAWINGS. USE DIMENSIONS PROVIDED. IF A CONFLICT IS ENCOUNTERED OR A REQUIRED DIMENSION IS NOT PROVIDED, REQUEST A CLARIFICATION FROM THE ARCHITECT.

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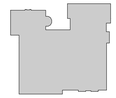
KEY PLAN



PLAN NORTH

OWNER

Hamtramck
Public Schools

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Phase 2
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Bidding - Construction	08/30/2022

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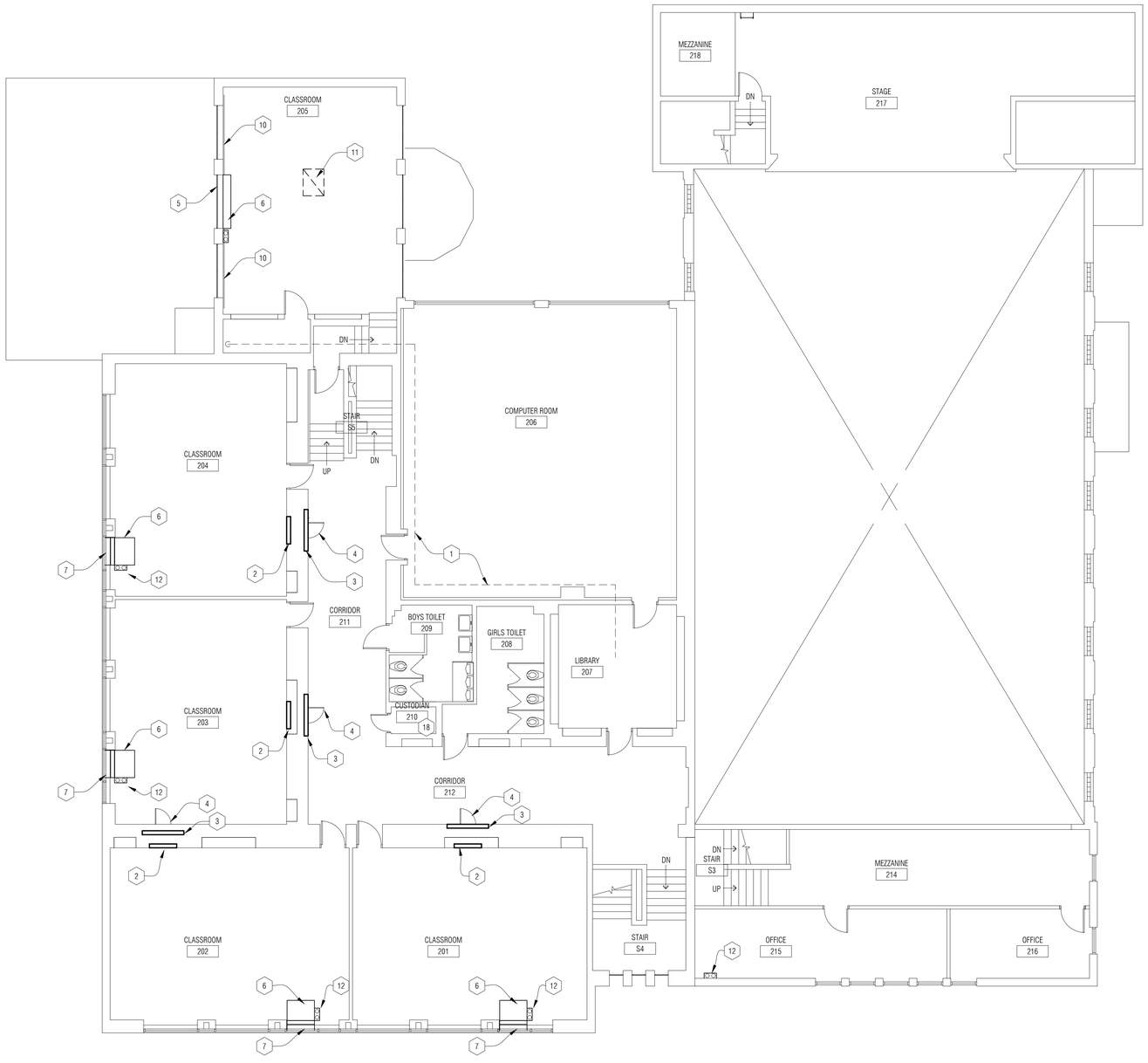
CHECKED BY
DRM

APPROVED BY
MAM

SHEET NAME

GROUND LEVEL
FLOOR PLAN

SHEET NO.
A3-02



N TRUE NORTH

N PROJECT NORTH

1 Upper Level Floor Plan
1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES:

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CONSULTANT

KEY PLAN

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OWNER

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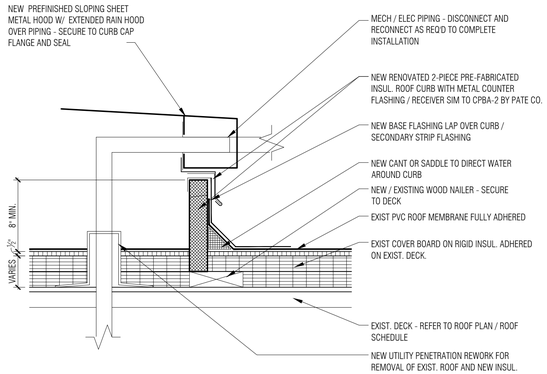
DRM

APPROVED BY
MAM

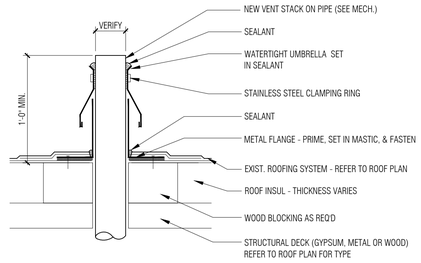
SHEET NAME

UPPER LEVEL
FLOOR PLAN

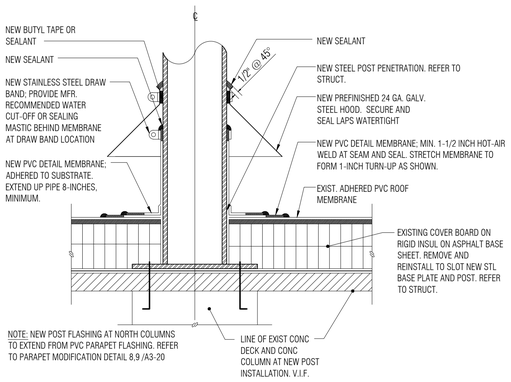
SHEET NO.
A3-03



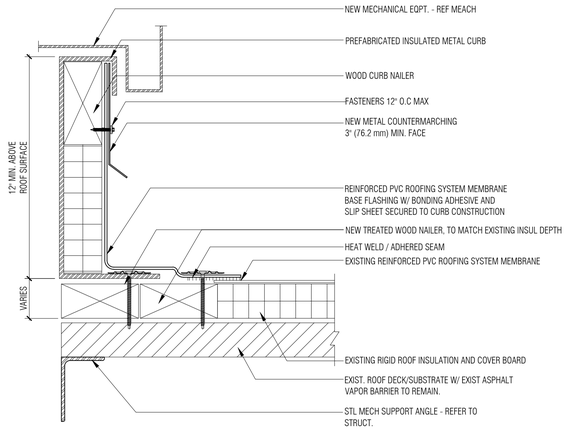
7 / A3-20 Detail at Utility Penetration / Hood
1-1/2" = 1'-0"



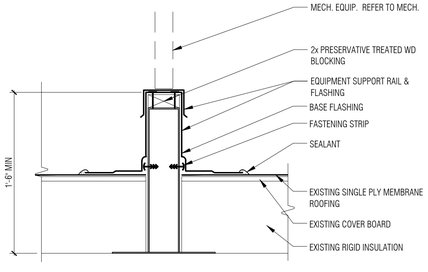
4 Typical Detail @ Roof Pipe / Conduit Penetration
1-1/2" = 1'-0"



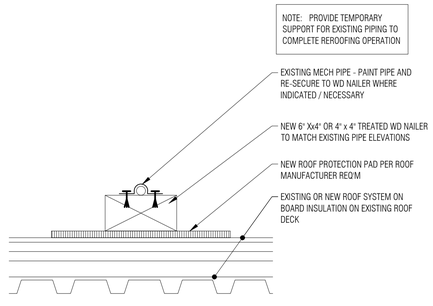
6 / A3-20 Typical Pipe / Post Pentrations
N.T.S.



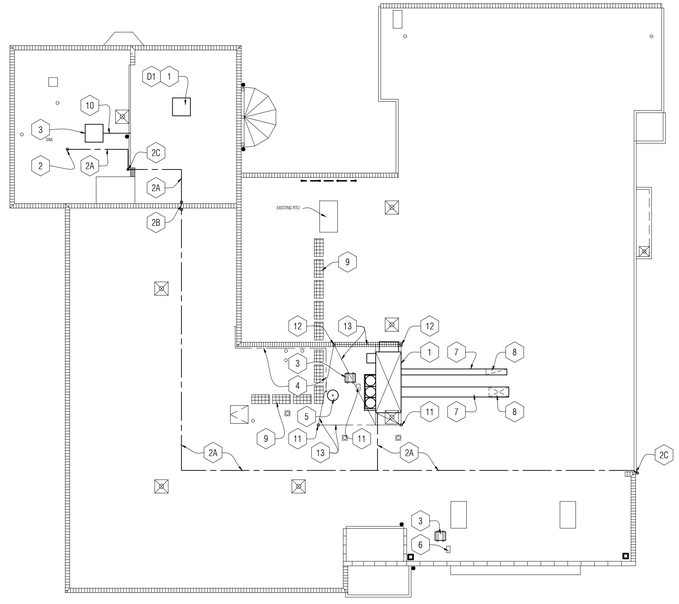
3 Termination at Roof Top Equipment
N.T.S



5 Equipment Support Rail
1-1/2" = 1'-0"



2 Typical Conduit / Piping Support
N.T.S.



N TRUE NORTH
N PROJECT NORTH
1 Roof Plan
1/16" = 1'-0"

ROOF PLAN GENERAL NOTES:

A. NEW WORK DRAWINGS ARE PROVIDED TO SHOW THE GENERAL SCOPE OF NEW WORK INSTALLATION BUT DO NOT INDICATE ALL INCIDENTAL WORK ITEMS. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD VERIFY EXISTING CONDITIONS AND INCLUDE ALL INCIDENTAL WORK ITEMS TO COMPLETE THE ROOF REPAIR/ INSTALLATION AS DEFINED BY THE CONSTRUCTION DOCUMENTS.

B. ALL CONSTRUCTION AND DEMOLITION THE MEANS, METHODS AND SAFETY PRECAUTIONS SHALL BE SOLE RESPONSIBILITY OF THE CONTRACTOR.

C. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXISTING CONDITIONS AND ROOF ACCESS PRIOR TO SUBMITTING BIDS.

D. EXISTING PVC ROOF IS UNDER WARRANTY. ALL ROOF MODIFICATIONS FOR STRUCT./MECH./ELEC. UTILITY AND EQUIPMENT INSTALL SHALL MEET EXISTING ROOF MANUFACTURE REQUIREMENTS TO MAINTAIN EXISTING WARRANTY.

E. REFER TO AND COORD NEW WORK W/ MULTIPLE M/E/P PLANS. NOTE FULL M/E/P SCOPE ILLUSTRATED ON MULTIPLE ROOF PLANS.

DEMOLITION ROOF PLAN KEY NOTES:

D1 REMOVE EXISTING PVC ROOF MEMBRANE, INSULATION AND DECK. COORDINATE OPENING SIZE & LOCATION WITH MECHANICAL. PROVIDE TEMPORARY BRACING FOR ROOF CONSTRUCTION.

ROOF PLAN KEY NOTES:

1 NEW MECHANICAL EQUIPMENT ON NEW CURB - NEW STRUCTURE TO SUPPORT NEW UNIT TO INTERFACE WITH EXISTING FRAMING - COORDINATE OPENING SIZE WITH MECHANICAL AND STRUCTURAL STEEL REINFORCEMENT WITH STRUCTURAL.

2A NEW GAS LINE OVER ROOF W/ PIPE SUPP. BY MECH. TRADES. PAINT GAS LINE SAFETY YELLOW AT HORZ. INSTALLATION. COORD W/ MECH TRADES.

2B ROUTE NEW GAS LINE OVER EXISTING ROOF PARAPET.

2C NEW VERT. GAS PIPE INSTALLATION. PROVIDE SUPPORT BRACKETS AND ANCHORING BY MECH TRADES. COORD PIPE PLACEMENT ADJACENT TO ROOF CONDUCTOR AND AROUND ROOF PARAPET TO CONCEAL INSTALLATION AS MUCH AS POSSIBLE. PAINT VERT. PIPE AND BRACKETS TO MATCH BRICK MASONRY. VERIFY COLOR W/ ARCH.

3 NEW MECH UNIT ON EQPT SUPPORT RAIL ON EXISTING CONC DECK - COORD. SIZE W/ MECH. COORD LOCATION W/ EXISTING ROOF EQUIPMENT, PIPING, ETC.

4 EXISTING ELEC. CONDUIT OVER ROOF. COORD NEW MECH/ELEC EQUIPMENT AND PENETRATIONS TO AVOID INTERFERENCE.

5 NEW MECH. INTAKE HOOD ON EXISTING ROOF CURB. PROVIDE NEW SHEET METAL TRANSITION. V.I.F. COORD W/ MECH.

6 NEW MECH/ELEC UTILITY PENETRATION THRU ROOF AND STRUCTURE. PROVIDE NEW RENOV CURB AND HOOD PER DETAIL.

7 NEW DUCT AND DUCT SUPPORT OVER ROOF. REFER TO MECH. PROVIDE NEW ROOF FLASHING AT DUCT SUPPORTS PER DETAIL 4/A3-20. COORD W/ MECH TRADES.

8 NEW DUCT PENETRATION THRU ROOF. PROVIDE NEW CURB AND FLSHING PER DETAIL 3/A3-20. COORD W/ MECH. PROVIDE NEW DECK OPENING SUPPORT PER STRUCT.

9 NEW COMPATIBLE ROOF WALK PAD FROM ROOF ACCESS TO EXISTING RTU. COORD PATH W/ EXISTING AND NEW EQUIPMENT.

10 NEW MECH/ELEC UTILITY TO RTU. RUN ACROSS ROOF AND THRU ADJ. WALL CONSTR. PENETRATE AND SEAL WALL ABOVE BASE FLASHING. COORD W/ MECH./ELEC.

11 NEW STRUCTURAL STEEL POST THRU ROOF CONSTRUCTION. FLASH POST PER DETAIL 6/A3-20.

12 NEW STEEL POST SET THRU EXISTING MASONRY PARAPET CONSTR TO CONC ROOF ELEV. REFER TO DETAILS 8 & 9/A3-20.

13 LINE OF NEW GALV. STRUCTURAL STEEL SUPPORT BEAMS OVER ROOF. REFER TO STRUCT.

PARTNERS

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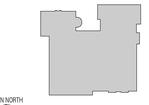
KEY PLAN



OWNER

Hamtramck Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
90% Review	06/24/2022
Bidding - Construction	08/30/2022

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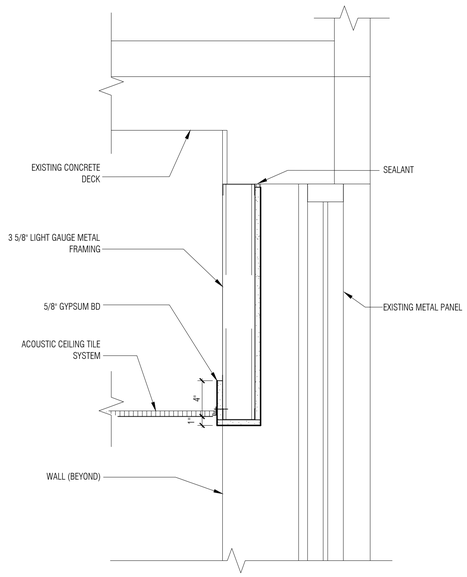
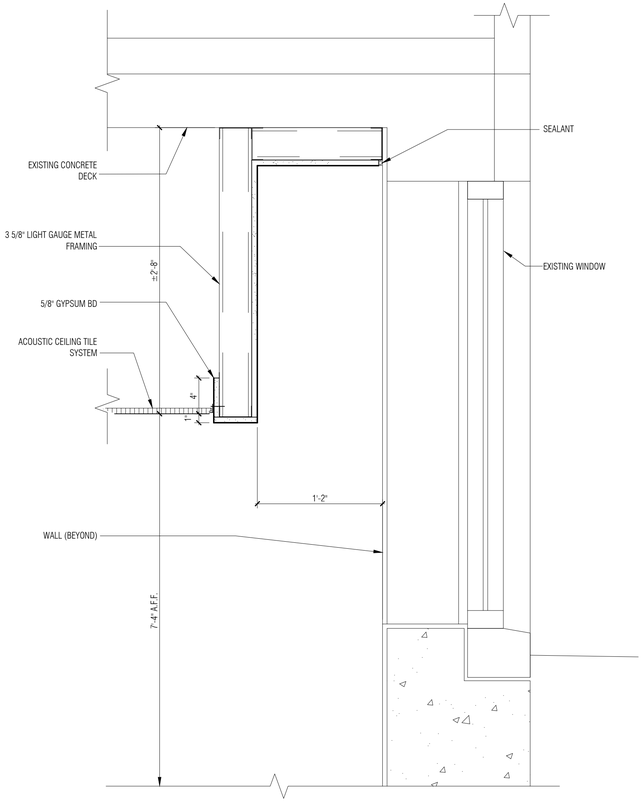
DEMOLITION AND NEW WORK ROOF PLAN

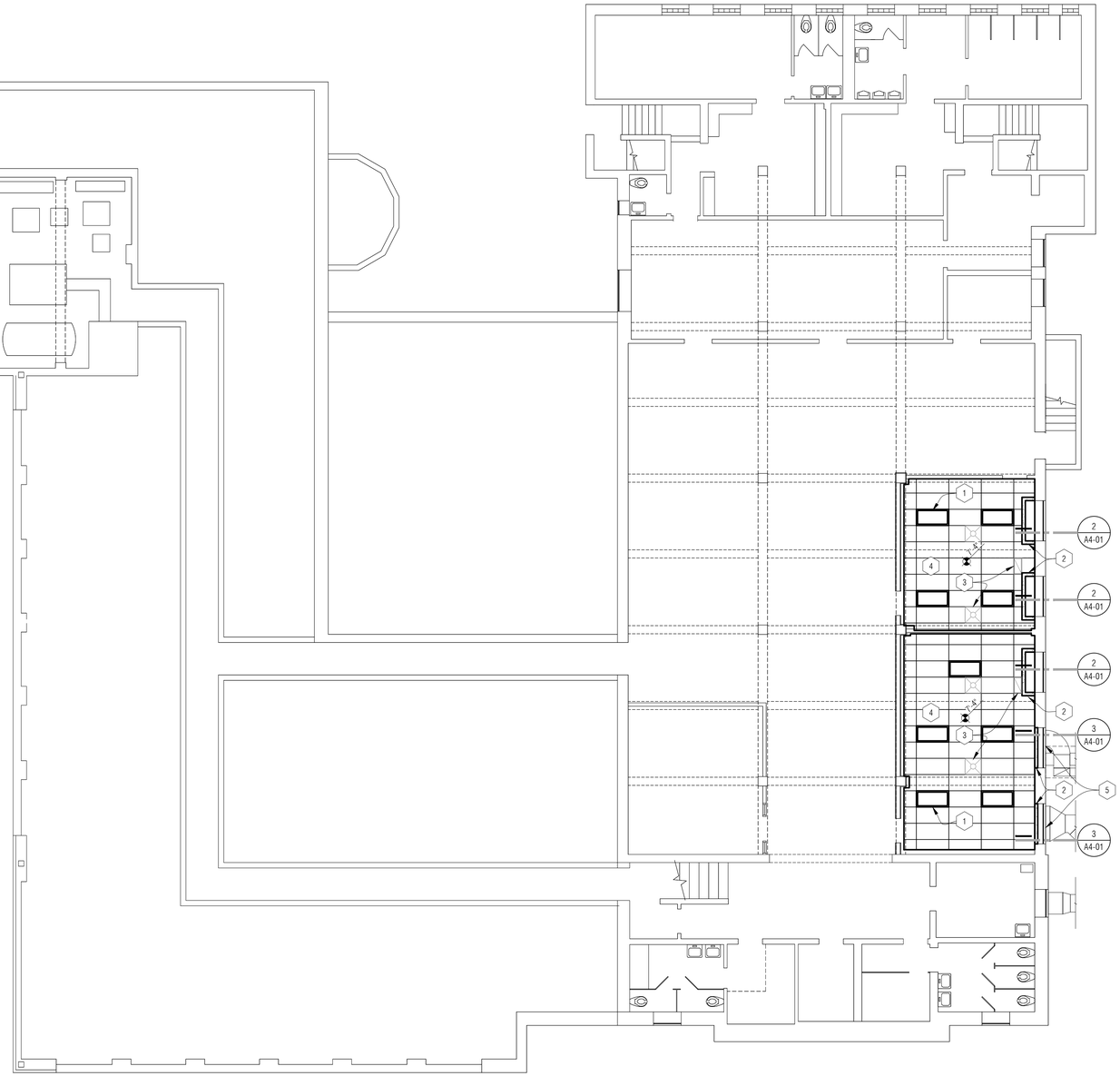
SHEET NO.
A3-20



3 A4-01 Detail @ Window Header
1-1/2" = 1'-0"



2 A4-01 Detail @ Window Soffit
1-1/2" = 1'-0"



N TRUE NORTH

N PROJECT NORTH

1 Lower Level Floor Plan
1/8" = 1'-0"

REFLECTED CEILING PLAN - KEY NOTES:

1. NEW 2X4 RECESSED LIGHT FIXTURES -REFER TO ELEC. - COORDINATE LOCATIONS W/ NEW DUCT WORK.
2. NEW GYP BD HEADER AT WINDOW WELL - REFER TO DETAILS, COORDINATE W/ NEW CEILING HEIGHT.
3. NEW MECHANICAL DUCT WORK - DUCTS TO BE RUN TIGHT TO EXISTING CONC BEAMS.
4. NEW GRID AND CEILING TILE (ACT-1) - REFER TO SPECIFICATIONS. GRID TO BE INSTALLED AS TO ALLOW DUCTS TO ALIGN IN GRID AND WORK WITH EXISTING STRUCTURE ABOVE - COORDINATE WITH MECH AND ARCHITECT.
5. NEW DUCT THROUGH EXISTING METAL PANEL IN STOREFRONT FRAME - SEAL WEATHER TIGHT.

Ceiling Symbols Legend

	5/8" GYP HEADER - REFER TO DETAIL
	2x4 RECESSED FIXTURE - REFER TO ELEC
	SUPPLY AIR DIFFUSER - REFER TO MECH
	RETURN AIR GRILLE - REFER TO MECH

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KEY PLAN

PLAN NORTH

OWNER

Hamtramck
Public Schools

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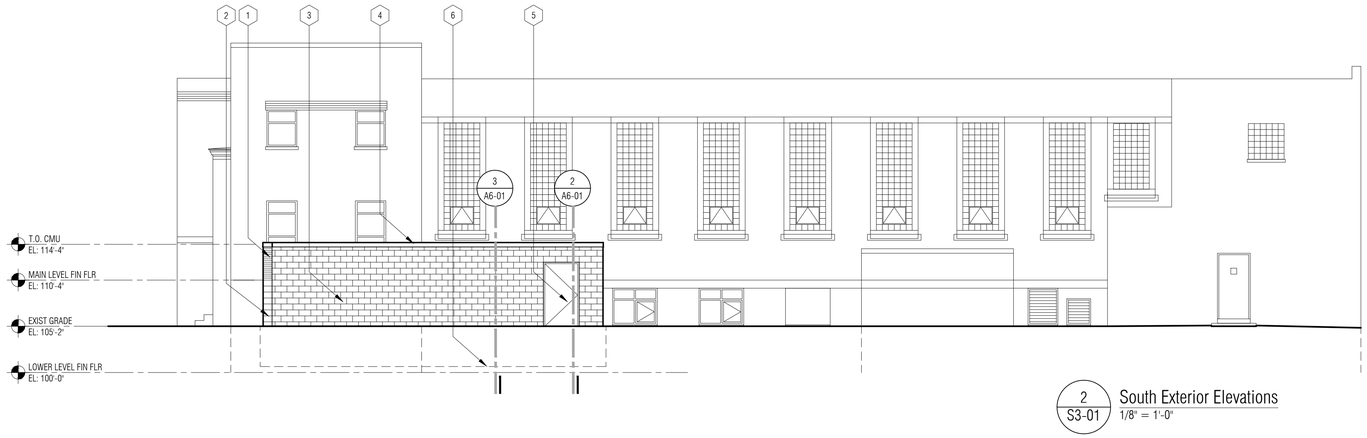
LOWER LEVEL
REFLECTED
CEILING PLAN

SHEET NO.
A4-01



2 / S3-01 South Exterior Elevations
1/8" = 1'-0"

1 / A3-01 West Exterior Elevation
1/8" = 1'-0"

EXTERIOR ELEVATIONS GENERAL NOTES:

A. REFER TO MATERIAL FINISH / COLOR SCHEDULE (SPEC SECTION 000200)

B. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING AND UNDERSTANDING EXISTING CONDITIONS.

C. REFER TO SECTION DETAILS FOR CAST STONE SILL PROFILES

ELEVATION KEY NOTES:

1. RUNNING BOND FACE BRICK.
2. 4" CMU FACE. TOP OF BLOCK TO ALIGN WITH TOP OF STONE BASE ON EXISTING BUILDING.
3. 8" SINGLE WYTHE CMU WALL. REFER TO STRUCT FOR REINF INFO.
4. PRE-FINISHED METAL COPING.
5. 3'-8" x 7'-0" FRP DOOR AND ALUMINUM FRAME - REFER TO SPECIFICATIONS, HARDWARE SET #1.
6. LINE OF NEW SCREEN WALL FOOTING. REFER TO STRUCT.
7. 2" EXPANSION JOINT. REFER TO PLAN DETAILS FOR MORE INFO.

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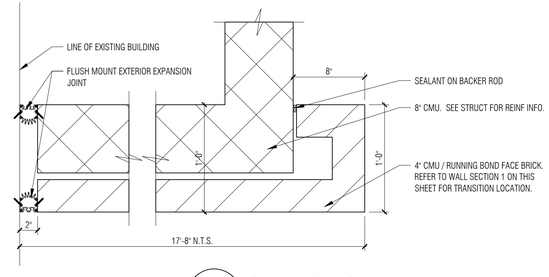
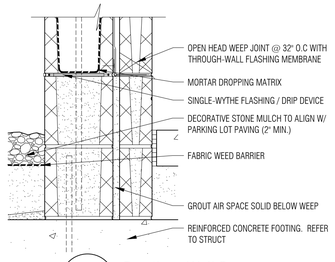
EXTERIOR
ELEVATIONS

SHEET NO.
A5-01



6 A6-01 **Detail @ Wall Corner**
1 1/2" = 1'-0"

5 A6-01 **Detail @ Stone Cap**
1 1/2" = 1'-0"



4 A6-01 **Detail @ Wall Base**
1 1/2" = 1'-0"

3 A3-01 **Wall Section**
3/4" = 1'-0"

REFER TO SECTION 1 THIS SHEET FOR SIMILAR NOTES AND DIMENSIONS

2 A3-01 **Wall Section**
3/4" = 1'-0"

REFER TO SECTION 1 THIS SHEET FOR SIMILAR NOTES AND DIMENSIONS

1 A3-01 **Wall Section**
3/4" = 1'-0"

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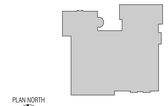
KEY PLAN



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SHEET NAME

WALL SECTIONS

SHEET NO.
A6-01

INTERIOR ELEVATION GENERAL NOTES:

A. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING AND UNDERSTANDING EXISTING CONDITIONS PRIOR TO STARTING WORK.

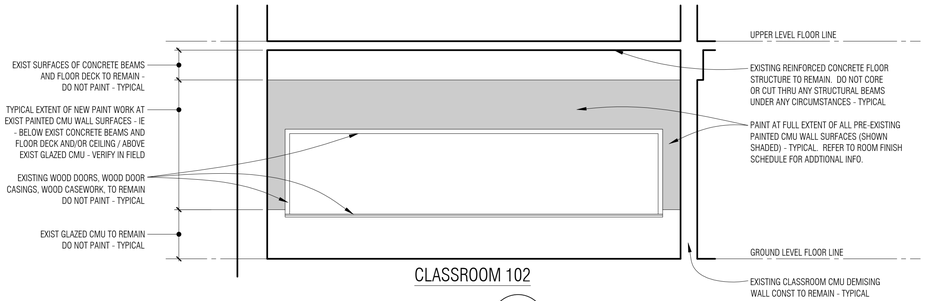
B. DO NOT SCALE DRAWINGS. USE DIMENSIONS PROVIDED AND VERIFY IN FIELD. IF A CONFLICT IS ENCOUNTERED OR A REQUIRED DIMENSION IS NOT PROVIDED, REQUEST A CLARIFICATION FROM THE ARCHITECT.

C. NOTIFY ARCHITECT OF ANY DISCREPANCIES AND/OR CONFLICTS WITH FLOOR PLANS OR EXISTING CONDITIONS PRIOR TO STARTING WORK.

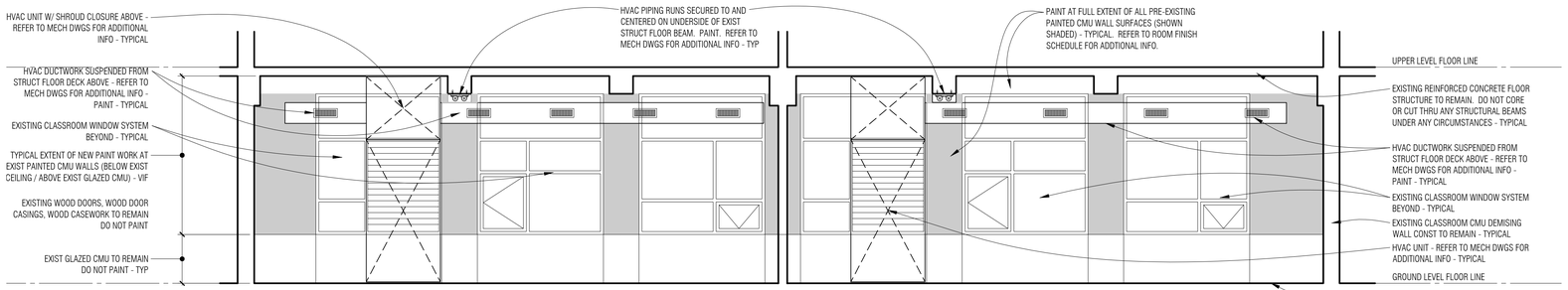
D. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING BUILDING ELEMENTS AND SITE FROM DAMAGE CAUSED BY CONSTRUCTION OR CONSTRUCTION TRADES, AND SHALL REPAIR ANY DAMAGED AREAS AT NO ADDITIONAL COST TO THE OWNER.

E. DISPOSE OF ALL DEMOLITION AND CONSTRUCTION MATERIALS LEGALLY OFF SITE.

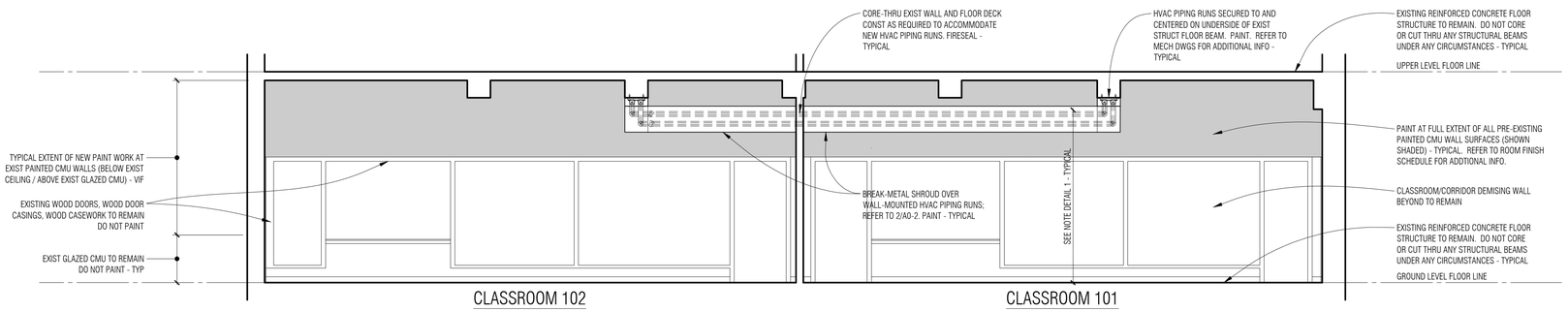
F. ALL CONSTRUCTION AND DEMOLITION MEANS, METHODS AND SAFETY PRECAUTIONS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.



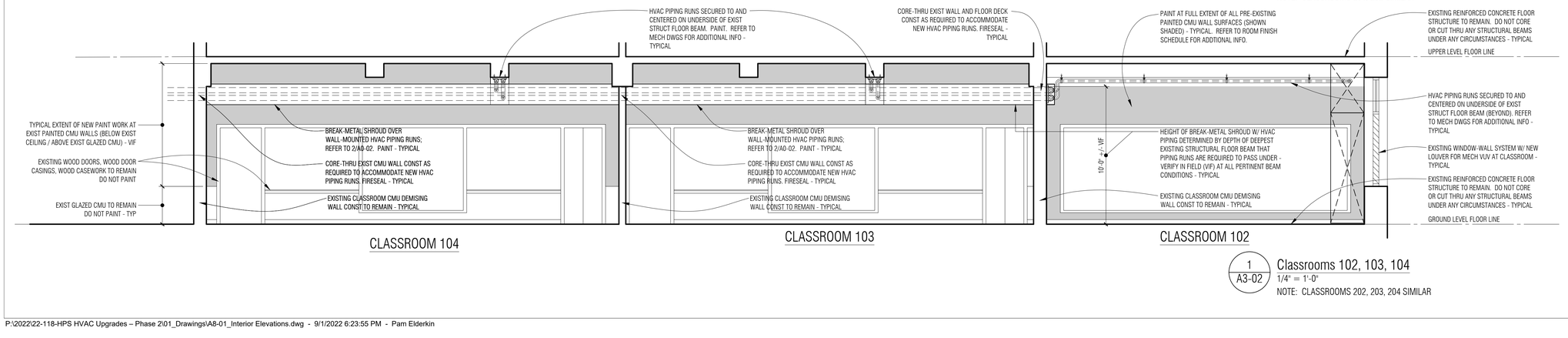
4 / A3-02 Classroom 102
1/4" = 1'-0"
NOTE: CLASSROOMS 101, 103, 104, 201, 202, 203, 204 SIMILAR INCLUDING AT OPPOSITE WALLS



3 / A3-02 Classrooms 102, 103, 104
1/4" = 1'-0"
NOTE: CLASSROOMS 202, 203, 204 SIMILAR



2 / A3-02 Classrooms 101, 102
1/4" = 1'-0"
NOTE: CLASSROOMS 201, 202 SIMILAR



1 / A3-02 Classrooms 102, 103, 104
1/4" = 1'-0"
NOTE: CLASSROOMS 202, 203, 204 SIMILAR

P:\2022\22-118-HPS HVAC Upgrades – Phase 2\01_Drawings\A8-01_Interior Elevations.dwg - 9/1/2022 6:23:55 PM - Pam Elderkin

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KEY PLAN

PLAN NORTH

OWNER

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SHEET NAME

INTERIOR ELEVATIONS

SHEET NO.

A8-01

G E N E R A L N O T E S
GENERAL CONDITIONS

1. IF ANY GENERAL NOTE CONFLICTS WITH ANY DETAIL OR NOTE ON THE PLANS OR IN THE SPECIFICATIONS, THE STRICTEST PROVISION SHALL GOVERN.

2. THE STRUCTURAL DRAWINGS ARE FOR THE PLACEMENT AND SIZE OF STRUCTURAL COMPONENTS ONLY. O.S.H.A., LOCAL GOVERNMENT CODES AND SAFETY CODE REQUIREMENTS SHALL BE ADHERED TO BY THE CONTRACTOR.

3. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER IT IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES PROVIDING TEMPORARY BRACING, SHORING, GUYS OR TIE- DOWNS. THESE TEMPORARY SUPPORTS WILL REMAIN IN PLACE UNTIL ALL STRUCTURAL COMPONENTS ARE IN PLACE AND COMPLETED.

4. USE OF ENGINEERING DRAWINGS AS ERECTION DRAWINGS BY THE CONTRACTOR IS STRICTLY PROHIBITED. DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR BUILDING LAYOUT AND LOCATION. SEE ARCHITECTURAL DRAWINGS AND SITE PLAN FOR THESE PURPOSES.

5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AT THE RATE OF NO MORE THAN 80 DRAWINGS PER WEEK. THE CONTRACTOR SHALL SUBMIT A SCHEDULE OF SHOP DRAWINGS PRIOR TO SUBMITTAL. THE CONTRACTOR SHALL CHECK SHOP DRAWINGS PRIOR TO SUBMITTAL AND IS SOLELY RESPONSIBLE FOR ERRORS & OMISSION IN THE PREPARATION OF SHOP DRAWINGS TO CONFORM TO THE DESIGN DRAWINGS. SUBMIT NO MORE THAN ONE REPRODUCIBLE AND TWO PRINTS OF SHOP DRAWINGS FOR ENGINEER REVIEW. TWO COPIES WILL BE RETURNED TO THE ARCHITECT.

EXISTING CONDITIONS

1. VERIFY ALL EXISTING ASSUMED DIMENSIONS AND CONDITIONS (I.E. EXISTING MATERIALS; FRAMING MEMBER SIZES AND LOCATIONS; METHODS OF CONSTRUCTION; ETC.) AT THE SITE PRIOR TO CONSTRUCTION AND FABRICATION. IF DISCREPANCIES ARE FOUND, NOTIFY ARCHITECT BEFORE PROCEEDING WITH WORK.

FOUNDATIONS

1. FOOTINGS SHALL BEAR ON FIRM, UNDISTURBED SOIL WITH AN ASSUMED SAFE BEARING CAPACITY OF 2000 P.S.F. IF SOIL OF THIS CAPACITY IS NOT FOUND AT THE ELEVATIONS INDICATED, FOOTINGS SHALL BE ENLARGED OR LOWERED AT THE DIRECTION OF THE ARCHITECT. VERIFY FOUNDATION SOIL BEARING PRESSURE IN FIELD BY SOILS ENGINEER.

CONCRETE

1. MINIMUM CONCRETE STRENGTH FOR EXPOSED CONCRETE SHALL BE 4000 PSI WITH 6% + 1% ENTRAINED AIR U.O.N.

   A. PROVIDE 4000 P.S.I. 28-DAY COMPRESSIVE STRENGTH; W/C RATIO, 0.45 MAXIMUM (AIR-ENTRAINED), 6.0 BAG CEMENT MIX FOR ALL EXTERIOR CONCRETE UNLESS NOTED OTHERWISE.

MASONRY

1. THE MASONRY PORTIONS OF THIS STRUCTURE ARE DESIGNED ACCORDING TO THE LATEST ALLOWABLE STRESS DESIGN PROVISIONS OF THE MASONRY STANDARDS JOINT COMMITTEE (MSJC) BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (ACI 530/ASCE 602) INCLUDING SECTIONS 2106 AND 2107 OF CHAPTER 21 IN THE MICHIGAN BUILDING CODE. MASONRY COMPONENTS HAVE BEEN DESIGNED ACCORDING TO THE PROVISIONS FOR SEISMIC DESIGN CATEGORY B.

2. ALL STRUCTURAL MASONRY IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST MASONRY STANDARDS JOINT COMMITTEE (MSJC) BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (TMS 402/ACI 530/ASCE 5) AND SPECIFICATIONS FOR MASONRY STRUCTURES (TMS 602/ACI 530.1/ASCE 6) MASONRY SUBMITTALS ARE REQUIRED BY ACI 530.1/ASCE 6/TMS 602. SECTION 1.5 MASONRY TESTING AND INSPECTIONS ARE REQUIRED BY ACI 530.1/ASCE 6/TMS 602 SECTION 1.6, TABLE 5.

3. ALL STRUCTURAL MASONRY HAS BEEN ENGINEERED IN ACCORDANCE WITH CHAPTER 2 ALLOWABLE STRENGTH DESIGN. COMPRESSION STRENGTH SHALL BE DETERMINED ACCORDING TO THE UNIT STRENGTH METHOD FOR CONCRETE MASONRY MSJC SECTION 1.4. B.2.b.

4. ALL BLOCK SHALL CONFORM TO ASTM C90, TYPE I, WITH A MINIMUM UNIT NET AREA COMPRESSIVE STRENGTH OF 2800 PSI.

5. MASONRY COMPRESSIVE STRENGTH f'm = 2000 PSI MINIMUM.

6. MORTAR SHALL BE TYPE "S" (1800 PSI) CONFORMING TO ASTM C-270. USE MORTAR CEMENT WHERE EXTERIOR WALLS ARE UNREINFORCED.

7. PROVIDE HORIZONTAL WIRE TYPE REINFORCING WITH 9 GAUGE SIDE AND CROSS MEMBERS IN EVERY SECOND COURSE (16" O.C.), IN ALL MASONRY WALLS. WALLS WITH VERTICAL REINFORCING SHALL ONLY HAVE "LADDER" TYPE REINFORCING.

8. ALL REINFORCING BARS, DOWELS AND TIES SHALL CONFORM TO A.S.T.M. A615 GRADE 60. REINFORCING STEEL SHALL BE CONTINUOUS, FABRICATED AND PLACED IN ACCORDANCE WITH A.C.I. - 315 LATEST EDITION AND HAVE THE FOLLOWING MINIMUM LAP LENGTHS:

BAR SIZE	8" CMU	12" CMU
#3	18"	18"
#4	24"	24"
#5	30"	30"
#6	38"	36"
#7		42"
#8	PROVIDE MECH. SPLICE	

9. ALL MASONRY BELOW GRADE SHALL BE GROUTED SOLID.

10. MASONRY GROUT SHALL CONFORM TO ASTM C 476, WITH PEA GRAVEL AGGREGATE AND A MINIMUM STRENGTH OF 2000 PSI, BUT NOT LESS THAN SPECIFIED f'm.

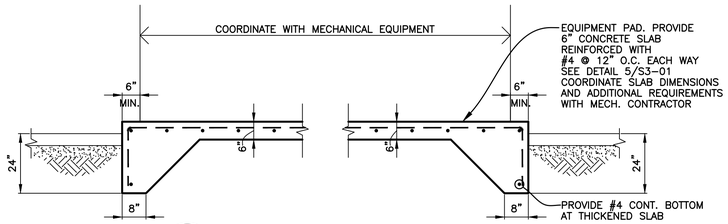
11. PROVIDE DOWELS INTO FOUNDATION TO MATCH SIZE AND SPACING OF VERTICAL REINFORCEMENT AT ALL COLUMNS AND WALLS, UNLESS OTHERWISE NOTED.

STRUCTURAL STEEL

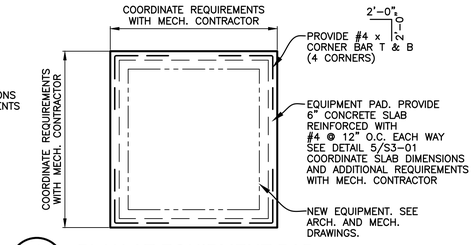
1. STEEL DESIGN, FABRICATION AND ERECTION TO BE IN ACCORDANCE WITH THE LATEST A.I.S.C. MANUAL AND SPECIFICATION FOR STRUCTURAL STEEL FOR BUILDINGS. ALL WIDE FLANGE BEAMS AND COLUMNS SHALL CONFORM TO THE LATEST ASTM. SERIAL DESIGNATION A992, GR50; ALL MISCELLANEOUS STEEL PLATES, BARS, ANGLES, ETC., SHALL CONFORM TO ASTM A36; STEEL TUBING TO BE ASTM A500, GRADE B; STEEL PIPE ASTM. A-53, GRADE B. ANCHOR BOLTS TO BE ASTM F1554 GRADE 36 KSI MINIMUM UNLESS OTHERWISE NOTED

2. ALL WELDED CONNECTIONS SHALL BE IN ACCORDANCE WITH THE LATEST AWS CODE, E70XX ELECTRODES, WITH WELDING PERFORMED BY QUALIFIED WELDERS.

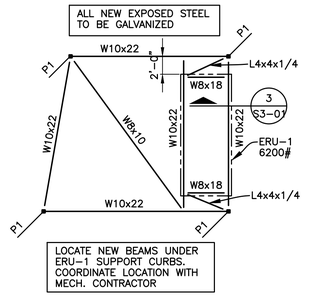
3. THE DESIGN, CONFIGURATION & ERECTION SAFETY OF ALL STRUCTURAL STEEL CONNECTIONS SHALL BE THE RESPONSIBILITY OF THE STRUCTURAL STEEL FABRICATOR. REVIEW AND ACCEPTANCE OF THE SHOP DRAWINGS BY THE ENGINEER SHALL CONSTITUTE APPROVAL OF THE LOAD CARRYING ADEQUACY ONLY.



5 S3-01 EQUIPMENT PAD DETAIL
SCALE : 1/2" = 1'-0"

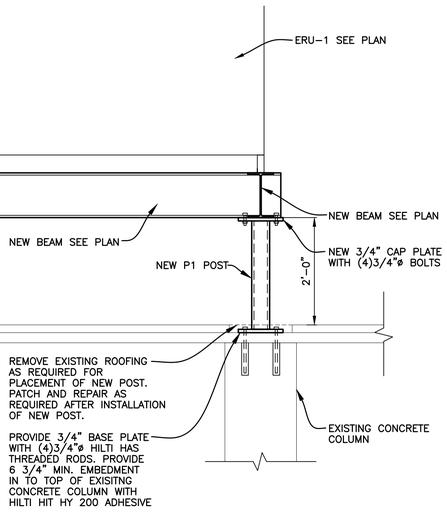


4 S3-01 PLAN AT EQUIPMENT PAD
SCALE : 1/4" = 1'-0" SEE ARCH. & MECH. DRAWINGS FOR LOCATION

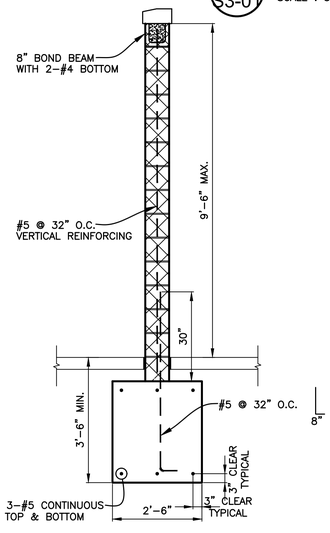


NORTH
NEW ROOF RACK ABOVE ROOF PLAN
SCALE : 1/8" = 1'-0"

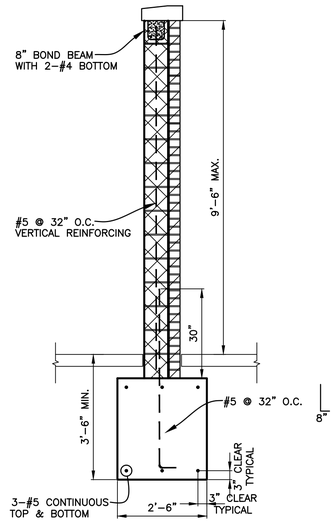
P1: NEW GALVANIZED HSS4x4x1/4. POST UP OFF EXISTING CONCRETE COLUMN FOR SUPPORT OF NEW RACK STEEL. SEE DETAIL 3/S3-01. FIELD VERIFY EXACT SIZE AND LOCATION OF EXISTING CONCRETE COLUMN BELOW.



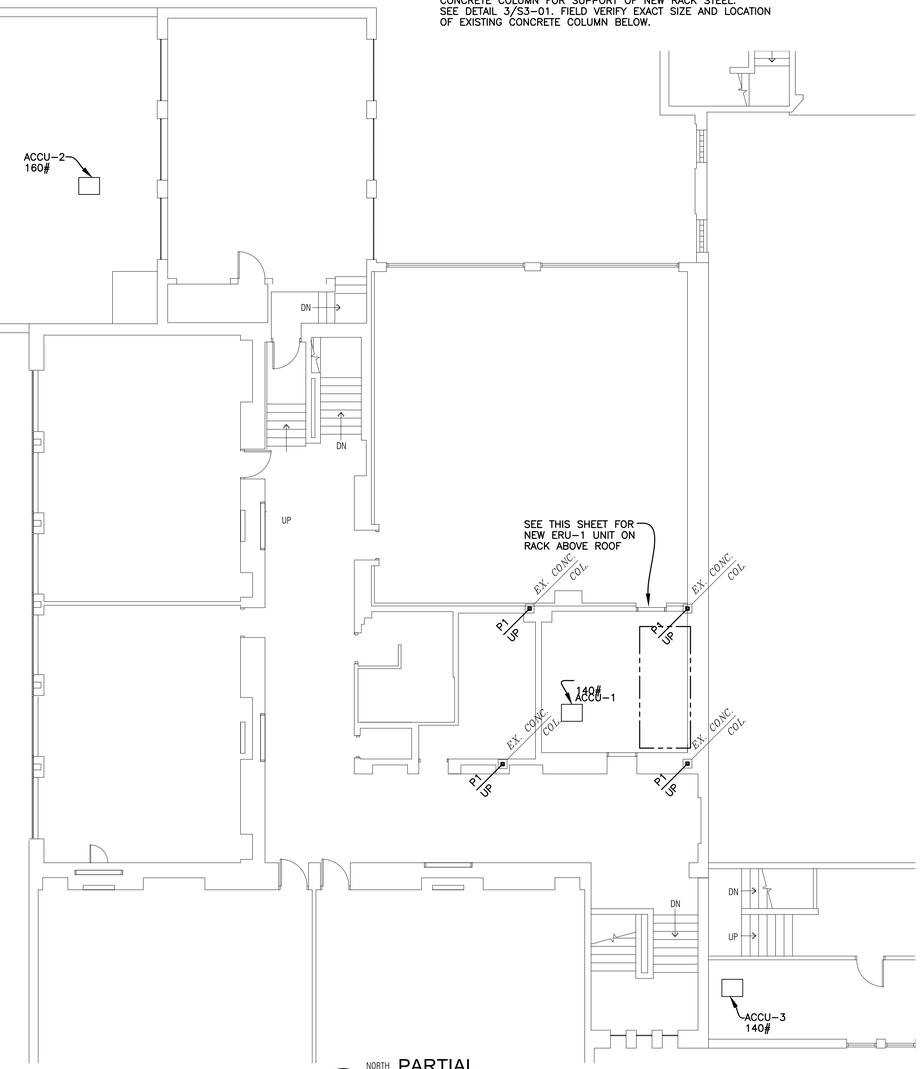
3 S3-01 SECTION AT ERU-1
SCALE : 3/4" = 1'-0"



2 S3-01 SECTION
SCALE : 1/2" = 1'-0"



1 S3-01 SECTION
SCALE : 1/2" = 1'-0"



NORTH
PARTIAL ROOF FRAMING PLAN
SCALE : 1/8" = 1'-0"

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KEY PLAN

PLAN NORTH

OWNER

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CS

CHECKED BY
MJ

APPROVED BY
TS

SHEET NAME

ROOF FRAMING PLAN

SHEET NO.

S3-01

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
ATD	AIR TRANSFER DUCT
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 PERFORMACE
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
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 VENTILAITNG
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
KA	THOUSAND AMP
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
MOP	MAXIMUM OVERCURRENT PROTECTION
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
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
SCCR	SHORT CIRCUIT CURRENT RATING
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
TMR	TIMER SWITCH
TPD	TEPID WATER
TSP	TOTAL STATIC PRESSURE
TU	(AIR) TERMINAL UNIT
TV	TURNING VANES
TW	TEMPERED WATER
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
WASD	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
ZVB	ZONE VALVE BOX

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	2WV	VALVE - 2 WAY CONTROL VALVE
	GUARD FOR STAT OR SENSOR	3WV	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
CP	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
VCC	PIPE - RUBBER FLEXIBLE CONNECTION
	PIPE - GUIDE
	PIPE - TEE DOWN
	PIPE - TEE UP
	PIPE - UNION
T/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
	AIR TERMINAL UNIT
TU-101	AIR TERMINAL UNIT WITH HEATING COIL
VTU-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/ ROUND SMOOTH RADIUS
	ELBOW DOWN - RECTANGULAR
	ELBOW DOWN - ROUND
	ELBOW UP - RECTANGULAR
	ELBOW UP - ROUND
	FAN - AXIAL
	FAN - CENTRIFUGAL (ELEVATION)
	HEATING COIL
D	INCLINED DROP IN DIRECTION OF AIRFLOW
R	INCLINED RISE IN DIRECTION OF AIRFLOW
	INTAKE OR RELIEF HOOD
	REGISTER - RETURN OR EXHAUST
	REGISTER - RETURN WITH BOOT
	REGISTER - TRANSFER GRILLE
	ROOF EXHAUST FAN
	TRANSITION - CONCENTRIC
	TRANSITION - ECCENTRIC
	UNIT HEATER - HORIZONTAL THROW
	UNIT HEATER - VERTICAL THROW

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
	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

MECHANICAL DRAWING INDEX

STANDARD METHODS OF NOTATION

S-1
10#
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

(2)WC-1
PLUMBING FIXTURE UNIT IDENTIFICATION TAG
WATER CLOSET TYPE "1"
TYPICAL FOR 2

8
PIPE DIAMETER NOTATION
ALL SIZES IN INCHES

8# 7
22x10 18x14@
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

1 / M5.1
PLAN NUMBER
SHEET WHERE ENLARGED PLAN IS DRAWN

1 / M5.1
SECTION OR PLAN NUMBER
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.

SECTION OR ENLARGED PLAN

1 / M5.1

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

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

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PBA Project No. 2022.0015

KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

DRAWN BY
JPG

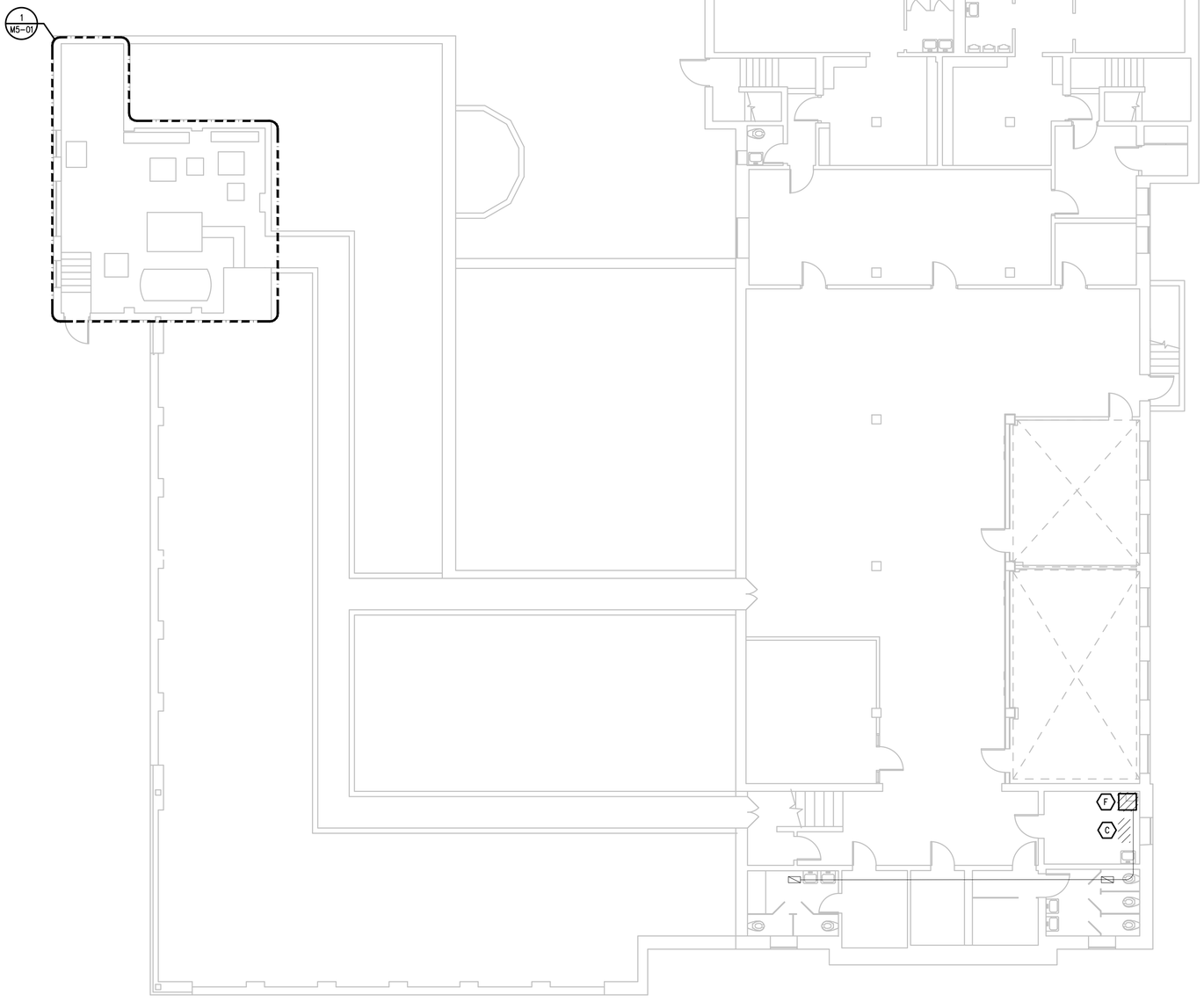
CHECKED BY
SVM

APPROVED BY
SVM

SHEET NAME
MECHANICAL STANDARDS AND DRAWING INDEX

SHEET NO.
M0-01

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



LOWER LEVEL MECHANICAL DEMOLITION PLAN
SCALE: 1/8" = 1' - 0"

MECHANICAL DEMOLITION GENERAL NOTES:

1. ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.
2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. ACTUAL ROUTING AND SIZES OF EXISTING PIPING AND DUCTWORK MIGHT DIFFER TO A LIMITED EXTENT FROM WHAT IS SHOWN. MAJOR DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL EXISTING CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
3. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
4. ALL MECHANICAL ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETE, INCLUDING ALL RELATED ITEMS SUCH AS HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTWORK.

(#) DEMOLITION KEY NOTES:

A. REMOVE SHEET METAL BOX FAN/HEATER FROM WALL CAVITY. CAP STEAM AND CONDENSATE PIPING IN A CONCEALED MANNER. PROVIDE ACCESS DOOR FOR CAPPED PIPING (REFER TO ARCHITECTURAL).

B. REMOVE STEAM UNIT VENTILATOR AND ASSOCIATED CONTROLS. CAP STEAM AND CONDENSATE PIPING IN A CONCEALED MANNER. BLANK OFF LOUVER.

C. REMOVE STEAM FIN TUBE RADIATION AND ASSOCIATED STEAM TRAP AND CONTROLS. CAP STEAM AND CONDENSATE BRANCH PIPING AS CLOSE TO MAIN AS POSSIBLE.

D. REMOVE STEAM AIR HANDLING UNIT AND ASSOCIATED SUPPLY, RETURN AND OUTDOOR AIR DUCTWORK COMPLETE. BLANK OFF LOUVER (SEE DETAIL). CAP STEAM AND CONDENSATE PIPING IN A CONCEALED MANNER.

E. REMOVE STEAM AHU AND ASSOCIATED DUCTWORK AND CONTROLS. COORDINATE WALL INFILL WITH ARCHITECTURAL.

F. REMOVE INLINE EXHAUST FAN. PREPARE DUCTWORK FOR NEW CONNECTION.

G. REMOVE SHEET METAL BOX FAN/HEATER FROM CEILING CAVITY. CAP STEAM AND CONDENSATE PIPING IN A CONCEALED MANNER. PROVIDE ACCESS DOOR FOR CAPPED PIPING (REFER TO ARCHITECTURAL).

H. EXISTING LOUVER TO REMAIN. SEE BLANK OFF DETAIL.

I. REMOVE AND DISCONNECT RESIDENTIAL EXHAUST FAN. PREPARE HOLE IN MASONRY FOR NEW WORK.

J. REMOVE 3ø EXHAUST DUCT BRANCH. PREPARE FOR NEW WORK.

K. CAP STEAM AND CONDENSATE PIPING TO EXISTING FTR IN A CONCEALED MANNER. CAP PIPING AS CLOSE TO MAIN AS POSSIBLE.

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JPG

CHECKED BY
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APPROVED BY
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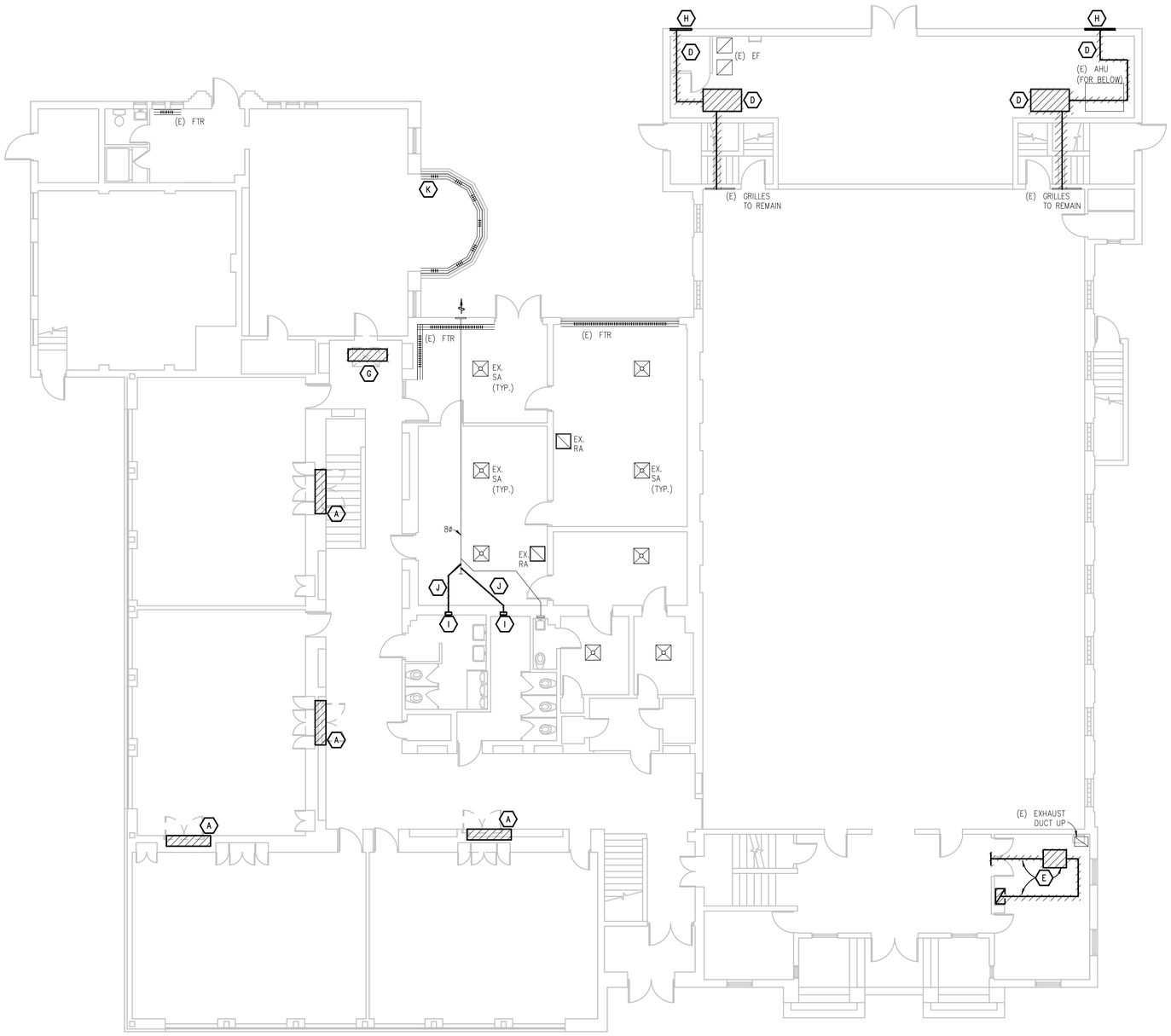
SHEET NAME
LOWER LEVEL MECHANICAL DEMOLITION PLAN

SHEET NO.
M1-01

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



GROUND LEVEL MECHANICAL DEMOLITION PLAN
SCALE: 1/8" = 1' - 0"

MECHANICAL DEMOLITION GENERAL NOTES:

1. ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.
2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. ACTUAL ROUTING AND SIZES OF EXISTING PIPING AND DUCTWORK MIGHT DIFFER TO A LIMITED EXTENT FROM WHAT IS SHOWN. MAJOR DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL EXISTING CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
3. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
4. ALL MECHANICAL ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETE, INCLUDING ALL RELATED ITEMS SUCH AS HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTWORK.

(#) DEMOLITION KEY NOTES:

A. REMOVE SHEET METAL BOX FAN/HEATER FROM WALL CAVITY. CAP STEAM AND CONDENSATE PIPING IN A CONCEALED MANNER. PROVIDE ACCESS DOOR FOR CAPPED PIPING (REFER TO ARCHITECTURAL).

B. REMOVE STEAM UNIT VENTILATOR AND ASSOCIATED CONTROLS. CAP STEAM AND CONDENSATE PIPING IN A CONCEALED MANNER. BLANK OFF LOUVER.

C. REMOVE STEAM FIN TUBE RADIATION AND ASSOCIATED STEAM TRAP AND CONTROLS. CAP STEAM AND CONDENSATE BRANCH PIPING AS CLOSE TO MAIN AS POSSIBLE.

D. REMOVE STEAM AIR HANDLING UNIT AND ASSOCIATED SUPPLY, RETURN AND OUTDOOR AIR DUCTWORK COMPLETE. BLANK OFF LOUVER (SEE DETAIL). CAP STEAM AND CONDENSATE PIPING IN A CONCEALED MANNER.

E. REMOVE STEAM AHU AND ASSOCIATED DUCTWORK AND CONTROLS. COORDINATE WALL INFILL WITH ARCHITECTURAL.

F. REMOVE INLINE EXHAUST FAN. PREPARE DUCTWORK FOR NEW CONNECTION.

G. REMOVE SHEET METAL BOX FAN/HEATER FROM CEILING CAVITY. CAP STEAM AND CONDENSATE PIPING IN A CONCEALED MANNER. PROVIDE ACCESS DOOR FOR CAPPED PIPING (REFER TO ARCHITECTURAL).

H. EXISTING LOUVER TO REMAIN. SEE BLANK OFF DETAIL.

I. REMOVE AND DISCONNECT RESIDENTIAL EXHAUST FAN. PREPARE HOLE IN MASONRY FOR NEW WORK.

J. REMOVE 3ø EXHAUST DUCT BRANCH. PREPARE FOR NEW WORK.

K. CAP STEAM AND CONDENSATE PIPING TO EXISTING FTR IN A CONCEALED MANNER. CAP PIPING AS CLOSE TO MAIN AS POSSIBLE.

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PBA Project No. 2022.0015

KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

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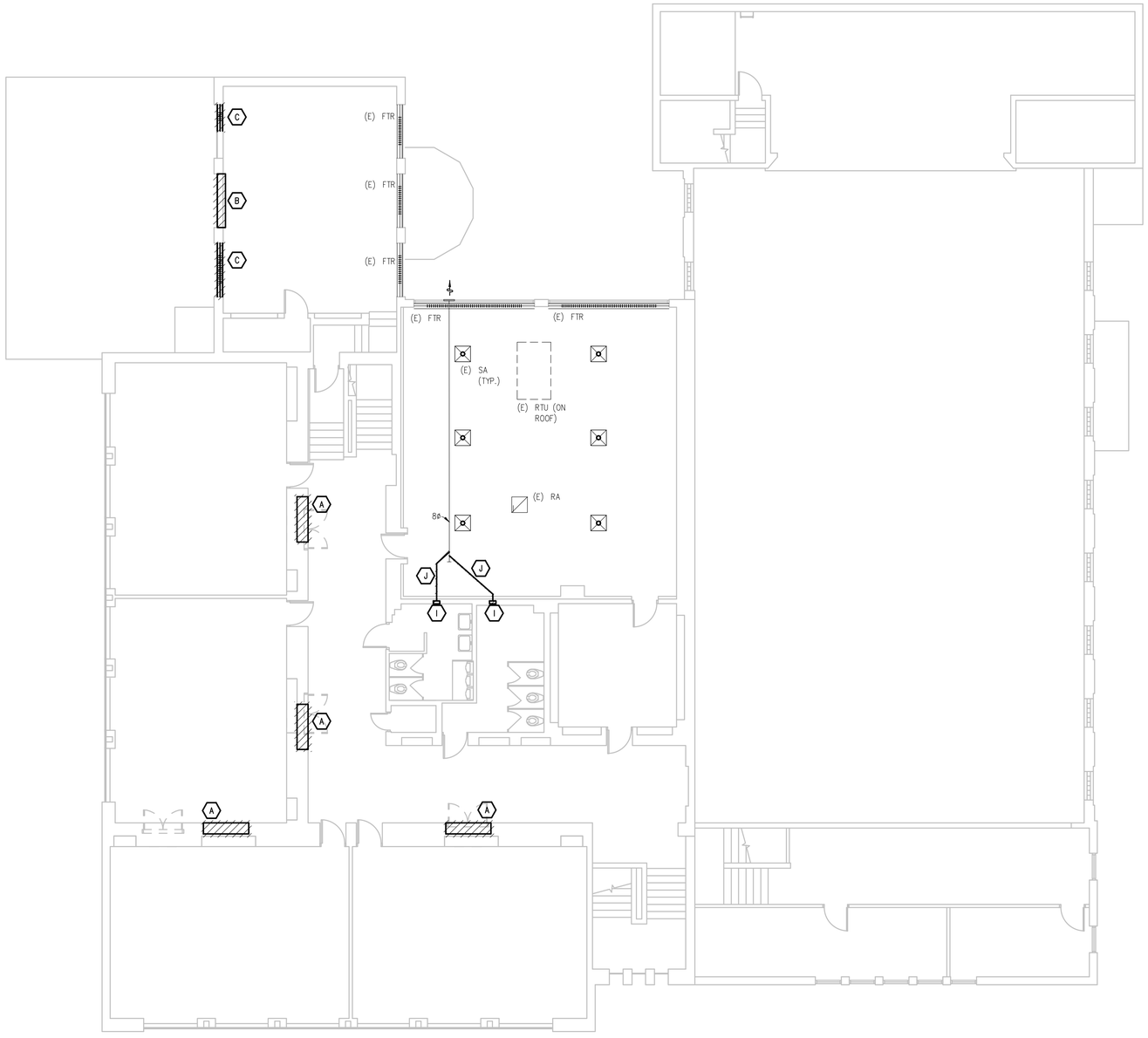
SHEET NAME
GROUND LEVEL MECHANICAL DEMOLITION PLAN

SHEET NO.
M1-02

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



UPPER LEVEL MECHANICAL DEMOLITION PLAN
SCALE: 1/8" = 1' - 0"

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C. REMOVE STEAM FIN TUBE RADIATION AND ASSOCIATED STEAM TRAP AND CONTROLS. CAP STEAM AND CONDENSATE BRANCH PIPING AS CLOSE TO MAIN AS POSSIBLE.

D. REMOVE STEAM AIR HANDLING UNIT AND ASSOCIATED SUPPLY, RETURN AND OUTDOOR AIR DUCTWORK COMPLETE. BLANK OFF LOUVER (SEE DETAIL). CAP STEAM AND CONDENSATE PIPING IN A CONCEALED MANNER.

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SHEET NAME
UPPER LEVEL MECHANICAL DEMOLITION PLAN

SHEET NO.
M1-03

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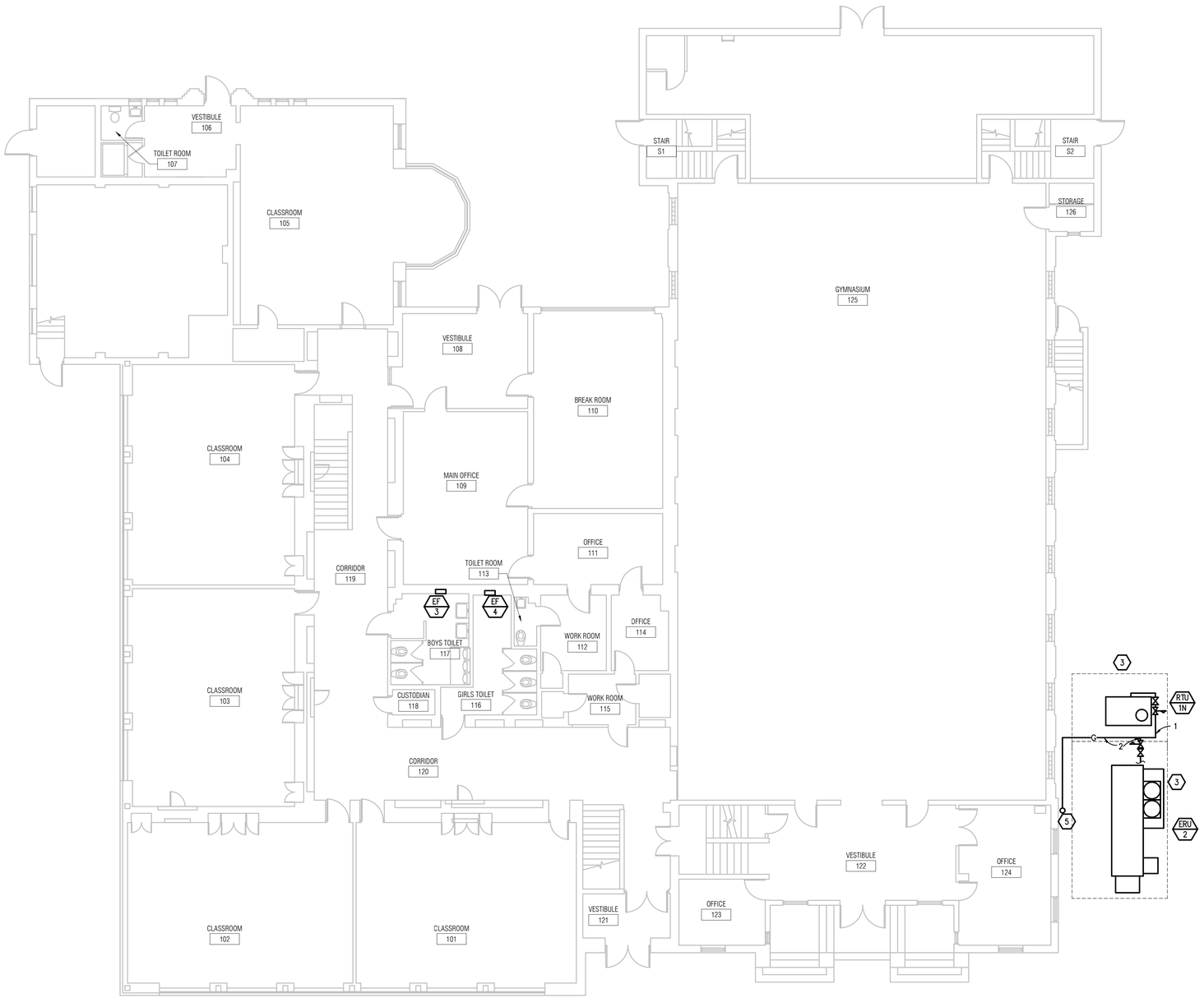

PLUMBING GENERAL NOTES:

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 , 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. 3 GAS CONNECTS TO 3 GAS PIPE IN BOILER ROOM BELOW. PIPE TO RUN ON ROOF TO FEED NEW EQUIPMENT. SEE GAS PIPING DETAIL. PROVIDE PIPE PORTAL.
2. ROOF SUPPORTS (TYPICAL).
3. SERVICE CLEARANCE.
4. 2 GAS GOES DOWN WALL TO GRADE TO FEED ERU-2 & RTU-1.
5. 2 GAS FROM HIGH ROOF ABOVE. SEE PLUMBING ROOF PLAN FOR CONTINUATION.

GROUND LEVEL PLUMBING PLAN

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

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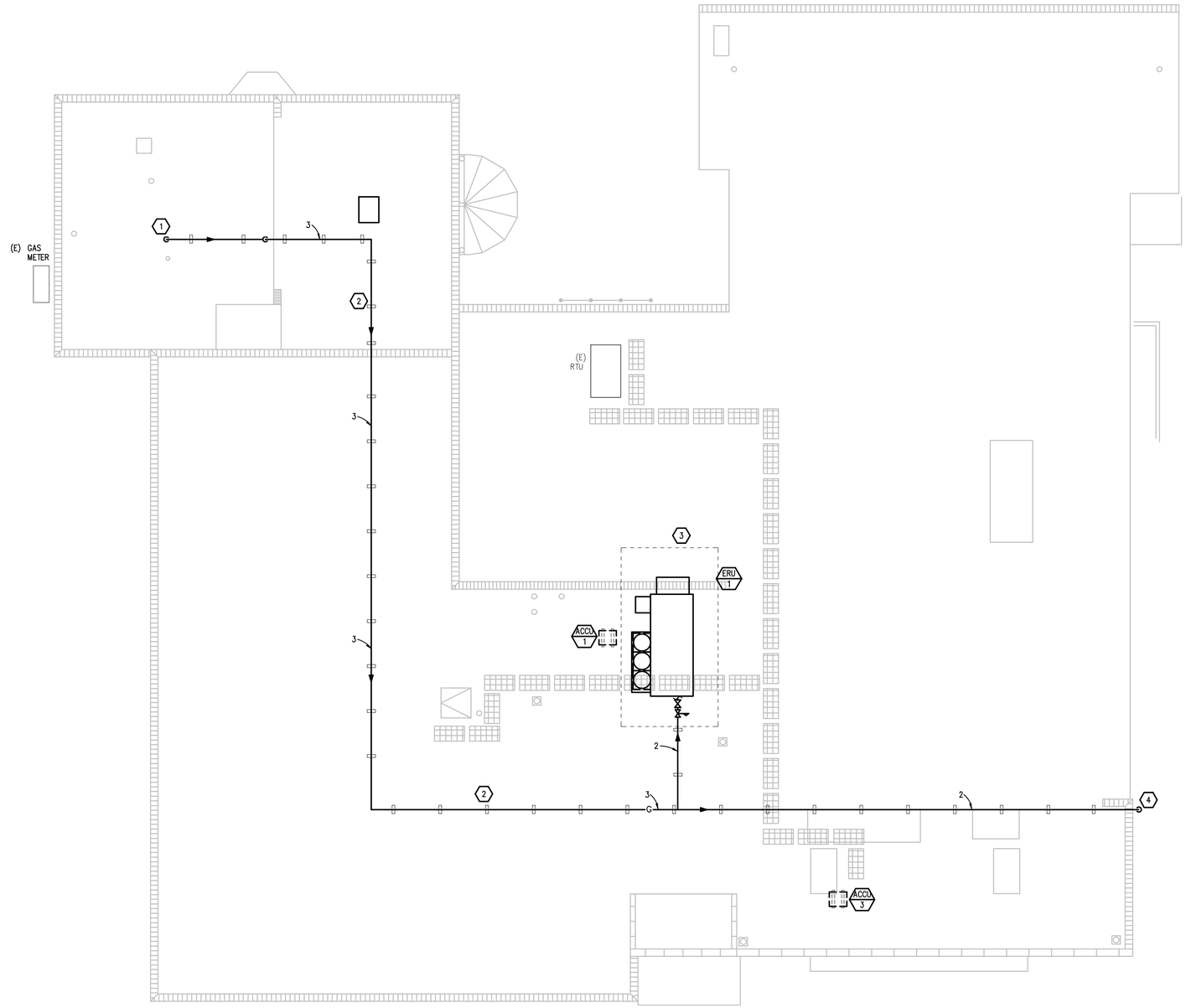
SHEET NAME
GROUND LEVEL PLUMBING PLAN

SHEET NO.
M2-02

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



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

PLUMBING 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 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.
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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 , 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. 3 GAS CONNECTS TO 3 GAS PIPE IN BOILER ROOM BELOW. PIPE TO RUN ON ROOF TO FEED NEW EQUIPMENT. SEE GAS PIPING DETAIL. PROVIDE PIPE PORTAL.
2. ROOF SUPPORTS (TYPICAL).
3. SERVICE CLEARANCE.
4. 2 GAS GOES DOWN WALL TO GRADE TO FEED ERU-2 & RTU-1.
5. 2 GAS FROM HIGH ROOF ABOVE. SEE PLUMBING ROOF PLAN FOR CONTINUATION.

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SHEET NAME
ROOF PLUMBING PLAN

SHEET NO.
M2-20

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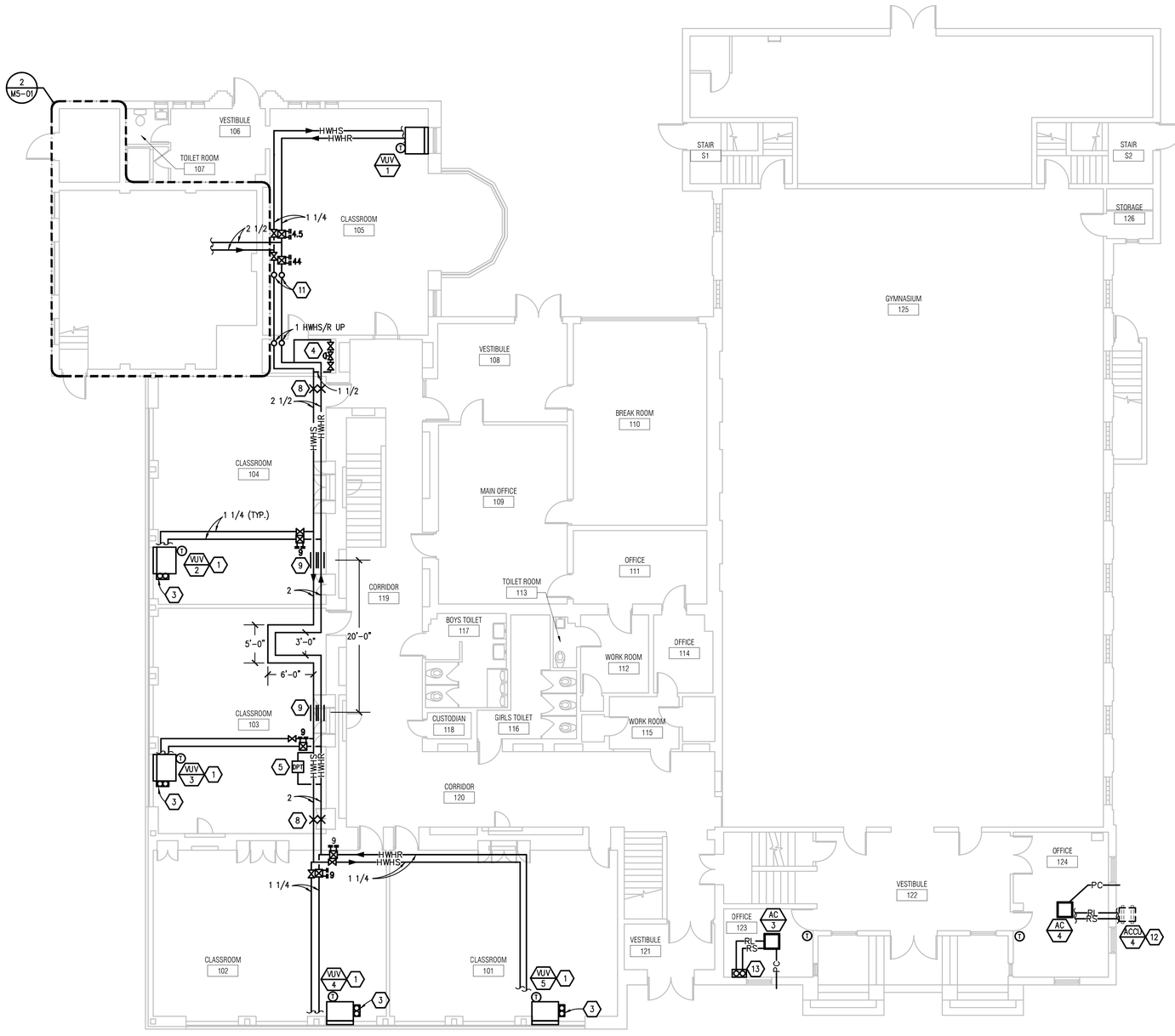

GROUND LEVEL HVAC PIPING PLAN

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

HVAC PIPING 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. 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. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

(#) CONSTRUCTION KEY NOTES:

1. PROVIDE CONDENSATE PIPING BETWEEN VUV ON 2nd FLOOR AND 1st FLOOR VUV. CONDENSATE TO SPILL OUT 18 INCHES ABOVE GRADE.
2. PROVIDE NECESSARY HWHS & R PIPING TO FACILITATE VUV TOP OR BOTTOM CONNECTION.
3. 1 HWHS & R COMES FROM BELOW TO FEED VUV. PROVIDE VUV MANUFACTURER'S SHEET METAL ENCLOSURE.
4. 1 1/2 MINIMUM BYPASS VALVE (11 GPM).
5. DIFFERENTIAL PRESSURE TRANSMITTER.
6. 1 HWHS & R PIPING FROM BELOW WITHIN SHEET METAL ENCLOSURE.
7. LIQUID & SUCTION REFRIGERANT PIPING GOES UP TO CONDENSER ON ROOF. PROVIDE PIPE PORTAL.
8. PIPE ANCHOR (TYPICAL).
9. PIPE GUIDE (TYPICAL).
10. 1 PUMPED CONDENSATE TO DISCHARGE (WITH AIR GAP) TO MOP SINK.
11. 1 HWHS & R UP TO FEED CONSOLE UV ABOVE.
12. UNIT TO BE MOUNTED ON BRACKETS ON THE WALL REFER TO VIBRATION ISOLATOR SCHEDULE.
13. LIQUID & SUCTION REFRIGERANT PIPING GOES UP THRU SECOND FLOOR TO CONDENSER ON ROOF.

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SHEET NAME

GROUND LEVEL HVAC PIPING PLAN

SHEET NO.

M3-02

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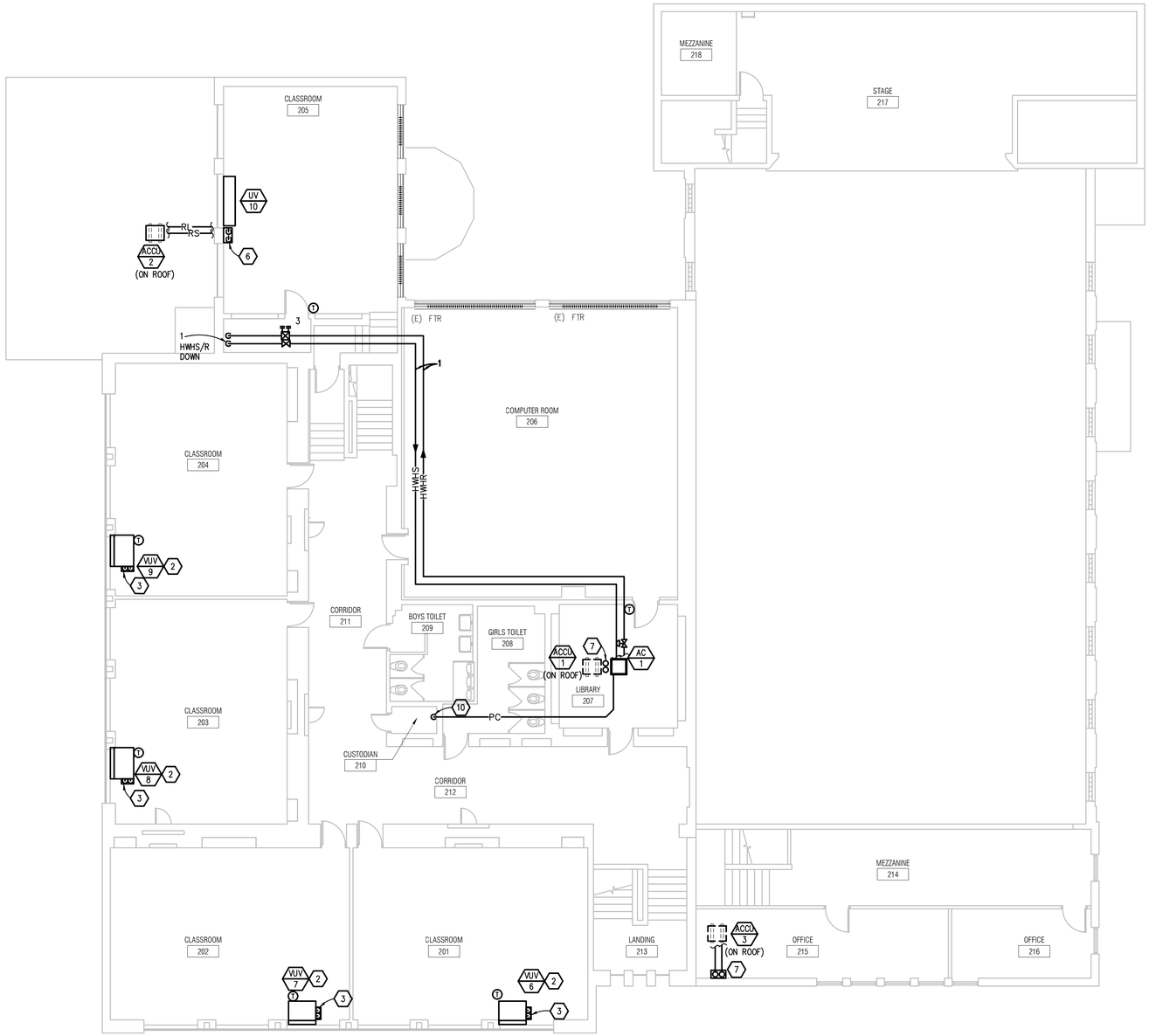

UPPER LEVEL HVAC PIPING PLAN
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HVAC PIPING GENERAL NOTES:

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5. DIFFERENTIAL PRESSURE TRANSMITTER.
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8. PIPE ANCHOR (TYPICAL).
9. PIPE GUIDE (TYPICAL).
10. 1 PUMPED CONDENSATE TO DISCHARGE (WITH AIR GAP) TO MOP SINK.
11. 1 HWHS & R UP TO FEED CONSOLE UV ABOVE.
12. UNIT TO BE MOUNTED ON BRACKETS ON THE WALL REFER TO VIBRATION ISOLATOR SCHEDULE.
13. LIQUID & SUCTION REFRIGERANT PIPING GOES UP THRU SECOND FLOOR TO CONDENSER ON ROOF.

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SHEET NAME
UPPER LEVEL HVAC PIPING PLAN

SHEET NO.
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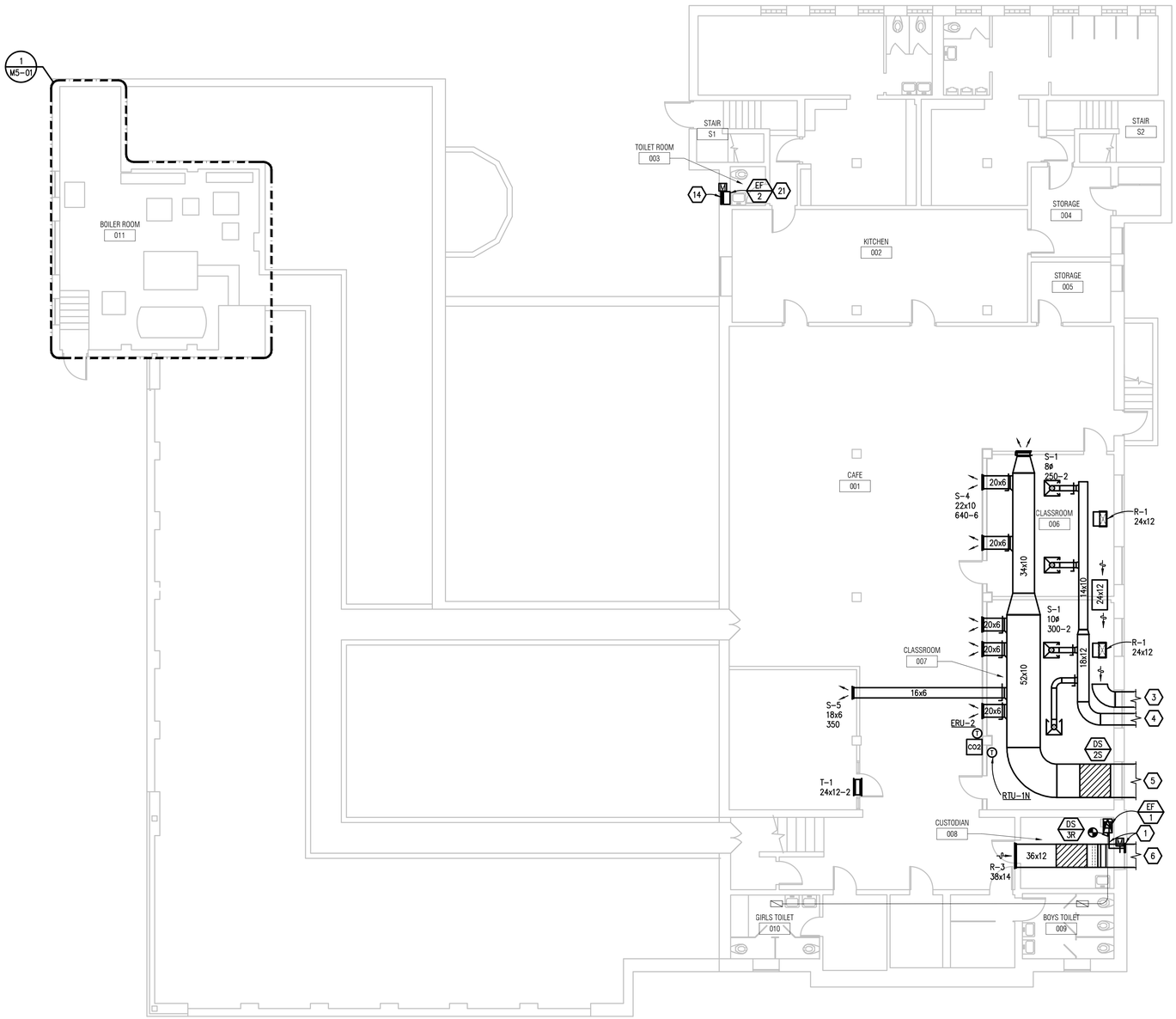

LOWER LEVEL SHEET METAL PLAN
SCALE: 1/8" = 1' - 0"

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.
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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.
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7. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

(#) CONSTRUCTION KEY NOTES:

1. PROVIDE NEW 12 x 12 EXHAUST DUCT TO NEW 12 x 12 LOUVER. PROVIDE INSECT SCREEN ON LOUVER.
2. DOUBLE WALL OVAL DUCT. TYPICAL FOR ALL CLASSROOMS WITH VUVs.
3. 24x12 RETURN AIR DUCT TO UNIT ON GRADE. SEE M4-02 FOR CONTINUATION.
4. 18x12 SUPPLY AIR DUCT TO UNIT ON GRADE. SEE M4-02 FOR CONTINUATION.
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9. PROVIDE 2 HOUR FIRE & SMOKE DAMPER(S).
10. SERVICE CLEARANCE.
11. SEE LOWER SHEET METAL PLAN M4-01 FOR CONTINUATION.
12. INSTALL UV MANUFACTURER PROVIDED MATCHING SHEET METAL CABINETRY (OPEN)
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KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

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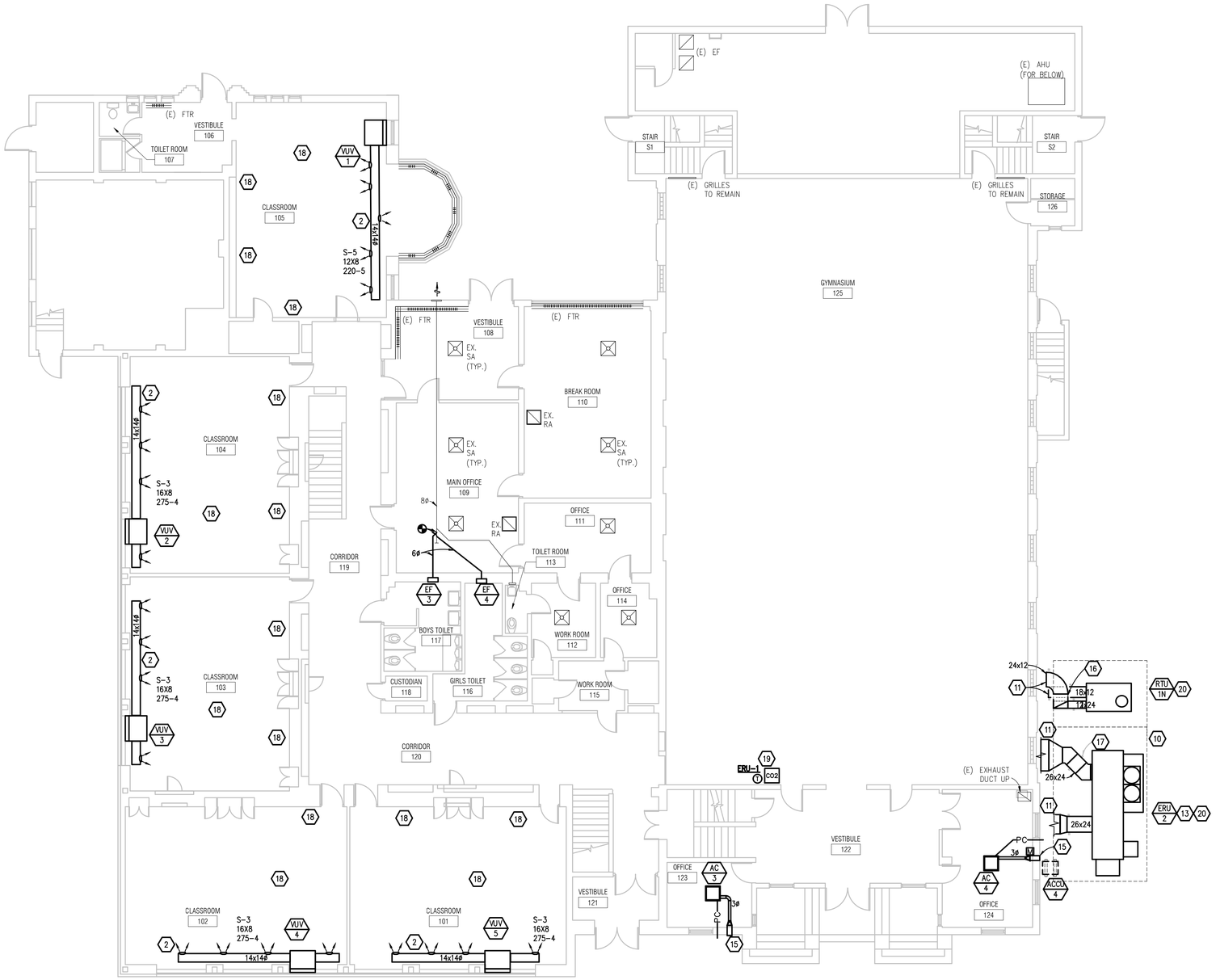
SHEET NAME
LOWER LEVEL SHEET METAL PLAN

SHEET NO.
M4-01

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



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GROUND LEVEL SHEET METAL PLAN

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

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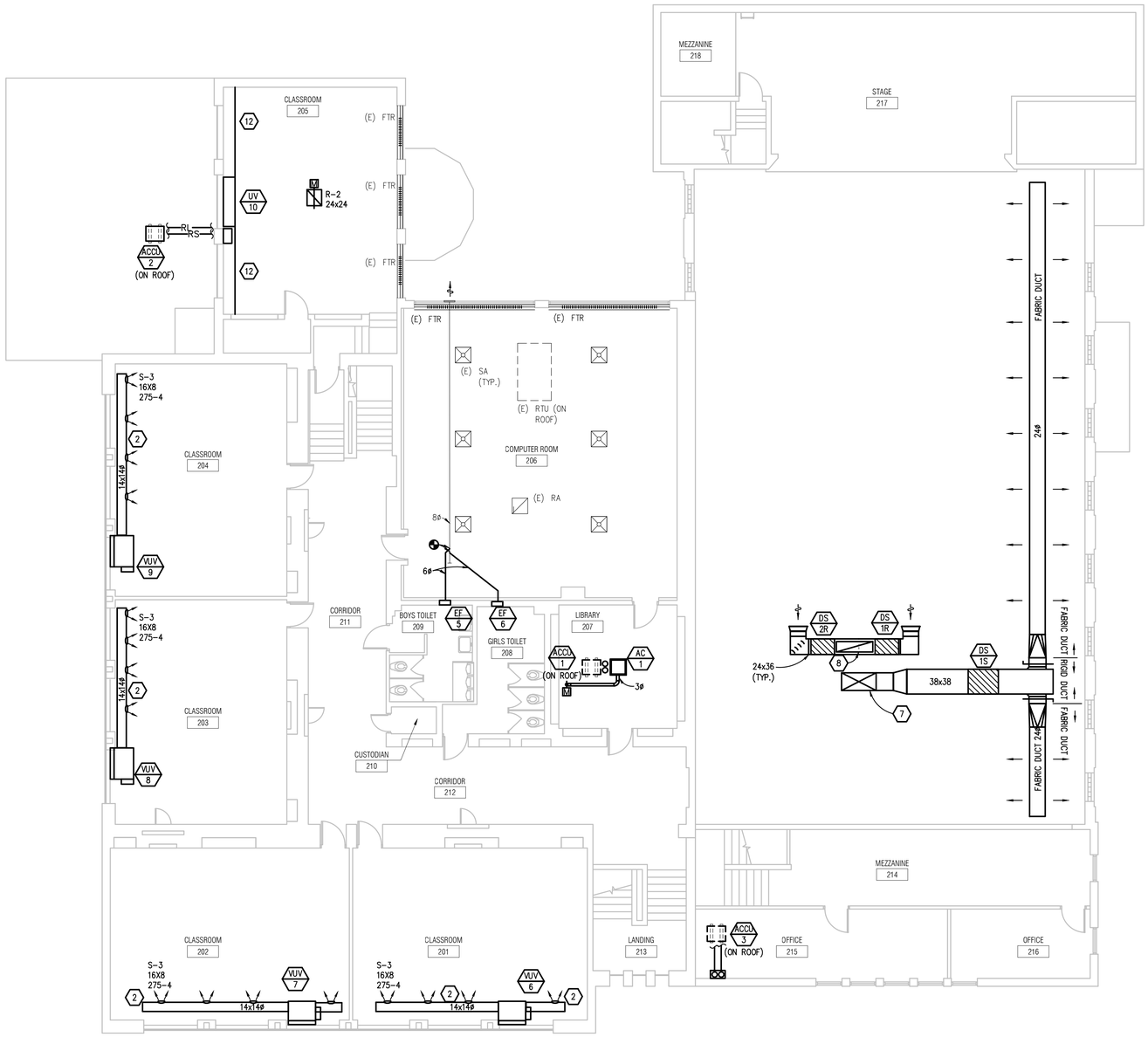
SHEET NAME
GROUND LEVEL SHEET METAL PLAN

SHEET NO.
M4-02

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



UPPER LEVEL SHEET METAL PLAN
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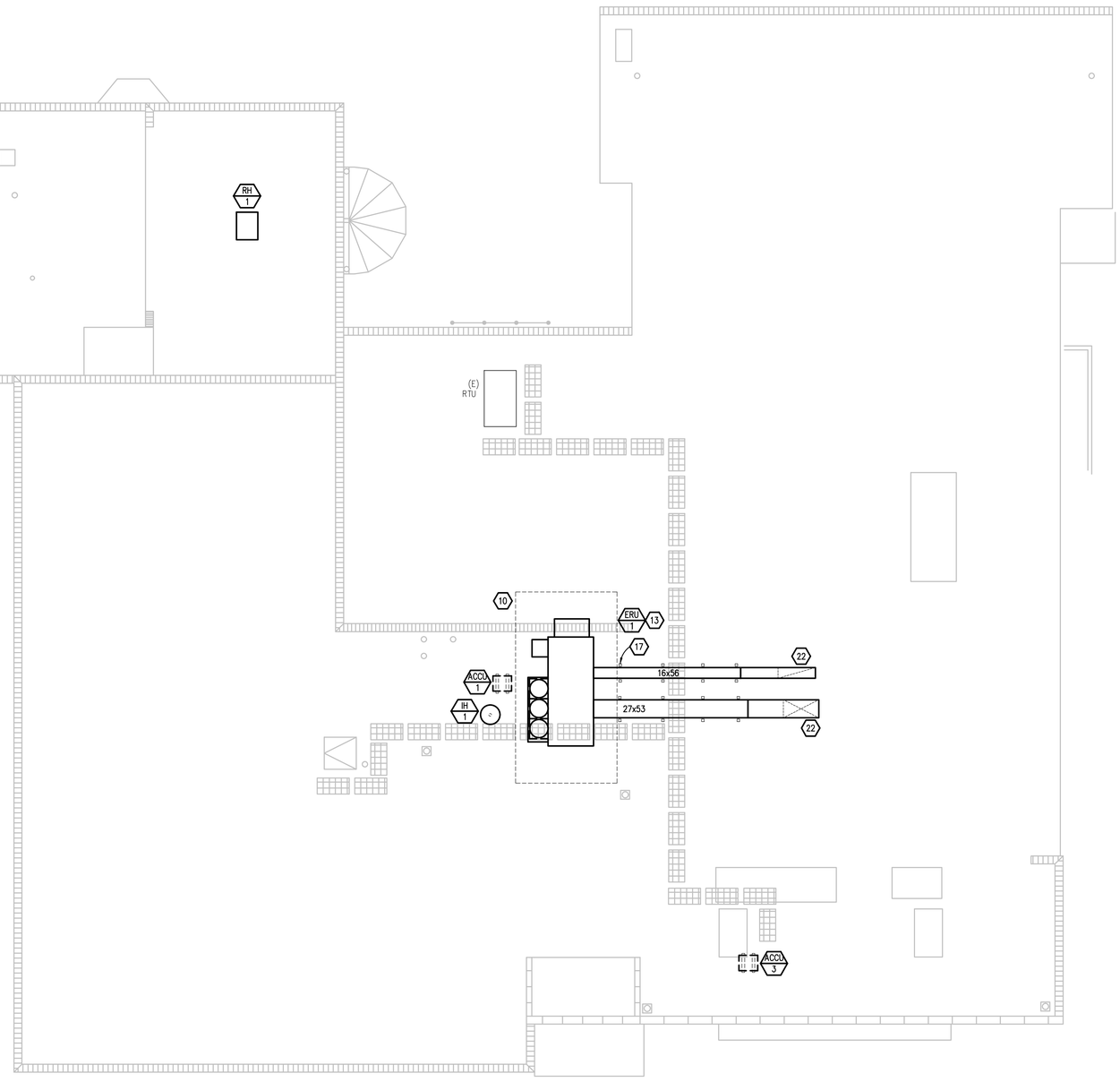
SHEET NAME
UPPER LEVEL SHEET METAL PLAN

SHEET NO.
M4-03

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



ROOF SHEET METAL PLAN
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SHEET NAME
ROOF SHEET METAL PLAN

SHEET NO.
M4-20

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

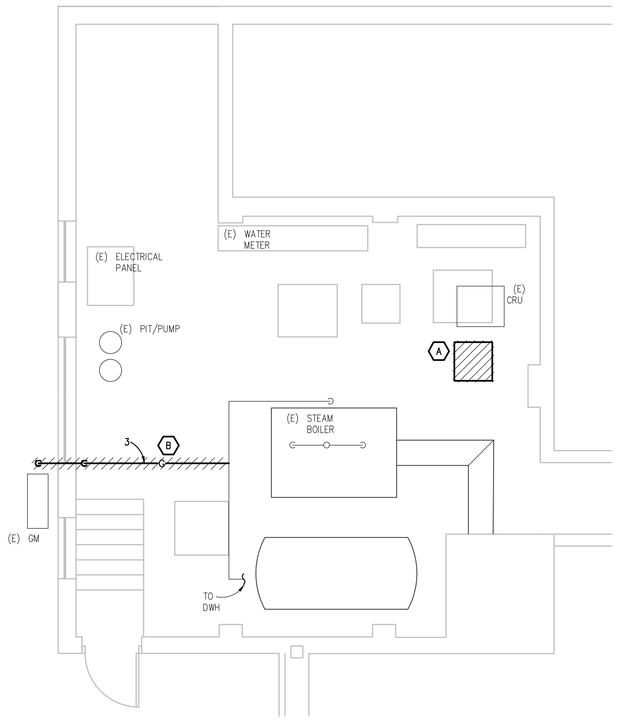
MECHANICAL DEMOLITION GENERAL NOTES:

1. ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.
2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. ACTUAL ROUTING AND SIZES OF EXISTING PIPING AND DUCTWORK MIGHT DIFFER TO A LIMITED EXTENT FROM WHAT IS SHOWN. MAJOR DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL EXISTING CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
3. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
4. ALL MECHANICAL ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETE, INCLUDING ALL RELATED ITEMS SUCH AS HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTWORK.

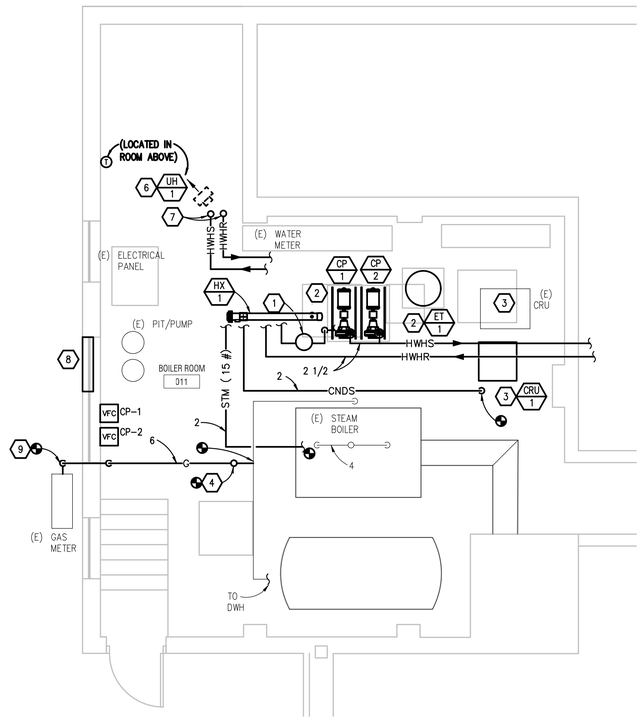
(#) DEMOLITION KEY NOTES:

A. REMOVE CONDENSATE RECEIVER UNIT COMPLETE. PREPARE STEAM AND CONDENSATE PIPING FOR NEW WORK.

B. REMOVE 3 GAS MAIN BACK TO METER.



ENLARGED MECHANICAL BOILER DEMOLITION PLAN
SCALE: 1/4" = 1' - 0"



ENLARGED MECHANICAL BOILER PLAN
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HVAC PIPING GENERAL NOTES:

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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. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

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(#) CONSTRUCTION KEY NOTES:

1. AIR/DIRT SEPERATOR.
2. NEW MECHANICAL EQUIPMENT TO SIT ON NEW CONCRETE HOUSEKEEPING PAD.
3. VENT CONDENSATE RECEIVER UP THRU ROOF AND TERMINATE MIN. 3 FEET ABOVE ROOF.
4. NEW 3 GAS PIPE WITH SHUTOFF VALVE UP THRU BOILER ROOM ROOF.
5. NEW CONDENSATE TO CONNECT INTO EXISTING CONDENSATE. FIELD VERIFY.
6. UNIT HEATER AND ASSOCIATED ROOM TEMPERATURE SENSOR LOCATED IN STORAGE ROOM ABOVE.
7. 1 HWHS & R PIPING GOES UP TO FEED UNIT HEATER LOCATED IN STORAGE ROOM ABOVE.
8. PROVIDE 36 x 30 COMBUSTION AIR LOUVER. COORDINATE WITH ARCHITECTURAL TRADES.
9. NEW 6 GAS MAIN. COORDINATE NECESSARY TRANSITION FLANGE WITH UTILITY COMPANY. REFER TO GAS PIPING DIAGRAM DETAIL.

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PBA Project No. 2022.0015

KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

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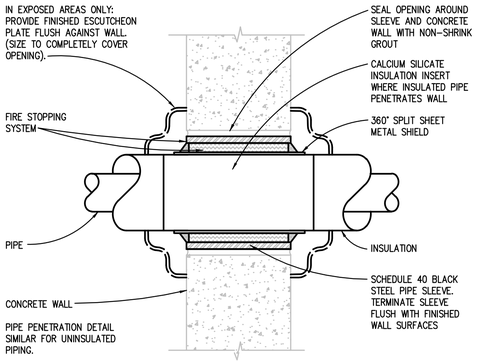
SHEET NAME
ENLARGED MECHANICAL BOILER PLANS

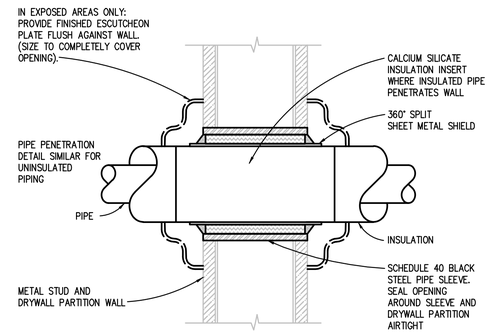
SHEET NO.
M5-01



DETAIL INDICATES THE INSTALLATION REQUIREMENTS FOR A FIRE RATED ASSEMBLY. FOR A NON-FIRE RATED ASSEMBLY PACK SLEEVED OPENING WITH INSULATION MATERIAL AND CAULK WITH NON-HARDENING SEALANT.

FIRE RATED AND NON-FIRE RATED POURED CONCRETE OR BLOCK WALL PIPE PENETRATION DETAIL

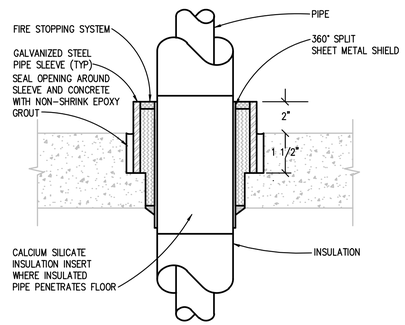
NO SCALE



DETAIL INDICATES THE INSTALLATION REQUIREMENTS FOR A FIRE RATED ASSEMBLY. FOR A NON-FIRE RATED ASSEMBLY PACK SLEEVED OPENING WITH INSULATION MATERIAL AND CAULK WITH NON-HARDENING SEALANT.

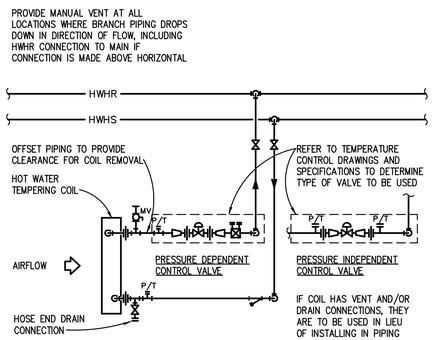
FIRE RATED AND NON-FIRE RATED METAL STUD AND DRYWALL PARTITION WALL PIPE PENETRATION DETAIL

NO SCALE



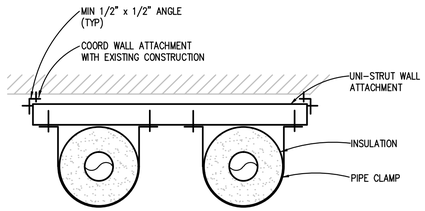
EXISTING FLOOR PIPE PENETRATION DETAIL

NO SCALE



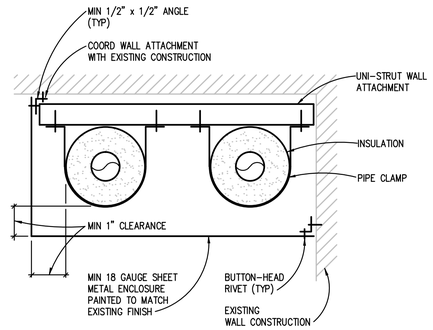
HOT WATER TEMPERING COIL WITH TWO-WAY CONTROL VALVE PIPING DIAGRAM - AC-1

NO SCALE



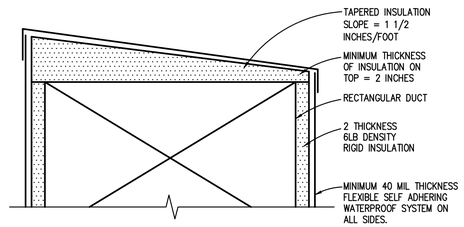
PIPE MOUNTING DETAIL

NO SCALE

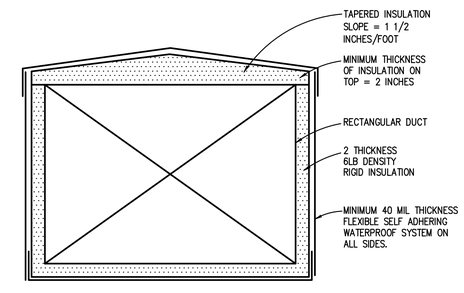


PIPE ENCLOSURE DETAIL

NO SCALE



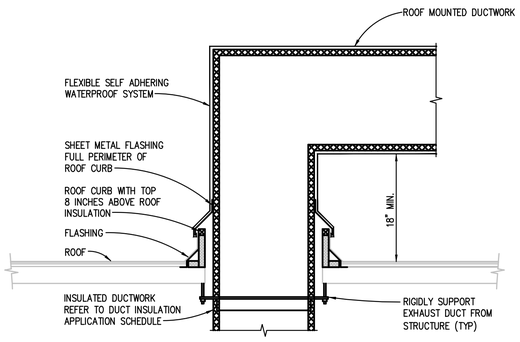
SLOPED IN ONE DIRECTION
OPTIONAL FOR DUCTS 30" AND SMALLER



SLOPED IN TWO DIRECTIONS

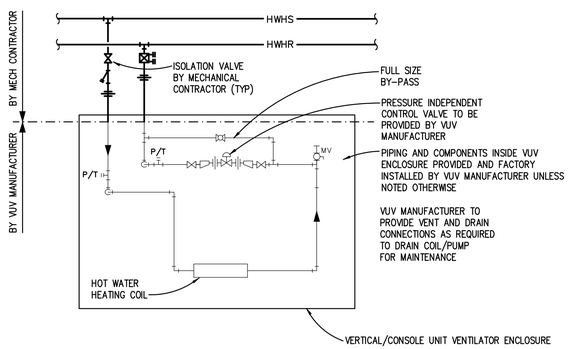
OUTDOOR DUCT INSULATION DETAIL

NO SCALE



DUCT PENETRATION THROUGH ROOF DETAIL

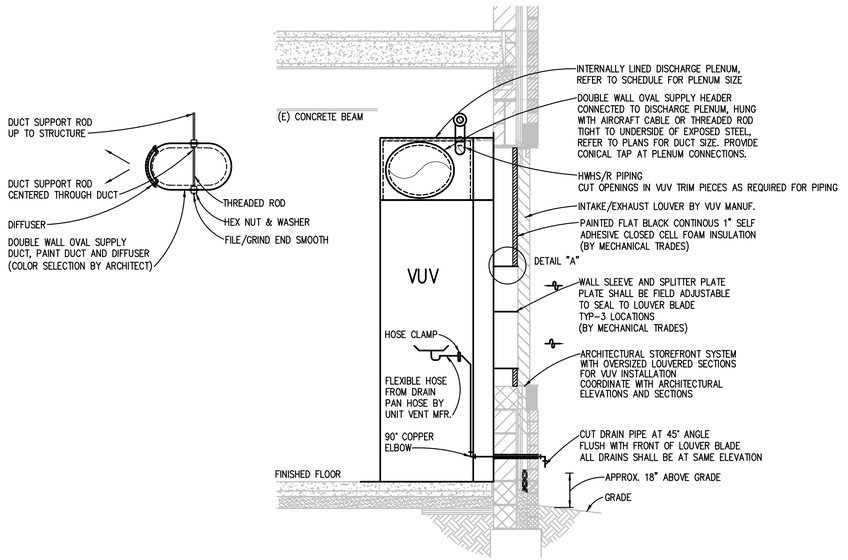
NO SCALE



NOTE:
1. ALL ISOLATION AND DRAIN VALVES SHALL BE BALL VALVES.
2. ALL COMBINATION BALANCE AND CONTROL VALVES SHALL BE VENTURI TYPE (MANUFACTURER = PRESO, FLOW DESIGN OR NEXUS).

VUV HOT WATER HEATING COIL WITH TWO-WAY CONTROL VALVE PIPING DIAGRAM

NO SCALE



VERTICAL UNIT VENTILATOR SECTION VUV/LOUVER DETAIL

NO SCALE

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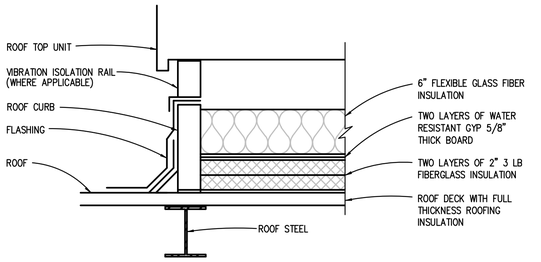
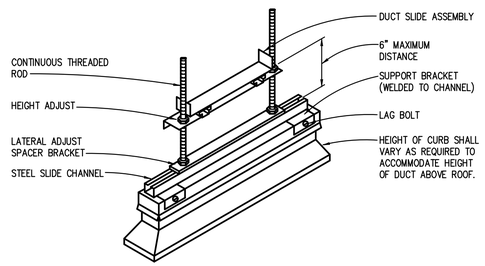
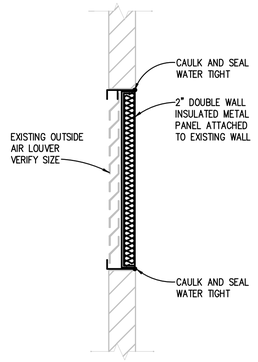


NOTE: ALL DUCT, PIPING, OR ELECTRICAL CONNECTIONS TO UNIT BELOW CURB SHALL HAVE FLEXIBLE CONNECTIONS. CUT INSULATION, GYP BOARD, ROOFING INSULATION, AND METAL DECKING PENETRATIONS TIGHT TO ITEM PENETRATING ROOF. PACK ALL PENETRATION OPENINGS WITH FLEXIBLE GLASS FIBER.

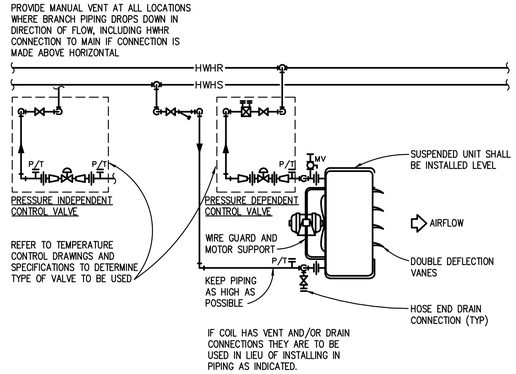
ROOF TOP UNIT CURB DETAIL
NO SCALE



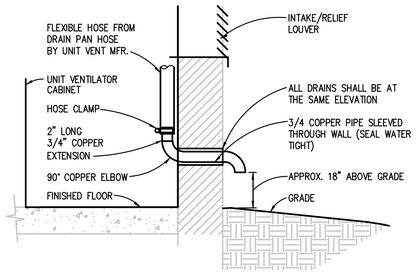
DUCT MOUNTING PEDESTAL DETAIL (ROOF MOUNTED DUCTWORK)
NO SCALE



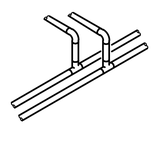
EXISTING EXTERIOR LOUVER AND/OR GRILLE CLOSURE DETAIL
NO SCALE



HOT WATER UNIT HEATER WITH TWO-WAY CONTROL VALVE PIPING DIAGRAM
NO SCALE

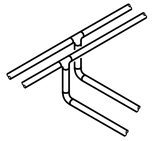


VERTICAL UNIT VENTILATOR CONDENSATE DRAIN DETAIL
NO SCALE



BRANCH CONNECTION OFF TOP

APPLIES TO THE FOLLOWING SYSTEMS:
DOMESTIC WATER
STEAM & CONDENSATE
NATURAL GAS

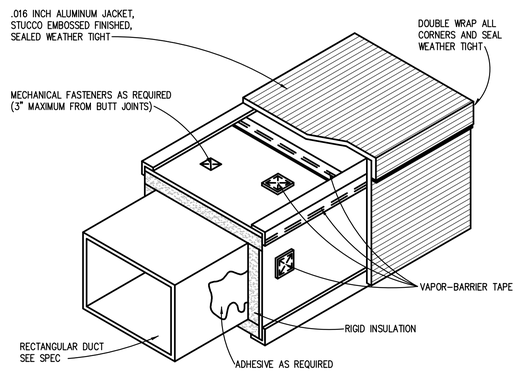


BRANCH CONNECTION OFF BOTTOM

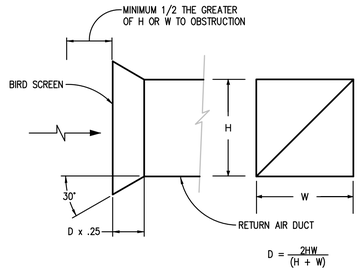
APPLIES TO THE FOLLOWING SYSTEMS:
HOT WATER HEATING

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

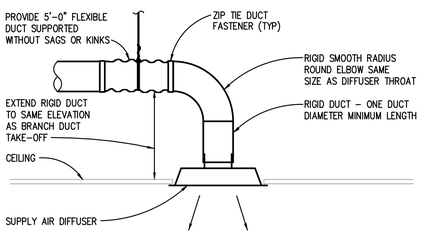
TYPICAL BRANCH TAKE-OFF CONNECTION PIPING DETAIL
NO SCALE



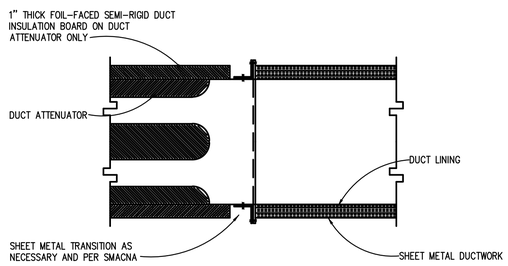
OUTDOOR DUCT INSULATION DETAIL
NO SCALE



BELLMOUTH DETAIL
NO SCALE

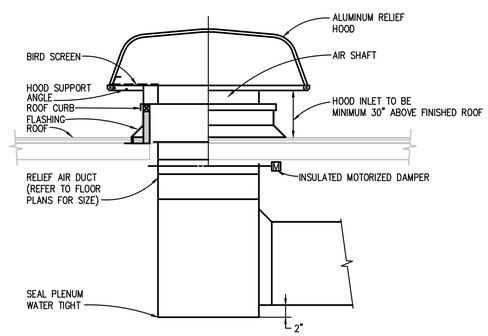


ROUND NECK SUPPLY AIR DIFFUSER DETAIL
NO SCALE



NOTE:
1. CONSTRUCT JUNCTION WITH INTERNAL DIMENSIONS OF LINING AND ATTENUATOR BEING EQUAL, TO CREATE SMOOTH AIRFLOW SURFACES WITH NO OBSTRUCTIONS AND NO EXPOSED EDGES OF LINING.

DUCT SILENCER JUNCTION DETAIL
NO SCALE



DUCTED INTAKE OR RELIEF HOOD INSTALLATION DETAIL
NO SCALE

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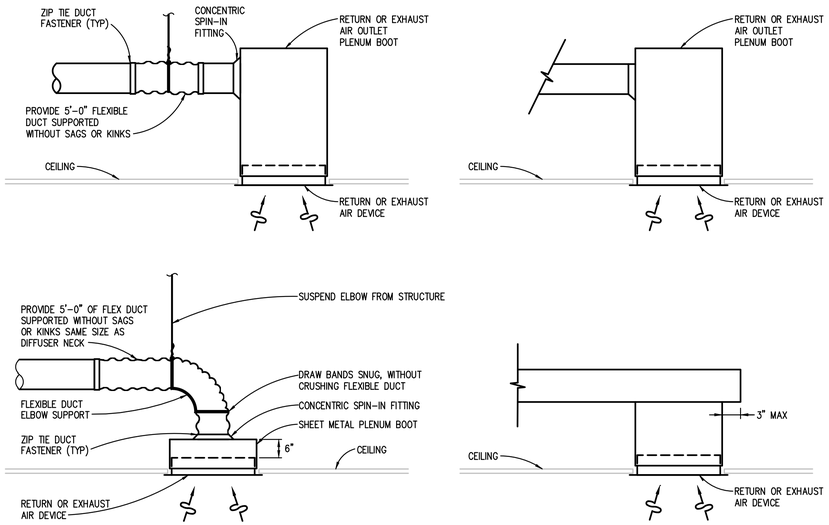
SHEET NAME
MECHANICAL DETAILS

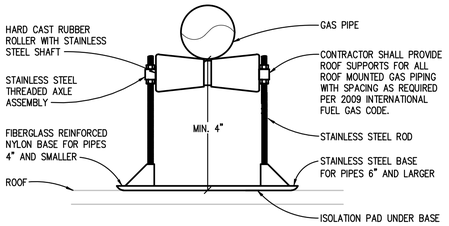
SHEET NO.
M6-02



RETURN OR EXHAUST AIR DEVICE INSTALLATION DETAIL

NO SCALE

NOTE: PAINT INTERIOR SURFACE OF PLENUM BOX FLAT BLACK.



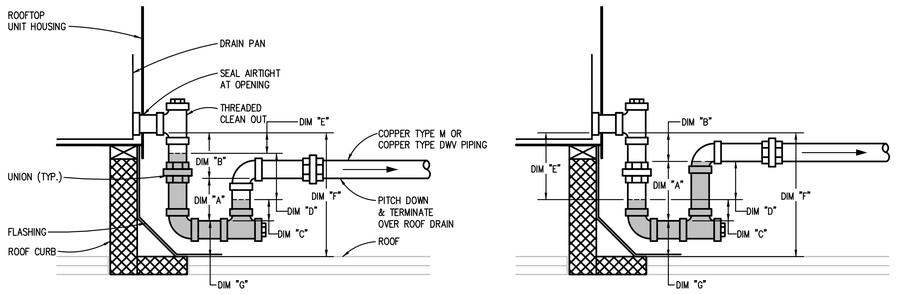
ROOF MOUNTED PIPE SUPPORT DETAIL

NO SCALE

TRAP DIMENSION TABLE

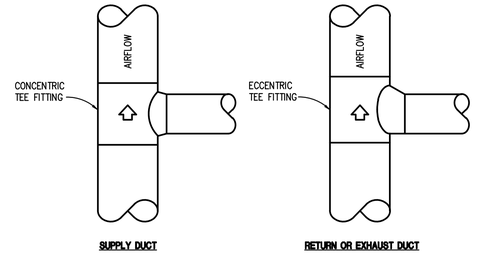
TYPE OF SYSTEM	S.P. AT DRAIN PAN (IN.) (NOTE A)	DIMENSION "A" (INCHES) MIN.	DIMENSION "B" (INCHES)	DIMENSION "C" (INCHES) (TRAP SEAL)	DIMENSION "D" (INCHES)	DIMENSION "E" (INCHES)	DIMENSION "F" (INCHES) DRAIN PIPE SIZE (INCHES)			
							1 1/2	2	2 1/2, 3	4
DRAW THROUGH	−5.1 TO −6	5.0	5.0	2	6	2	13.0	14.0	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 DRAIN PAN.
B. CONDENSATE DRAIN PAN TRAP PIPING SERVING ENERGY RECOVERY UNIT HEAT EXCHANGER AND HUMIDIFIER SECTIONS, WHERE LOCATED OUTDOORS, SHALL BE INSULATED AND HEAT TRACED.
C. DIMENSION "G" 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"



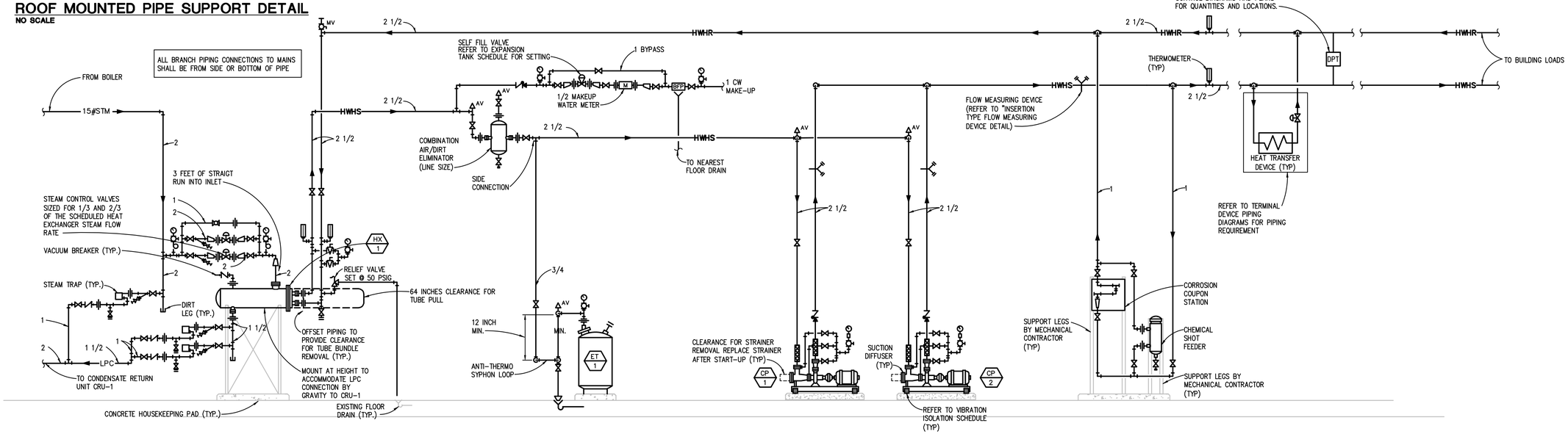
ROOFTOP AIR HANDLING/AIR CONDITIONING UNIT CONDENSATE DRAIN PAN TRAP DETAIL

NO SCALE



SPIRAL DUCT BRANCH TAKE-OFF DETAILS

NO SCALE **(ROUND AND FLAT OVAL SIMILAR)**



HOT WATER HEATING SYSTEM SCHEMATIC

NO SCALE

NOTES

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

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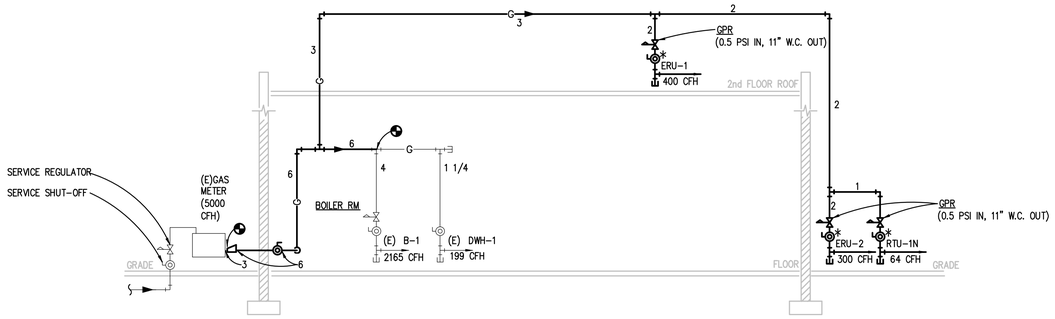
GAS LOAD SCHEDULE

ITEM	TOTAL CFH
(E) B-1	2165
(E) DWH-1	199
(N) ERU-1	400
(N) ERU-2	300
(N) RTU-1N	64
CONNECTED GAS LOAD = (ESTIMATED)	3,128 @ 0.5 PSI

*GAS TRAIN PROVIDED BY EQUIPMENT MANUFACTURER – SEE SPECIFICATIONS

**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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M6-04

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				
UP TO 2		X						X	X					X	X	X				
2-1/2 TO 4				X						X		X	X				X			A
2-1/2 TO 4		X							X				X	X	X		X			A
LOW PRESSURE STEAM - MAX. 15 PSIG STEAM WORKING PRESSURE																				
UP TO 2-1/2				X							X					X				C
3 TO 4				X						X		X						X		A
STEAM CONDENSATE - MIN. WORKING PRESS. & TEMP.: 125 PSIG AT 250 DEG F																				
UP TO 2					X						X					X				B
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 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.

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 (4X1)	PVC COATED GALV. SHEET METAL (1X4)	PVC COATED GALV. SHEET METAL (4X4)	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	
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.

ABOVEGROUND HVAC PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)				FIELD-APPLIED JACKET MATERIAL						
	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	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
LOW PRESS. STEAM, CONDENSATE & PUMPED CONDENSATE:											
NPS 1-1/4 AND SMALLER		2.5	2.5	3	X						A
NPS 1-1/2 AND LARGER		3	3	3	X						A
REFRIGERANT SUCTION & HOT GAS (RIGID COPPER)											
NPS 6 AND SMALLER	1	1			X		X				
REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)	1				X		X				
OUTDOOR (ABOVEGROUND) AND TUNNEL PIPE SYSTEM AND SIZE (INCHES)											
HEATING HOT WATER SUPPLY & RETURN 200 DEG F AND LOWER		3			X			X			
STEAM & CONDENSATE 350 DEG F AND BELOW		4	4		X						C
REFRIGERANT SUCTION & HOT GAS (RIGID COPPER)	2.5	2.5			X			X			B
REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)	2										B

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.

MECHANICAL EQUIPMENT INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD APPLIED JACKET MATERIAL		
	FLEXIBLE ELASTOMERIC	FIBERGLASS, LARGE DIAMETER PIPE & TANK	FIBERGLASS BOARD	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	PVC	KEYED NOTES
HEAT EXCHANGER (FOR HEATING SERVICE)		2	2			3	3	X	X	
HEATING WATER AIR SEPARATORS		2	2			3	3	X	X	
DEAERATORS, CONDENSATE TANKS & RECEIVERS, FLASH TANKS, FLASH SEPARATORS, AND BLOW-OFF TANKS		2	2			3	3	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.

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	ERU-1	8000	0.18	0.25	1108	8	12	20	40	48	43	26	21	38	38	60	RS	STANDARD	FIBERGLASS	22 GA. GALV.	22 GA. GALV.	RM60/1D	NC 30
DS-1R	ERU-1	4000	0.16	0.25	1560	7	9	17	30	37	30	22	17	24	36	48	RS	STANDARD	FIBERGLASS	22 GA. GALV.	22 GA. GALV.	RH48/1D	NC 30
DS-2R	ERU-1	4000	0.16	0.25	1560	7	9	17	30	37	30	22	17	24	36	48	RS	STANDARD	FIBERGLASS	22 GA. GALV.	22 GA. GALV.	RH48/1D	NC 30
DS-2S	ERU-2	4200	0.13	0.25	1163	7	11	19	36	45	37	28	20	52	10	60	RS	STANDARD	FIBERGLASS	22 GA. GALV.	22 GA. GALV.	RH60/1E	NC 30
DS-3R	ERU-2	4200	0.18	0.25	1400	7	12	21	35	37	25	18	14	36	12	60	RS	STANDARD	FIBERGLASS	22 GA. GALV.	22 GA. GALV.	RH60/1D	NC 30

GENERAL NOTES:
1. DUCT SILENCER MODEL NUMBERS ARE BASED ON PRICE 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.
7. FIELD VERIFY EXACT REQUIRED DIMENSIONS.
8. FABRICATE SILENCER CASINGS OF STAINLESS STEEL WHERE SILENCERS ARE CONNECTED TO A PVC COATED OR STAINLESS STEEL DUCT SYSTEM.

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 FOLLOWNG 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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KEY PLAN

OWNER
Hamtramck Public Schools

PROJECT NAME
HVAC Improvements Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.
22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

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APPROVED BY
SVM

SHEET NAME
MECHANICAL SCHEDULES

SHEET NO.
M7-01

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							
ROUND & FLAT OVAL SUPPLY AIR IN MECHANICAL ROOMS		1.5								
RECTANGULAR RETURN AIR IN MECHANICAL EQUIPMENT ROOMS			1.5							
ROUND RETURN AIR IN MECHANICAL ROOMS		1.5								
OUTSIDE AIR AND MIXED AIR, EXCEPT AS NOTED BELOW		1.5								
RECTANGULAR OUTSIDE AIR AND MIXED AIR IN MECHANICAL ROOMS			1.5							
ROUND OUTSIDE AIR AND MIXED AIR IN MECHANICAL 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							
ROUND & FLAT OVAL 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	
ROUND & FLAT OVAL SUPPLY AIR	3				2				X	D
ROUND & FLAT OVAL RETURN & EXHAUST AIR	3				2				X	D

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.

HORIZONTAL PIPING AND SUPPORT APPLICATION SCHEDULE

	HANGER OR SUPPORT TYPE						SHIELD TYPE			
METAL PIPE TYPE & SIZE	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	KEYED NOTES
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	
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

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.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

UNIT IDENTIFICATION	TYPE	FACE SIZE	NECK SIZE	FRAME TYPE	ACCESSORY	CONSTRUCTION	FINISH	MODEL NUMBER	KEYED NOTES
S-1	DIFFUSER	24"x24"	SEE PLANS	LAY-IN	–	STEEL	WHITE	SPD	
S-2	DIFFUSER	24"x24"	SEE PLANS	LAY-IN	–	STEEL	WHITE	VPD	NOT USED
S-3	GRILLE	16"x8"	SEE PLANS	SURFACE MOUNT	–	STEEL	WHITE	SDGE	2.
S-4	GRILLE	22"x8"	SEE PLANS	SURFACE MOUNT	–	STEEL	WHITE	500	2.
S-5	GRILLE	18"x8"	SEE PLANS	SURFACE MOUNT	–	STEEL	WHITE	540	2.
R-1	GRILLE	24"x12"	SEE PLANS	LAY-IN	–	STEEL	WHITE	80	
R-2	GRILLE	24"x24"	22"x22"	LAY-IN	–	STEEL	WHITE	80	
R-3	GRILLE	36"x14"	SEE PLANS	SURFACE MOUNT	–	STEEL	WHITE	500	
T-1	GRILLE	24x12	SEE PLANS	SURFACE MOUNT	–	STEEL	WHITE	500	

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

KEYED NOTES:
1. SMART DIFFUSER
2. DOUBLE DEFLECTION

STEAM TO WATER HEAT EXCHANGER SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	FOULING FACTOR	CAPACITY MBH	WATER				STEAM				MODEL NUMBER	KEYED NOTES
					FLOW GPM	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D. FT. HEAD	INLET PRESS PSIG AT CONTROL VALVE	CONTROL VALVE P.D. PSIG	INLET PRESSURE PSIG AT UNIT	FLOW LBS/HR		
HX-1	CLASSROOMS	SHELL & TUBE	0.0005	665.8	50	120	150	11.5	15	5	10	695.4	QSU-45-2	

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

STEAM CONDENSATE RETURN UNIT SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	BOILER FEED PUMP					VACUUM PUMP			RECEIVER		MODULATION/ CONTROL TYPE	ELECTRICAL				VACUUM/UNIT MODEL NUMBER	KEYED NOTES
			QUANTITY	FLOW EACH GPM	DISCHARGE PRESSURE PSIG	HP EACH	RPM	CFM @5.5 INCHES HG @ 160° F	HP	RPM	TYPE	CAPACITY GALLON		VOLTS	PHASE	SCCR kA	OPTIONS/ ACCESSORIES		
CRU-1	(E) B-1	SINGLE	1	8	22	1/3	3500	29.4		1750	CAST IRON	6	AUTO	120	1	10	B	WCS 6-20B	1

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE BELL AND GOSSETT VCMD STYLE CMHD-A UNLESS OTHERWISE NOTED.

KEYED NOTES:
1. UNIT TO COME WITH MAGNETIC STARTER

AIR-COOLED CONDENSING UNIT SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TOTAL CAPACITY MBH	MINIMUM EER	REFRIGERATION TYPE	NUMBER OF CIRCUITS	NUMBER OF CONTROL STAGES	CONDENSER		SUCTION TEMPERATURE °F	CONDENSER FAN		COMPRESSOR		MODULATION/ CONTROL TYPE	WEIGHT (LBS.)	ELECTRICAL						MODEL NUMBER	KEYED NOTES
							DESIGN AMBIENT TEMPERATURE °F	MINIMUM AMBIENT TEMPERATURE °F		QUANTITY	HP EACH	NUMBER OF COMPRESSORS	TYPE OF COMPRESSOR			VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS/ ACCESSORIES		
ACCU-2	UV-10	36.0	14	R-410A	1	1	95	45	40	1	1/8	1	SCROLL	AUTO	160	208	3	12	20	5	B	4TTA4036	1

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE TRANE 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.

KEYED NOTES:
1. UNIT TO SIT ON PATE RAILS

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KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

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SHEET NAME
MECHANICAL SCHEDULES

SHEET NO.
M7-02

ENERGY RECOVERY UNIT SCHEDULE - PART A

UNIT IDENT-IFICATION	SUPPLY FAN							EXHAUST FAN						HEAT EXCHANGER (SUMMER)								HEAT EXCHANGER (WINTER)								COOLING SECTION – DX									INTEGRAL AIR-COOLED CONDENSING SECTION			HEATING SECTION – GAS FIRED (NATURAL GAS)							HOT GAS REHEAT COIL (HEAT RECLAIM)		
	CFM	MIN. OA CFM SUMMER/ WINTER	ESP"	TSP"	CONTROL TYPE	MOTOR		CFM SUMMER/ WINTER	ESP"	TSP"	CONTROL TYPE	MOTOR		SUPPLY SIDE			EXHAUST SIDE			EFFIC. (%)	SUPPLY SIDE			EXHAUST SIDE			EFFIC. (%)	MIXED AIR		UNIT LEAVING AIR		UNIT NET CAPACITY		NUMBER OF CIRCUITS	REFRIG. TYPE	MAX FACE VEL. F.P.M.	DESIGN AMBIENT TEMP °F	MIN. AMBIENT TEMP °F	NO. OF CAPACITY CONTROL STAGES	AIR TEMP.		CAPACITY (MBH)		GAS PRESSURE TO GAS TRAIN IN. W.C.	MAXIMUM ALLOWABLE OUTPUT AT MINIMUM FIRING RATE (MBH)	MIN. NO. OF CAPACITY CONTROL STAGES	CAPACITY TOTAL MBH	E.W.B. °F	L.D.B. °F
						BHP	HP					BHP	HP	E.A.T. °F	L.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	L.A.T. °F	A.P.D. IN. WG.	E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.		E.D.B. °F	E.W.B. °F	L.D.B. °F	L.W.B. °F	TOTAL MBH	SENSIBLE MBH							E.A.T. °F	L.A.T. °F	INPUT	OUTPUT						
ERU-1	8000	3000/3000	1.75	4.304	VFD	8.58	10	3000	0.5	1.41	VFD	1.12	7.5	91.0	79.4	0.16	75.0	86.4	–	63	-10.0	51.6	0.19	72.0	11.0	–	71	76.3	63.6	55.2	54.4	220.8	185.5	1	R-410A	396	95	45	MODULATING	64.3	101.3	400	320	6–14	25	16:1 MOD.	144	66.0	75.1
ERU-2	4200	2730/2730	1.5	3.788	VFD	4.11	5	2730	0.5	1.796	VFD	1.44	5	91.0	79.6	0.16	75.0	86.2	–	68	-10.0	45.8	0.19	72.0	15.4	–	67	78	64.7	55.8	55.1	123.8	102.1	1	R-410A	356	95	45	MODULATING	55	107.9	300	240	6–14	20	16:1 MOD.	107	66.0	71.8

NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE VALENT UNLESS OTHERWISE NOTED.
3. COORDINATE UNIT CONFIGURATION WITH PLANS IN ORDER TO ALLOW FOR PROPER SERVICE ACCESS.
4. PROVIDE SINGLE POINT ELECTRICAL CONNECTION WITH MAIN DISCONNECT.
5. REFER TO VIBRATION ISOLATOR APPLICATION SCHEDULE.

ENERGY RECOVERY UNIT SCHEDULE - PART B

UNIT IDENT-IFICATION	OUTSIDE AIR FILTERS			RETURN FILTERS			CURB			UNIT WEIGHT w/ CURB (LBS.)	SA/RA CONFIG.	EA/OA CONFIG.	ELECTRICAL						MODEL NO.	REMARKS
							TYPE		HEIGHT				VOLTS	PHASE	MCA	MOP	SCCR KA	OPTIONS/ ACCESS-ORIES		
	EFF. %	AREA SQ. FT.	SP" TOTAL	EFF. %	AREA SQ. FT.	SP" TOTAL	STANDARD	VIBRATION ISOLATION SPRING CURB (NOTE 5)												
ERU-1	30	8	0.4	30	16	0.62	NO	NO	–	4950	SIDE/SIDE	SIDE	208	3	129	150	22	B	VXE-212-52B-17.5I-M-A0	UNIT TO SIT ON 1 INCH OF NEOPRENE ON STRUCTURAL STEEL SUPPORT
ERU-2	32	2.78	0.4	32	2.78	0.61	NO	NO	–	3350	SIDE/SIDE	SIDE	208	3	79	110	22	B	VXE-112-41D-10I-J-D1	UNIT TO SIT ON 6 INCH CONCRETE HOUSEKEEPING PAD

NOTE: SEE NOTES UNDER PART "A"

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 1/2	57	0.7	12	160	STANDARD VELOCITY / AIR & DIRT	VDN 250 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.

UNITARY ROOFTOP AIR CONDITIONING UNIT SCHEDULE

UNIT I.D.	AREA SERVED	SUPPLY FAN							EXHAUST/RELIEF FAN					COOLING SECTION – DX								INTEGRAL AIR-COOLED CONDENSING SECTION			HEATING SECTION – GAS FIRED (NATURAL GAS)						FILTER SECTION				ROOF CURB		MAXIMUM UNIT DIMENSIONS			MAXIMUM UNIT OPERATING WEIGHT LBS. (WITH CURB)	TOTAL UNIT ELECTRICAL						MODEL NO.	KEYED NOTES
		AIRFLOW CFM	MINIMUM OUTSIDE AIR FLOW CFM	E.S.P. IN. W.G.	T.S.P. IN. W.G.	FAN SPEED RPM	BHP	HP	AIRFLOW CFM	E.S.P. IN. W.G.	FAN SPEED RPM	BHP	HP	MIXED AIR		UNIT LEAVING AIR		NET UNIT CAPACITY		NUMBER OF CIRCUITS	REFRIG. TYPE	MAX. FACE VEL. F.P.M.	DESIGN AMBIENT TEMP °F	MIN. AMBIENT TEMP. °F	NO. OF CAPACITY CONTROL STAGES	AIR TEMP.		CAPACITY (MBH)		MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	MAXIMUM ALLOWABLE OUTPUT AT MINIMUM FIRING RATE (MBH)	MIN. NO. OF CAPACITY CONTROL STAGES	TYPE	MERV	AIR PRESS. DROP		TYPE		HEIGHT	LENGTH	HEIGHT (WITH CURB)	WIDTH		VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS/ ACCESSORIES		
														E.D.B. °F	E.W.B. °F	L.D.B. °F	L.W.B. °F	TOTAL MBH	SENSIBLE MBH							E.A.T. °F	L.A.T. °F	INPUT	OUTPUT						INITIAL IN. W.G.	FINAL IN. W.G.	STANDARD	VIBRATION ISOLATION SPRING CURB														
RTU-1N	LOWER LEVEL CLASSROOMS 006 & 007	1000	375	0.75	1.5	2035	0.89	4	1600	0.5	1276	0.20	4	82.6	69	56.3	56.2	36.36	27.36	1	R-410A	248.3	95	45	2	45	84.3	64	56	5/14	12	5	PLEATED	8	0.01	0.07	YES	NO	14	74	47.7	36	975	208	3	31	40	5	B	48GCUN04K3M5-2WHQ0	1,2

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE CARRIER 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.
4. MERV DESIGNATES THE "MINIMUM EFFICIENCY REPORTING VALUE" AS EVALUATED UNDER ASHRAE STANDARD 52.2 1999.
5. AIR HANDLING UNIT 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.

KEYED NOTES:
1. UNIT TO COME WITH HOT GAS REHEAT
2. UNIT TO SIT ON 4 INCH CONCRETE HOUSEKEEPING PAD

UNIT VENTILATOR SCHEDULE

UNIT TYPE	FAN					COOLING COIL							HEATING COIL							ARRANGEMENT	MODULATION/ CONTROL TYPE	ELECTRICAL							MODEL NUMBER	KEYED NOTES
						MINIMUM TOTAL CAPACITY MBH	AIR			DIRECT EXPANSION			MINIMUM TOTAL CAPACITY MBH	AIR		WATER							VOLTS	PHASE	FLA	MCA	MOP	SCCR KA	OPTIONS/ ACCESSORIES		
	CFM	MINIMUM O.A. CFM	E.S.P. IN. WG.	NUMBER FANS	H.P. EACH		E.D.B. °F	L.D.B. °F	L.W.B. °F	NO. OF CIRCUITS	MAX. FACE VEL. F.P.M.	REFRIGERANT		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											
VUV-A	1100	400	0.5	1	0.75	36.0	80	57.0	56.5	2	499	R-410A	65.5	42	93	4.5	150	120	0.89	11.5	VERT	AUTO	208	3	18.1	21	30	10	B	CMD 36	
UV-B	1000	400	0.0	1	0.75	33.17	80	57.0	56.5	2	499	R-410A	57.2	39	94	3.5	150	120	2.62	11.5	CONSOLE	AUTO	120	1	3.2	3.9	15	10	B	UAVV9S10	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MANUFACTURER BASED ON AIREDALE (VERTICAL UNITS), DAIKIN (CONSOLE UNITS) UNLESS OTHERWISE INDICATED.

EXPANSION TANK SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	ESTIMATED TOTAL SYSTEM VOLUME GALLONS	TYPE	FLUID TYPE	SYSTEM FILL VALVE OR GLYCOL PUMP PRESSURE SETTING PSIG	OPERATING PRESSURES AT EXPANSION TANK		SYSTEM OPERATING TEMPERATURES		EXPANSION VOLUME GALLONS	ACCEPTANCE FACTOR	MINIMUM TANK VOLUME GALLONS	DIMENSIONS		MODEL NUMBER	KEYED NOTES
						PRE-CHARGE PSIG	MAX (OPERATING) PSIG	MINIMUM °F	MAXIMUM °F				DIAMETER INCHES	HEIGHT INCHES		
ET-1	HOT WATER HEATING	350	BLADDER	WATER	17	16	47	120	156	53	1.0	53	24	37	B-200	

GENERAL NOTES:
1. MODEL NUMBERS ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL PRE-CHARGE THE TANK TO THE VALUE INDICATED IN THE SCHEDULE. FOR TANKS THAT ARE SUPPLIED PRE-CHARGED BY THE MANUFACTURER, THE CONTRACTOR SHALL CONFIRM THE PRESSURE AND MAKE ADJUSTMENTS AS REQUIRED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

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	SCCR KA	OPTIONS/ ACCESSORIES		
CP-1	HWH SYSTEM	BOILER RM	END SUCTION	FLEXIBLE	50	WATER	40	50	NON-OVERLOADING	54	1.05	2	1750	VFC	208	3	14	–	e-1510 1.25AD	
CP-2	HWH SYSTEM	BOILER RM	END SUCTION	FLEXIBLE	50	WATER	40	50	NON-OVERLOADING	54	1.05	2	1750	VFC	208	3	14	–	e-1510 1.25AD	

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.

UNIT I.D.	MAXIMUM SOUND POWER LEVELS 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	82	82	78	75	73	68	61	54

UNIT VENTILATOR APPLICATION SCHEDULE

UNIT IDENTIFICATION	UV TYPE	LOCATION / AREA SERVED	OPTIONS	CONTROL VALVE TYPE	KEYED NOTES
VUV-1	A	CLASSROOM	A, B, C, I	2-WAY	
VUV-2	A	CLASSROOM	A, B, C, I	2-WAY	
VUV-3	A	CLASSROOM	A, B, C, I	2-WAY	
VUV-4	A	CLASSROOM	A, B, C, I	2-WAY	
VUV-5	A	CLASSROOM	A, B, C, I	2-WAY	
VUV-6	A	CLASSROOM	A, B, C, G, I	2-WAY	
VUV-7	A	CLASSROOM	A, B, C, G, I	2-WAY	
VUV-8	A	CLASSROOM	A, B, C, G, I	2-WAY	
VUV-9	A	CLASSROOM	A, B, C, G, I	2-WAY	
UV-10	B	CLASSROOM	D	2-WAY	

NOTE:
1. OPTIONS TO BE PROVIDED BY UV MANUFACTURER. IF NOT AVAILABLE FROM VUV MANUFACTURER, CONTRACTOR SHALL PROVIDE EQUIVALENT IN THE FIELD.
   A. 6 INCH REAR EXTENSION WITH SPLITTER PLATE.
   B. WALL SLEEVE WITH SPLITTER PLATE.
   C. WALL/CORNER/MULLION TRIM (PREFINISHED METAL CLOSURE PANEL). FIELD VERIFY DIMENSIONS.
   D. MANUFACTUER'S SHEET METAL CABINETRY ON EACH SIDE OF UV
   E. 36 INCH HIGH SUPPLY AIR PLENUM FOR ATTACHING DOUBLE WALL SPIRAL DUCTWORK. REFER TO ARCHITECTURAL FOR MOUNTING HEIGHTS
   F. CONDENSATE RISER KIT.
   G. 8x4 INCH HYDRONIC PIPING ENCLOSURE (FROM CEILING TO FLOOR –EXTERIOR TO VUV)
   H. 6 INCH RAISED BASED.
   I. FLANGED LOUVER BY UNIT MANUFACTURER FOR INSTALLATION IN WINDOW FRAMING SYSTEM. REFER TO ARCHITECTURAL ELEVATIONS FOR SIZE.

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SHEET NAME
MECHANICAL SCHEDULES

SHEET NO.
M7-03

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE

INDOOR UNIT																		OUTDOOR UNIT																
UNIT IDENTIFICATION	TOTAL CAPACITY MBH	EVAPORATOR FAN				DX COOLING COIL			HOT WATER HEATING COIL		ELECTRIC HEATING COIL	FILTER		ELECTRICAL				MODEL NUMBER	UNIT IDENTIFICATION	CONDENSING SECTION					MODULATION/ CONTROL TYPE	ELECTRICAL					MODEL NUMBER	KEYED NOTES
		AIRFLOW CFM (HI/MED/LO)	OUTSIDE AIR (CFM)	NUMBER FANS	WATTS EACH	E.D.B. °F	E.W.B. °F	REFRIGERANT	GPM	E.W.T./L.W.T. °F	kW	MERV	TYPE	VOLTS	PHASE	FLA	MOP			NUMBER OF COMPRESSORS	NUMBER OF CONTROL STAGES	AMBIENT TEMPERTURE °F	AIRFLOW CFM	FAN WATTS		VOLTS	PHASE	FLA	MOP	SCCR KA		
AC-1	18.0	590/465/268	60	1	73	80	67	R-410A	3.0	150/120	–	10	DISPOSABLE	208	1	0.55	15	CSD18	ACCU-1	1	MODULATING	95	985	39	AUTO	208	1	10.4	15	22	YCE18	1,2,3
AC-3	18.0	590/465/268	60	1	73	80	67	R-410A	–	–	3.0	10	DISPOSABLE	208	1	12.35	15	CSD18	ACCU-3	1	MODULATING	95	985	39	AUTO	208	1	12	20	22	YCE18	1,2,3
AC-4	18.0	590/465/268	60	1	73	80	67	R-410A	–	–	3.0	10	DISPOSABLE	208	1	12.35	15	CSD18	ACCU-4	1	MODULATING	95	985	39	AUTO	208	1	12	20	22	YCE18	1,3,4

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS AIREDALE UNLESS OTHERWISE NOTED.
3. UNITS ARE ABLE TO OPERATE DOWN TO –10 °F.

KEYED NOTES:
1. PROVIDE CONDENSATE PUMP.
2. CONDENSER ON ROOF TO SIT ON PATE RAILS.
3. UNIT TO COME WITH ELECTRO-MECHANICAL CONTROL OPTION TO BE CONNECTED TO BUILDING MANAGEMENT SYSTEM
4. CONDENSER TO BE MOUNTED ON BRACKETS ON SIDEWALL ON VIBRATION ISOLATION PADS.

INTAKE HOOD SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	CFM	THROAT SIZE INCHES	THROAT VELOCITY FPM	STATIC PRESSURE DROP IN. W.G.	HOOD SIZE INCHES	CURB HEIGHT INCHES	HOOD CONSTRUCTION	MODEL NUMBER	KEYED NOTES
IH-1	AC-1	60	8	203	0.007	20.5	18	ALUMINUM	GRSI-8	

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

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	SCCR KA	OPTIONS/ ACCESSORIES		
UH-1	15	350	85	1/20	–	0.75	W	160	120	4.5	11	AUTO	115	1	5	B	HS-SERPENTINE	

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

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				MODEL NUMBER	KEYED NOTES
							BHP	HP	RPM	DRIVE TYPE			VOLTS	PHASE	SCCR KA (NOTE 3)	OPTIONS/ ACCESSORIES		
EF-1	TOILET RM	INLINE	500	0.4	–	2615	0.08	1/4	1725	DIRECT	–	AUTO	120	1	5	A	USF-10	
EF-2	TOILET RM	INLINE	100	0.05	–	–	0.11	1/4	950	DIRECT	–	AUTO	120	1	5	A	CSP-B110	2, 3
EF-3	TOILET RM	SIDEWALL PROPELLER	375	0.05	–	–	0.02	1/4	1550	DIRECT	–	AUTO	120	1	5	A	SE1-12-424-D	
EF-4	TOILET RM	SIDEWALL PROPELLER	225	0.05	–	–	0.02	1/4	1550	DIRECT	–	AUTO	120	1	5	A	SE1-8-440-E	
EF-5	TOILET RM	SIDEWALL PROPELLER	375	0.05	–	–	0.02	1/4	1550	DIRECT	–	AUTO	120	1	5	A	SE1-12-424-D	
EF-6	TOILET RM	SIDEWALL PROPELLER	225	0.05	–	–	0.02	1/4	1550	DIRECT	–	AUTO	120	1	5	A	SE1-8-440-E	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.
3. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

KEYED NOTES:
1. UNIT TO COME WITH FAN GUARD AND WALL COLLAR
2. PROVIDE BACKDRAFT DAMPER.
3. MOUNT IN WINDOW WELL

GRAVITY RELIEF HOOD SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	CFM	THROAT SIZE FT^2	THROAT VELOCITY FPM	STATIC PRESSURE DROP IN. W.G.	HOOD SIZE			CURB HEIGHT INCHES	HOOD CONSTRUCTION	MODEL NUMBER	KEYED NOTES
						WIDTH INCHES	LENGTH INCHES	HEIGHT INCHES				
RH-1	UV-10	1000	3.4	298	0.02	36	32	19	18	AUMINUM	FGR	

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

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)	
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)	
PROPELLER FANS	WALL-MOUNTED ROOF EXHAUSTER	ALL ALL	ALL ALL	A A	1a OR 1b 1a OR 1b	0.25 (6) 0.25 (6)	A D OR E	1a OR 1b 4	0.25 (6) 1.50 (38)	NOTE 4
SUSPENDED HEAT PUMPS, FAN COILS, CONDENSING UNITS, COMPUTER ROOM UNITS, LOCATED INDOORS.	ALL	ALL	ALL				A OR B	8a OR 8b	1.50 (38)	NOTES 1, 3, 4
BASE MOUNTED CONDENSING UNITS	ALL ALL	≤1HP >1HP	ALL ALL	A OR B A OR B	2 2	0.25 (6) 0.25 (6)	A OR B A OR B	2 4	0.25 (64) 2.50 (64)	NOTE 3
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
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.

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KEY PLAN

OWNER

Hamtramck
Public Schools

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Phase 2
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SHEET NAME
MECHANICAL SCHEDULES

SHEET NO.
M7-04

TEMPERATURE CONTROL - SYMBOLS LIST

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
CS	CURRENT SWITCH
	DAMPER – PARALLEL BLADE
M	DAMPER MOTOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
FS	FLOW SWITCH
FZ	FREEZESTAT
	GUARD FOR STAT OR SENSOR
H	SPACE HUMIDITY SENSOR
H	HUMIDITY SENSOR, DUCT MOUNTED
	LINE – ELECTRIC
	LINE – PNEUMATIC
M	MAIN AIR
M/S	MOTOR STARTER
OS	OCCUPANCY SENSOR
R	RELAY, ELECTRIC
AI	SIGNAL – DDC/BAS, ANALOG INPUT
AO	SIGNAL – DDC/BAS, ANALOG OUTPUT
DI	SIGNAL – DDC/BAS, DIGITAL INPUT
DO	SIGNAL – DDC/BAS, DIGITAL OUTPUT

SCHEMATIC SYMBOLS (CONT.)

SYMBOL	DESCRIPTION
DD	SMOKE DETECTOR – DUCT MOUNTED
S/S	START/STOP RELAY
SP	STATIC PRESSURE SENSOR OR PROBE
T	TEMPERATURE SENSOR – DUCT MOUNTED AVG ELEMENT
T	TEMPERATURE SENSOR – DUCT MOUNTED RIGID ELEMENT
T	THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)
	VALVE – 2 WAY CONTROL VALVE
	VALVE – 3 WAY CONTROL VALVE
VFC	VARIABLE FREQUENCY CONTROLLER

WIRING SYMBOLS

SYMBOL	DESCRIPTION
M/S	COIL – MOTOR STARTER CONTACTOR
R	COIL – RELAY
	CONTACT – INSTANT OPERATING, NO
	CONTACT – INSTANT OPERATING, NC
	GROUND
	MOTOR, SINGLE PHASE

WIRING SYMBOLS (CONT.)

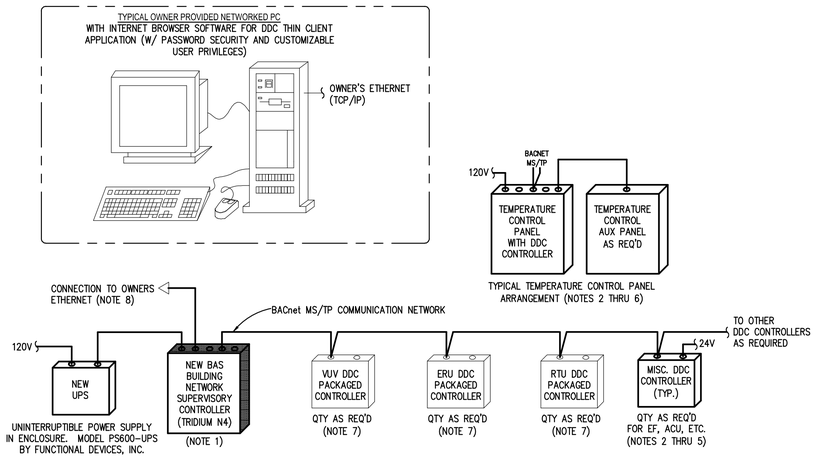
SYMBOL	DESCRIPTION
1 2	SWITCH – 2 POSITION SELECTOR
H O A	SWITCH – 3 POSITION SELECTOR HAND/OFF/AUTO
	SWITCH – TEMPERATURE ACTUATED, NO
	THERMAL OVERLOAD, SINGLE PHASE
OLs	THERMAL OVERLOAD CONTACTS – 3 PHASE
	TRANSFORMER
	WIRE TERMINATION AT DEVICE
	WIRE TO WIRE TERMINATION

ABBREVIATIONS

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

NOTES:

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

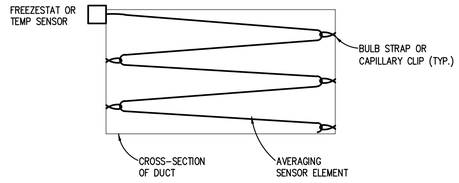


BUILDING AUTOMATION SYSTEM ARCHITECTURE

NO SCALE

NOTES:

1. BUILDING AUTOMATION SYSTEM FOR BUILDING IS TO BE ON THE TRIDIUM NIAGARA 4 (N4) PLATFORM.
2. REFER TO TEMPERATURE CONTROL SCHEMATICS FOR THE REQUIRED POINTS ASSOCIATED FOR EACH NEW HVAC SYSTEM PER MECHANICAL DRAWINGS.
3. TC CONTRACTOR SHALL DETERMINE DDC CONTROLLER QUANTITY AND AUXILIARY PANEL REQUIREMENTS BASED ON POINT DENSITIES AND LOCATIONS PER AVAILABLE MOUNTING SPACE. UNLESS SPECIFICALLY NOTED ON DESIGN DRAWINGS, TC CONTRACTOR SHALL LOCATE TEMPERATURE CONTROL PANELS WITH CONTROLLERS AND AUX COMPONENTS AS REQUIRED. COORDINATE WITH OTHER TRADES.
4. TC CONTRACTOR SHALL PROVIDE REQUIRED POWER SUPPLIES AS INDICATED IN TC GENERAL NOTES.
5. TC CONTRACTOR SHALL PROVIDE 24V TRANSFORMERS REQUIRED FOR TC CONTRACTOR PROVIDED CONTROLLERS AS REQUIRED. TRANSFORMERS SHALL BE LOCATED WITHIN EQUIPMENT ENCLOSURES OR OTHER TC PROVIDED ENCLOSURES TO BE LOCATED IN MECHANICAL OR ELECTRICAL ROOMS – COORDINATE LOCATIONS. MAXIMUM TRANSFORMER SIZE SHALL BE 100VA.
6. TC CONTRACTOR SHALL PROVIDE AUXILIARY PANEL FOR GAUGES, TRANSMITTERS, RELAYS, POWER TRANSFORMERS, ETC.
7. DDC CONTROLLERS FOR PACKAGED CONTROL EQUIPMENT SHALL INCLUDE BACnet MS/TP INTERFACE CARDS FOR THIS PROJECT. TC CONTRACTOR TO PROVIDE BACnet NETWORK WIRING TO PACKAGED CONTROLLERS.
8. 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.

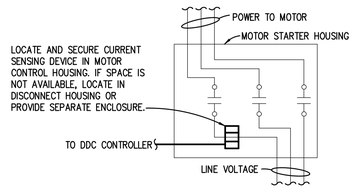


AVERAGING ELEMENT INSTALLATION DETAIL

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.

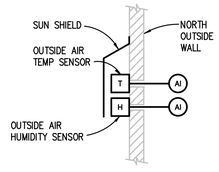


CURRENT SWITCH INSTALLATION DETAIL

TYPICAL

NOTES:

1. WHERE INDICATED ON CONTROL DETAILS, CURRENT SWITCHES SHALL BE INSTALLED FOR DDC SYSTEM STATUS INDICATION OF FAN OR PUMP OPERATION. APPROPRIATE TIME DELAY FOR STATUS FEEDBACK UPON DDC START AND STOP COMMANDS SHALL BE INCLUDED WITH THE DDC LOGIC TO AVOID NUISANCE OPERATIONAL ALARMS.
2. AS APPLICABLE, CURRENT SWITCH SHALL BE ADJUSTED TO MEET THE CURRENT DRAW REQUIRED TO DETECT FAN BELT LOSS, PUMP COUPLING DETACHMENT, OR VFC LOSS.
3. WHEN FAN OR PUMP IS ON AND NOT IN ALARM, DDC SYSTEM SHALL TOTALIZE RUN TIME HOURS FOR OPERATOR INFORMATION FROM BUILDING AUTOMATION SYSTEM OPERATOR INTERFACE.

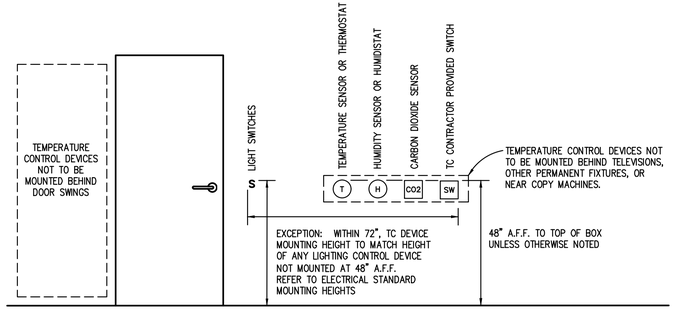


OA SENSOR INSTALLATION DETAIL

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.



TC DEVICE STANDARD MOUNTING HEIGHTS DETAIL

NO SCALE

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. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES. PROVIDE WALL MOUNTED DEVICE GUARDS WHERE INDICATED ON TC DETAILS OR AT SPECIFIC LOCATIONS INDICATED ON MECHANICAL FLOOR PLANS.
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.

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SHEET NAME

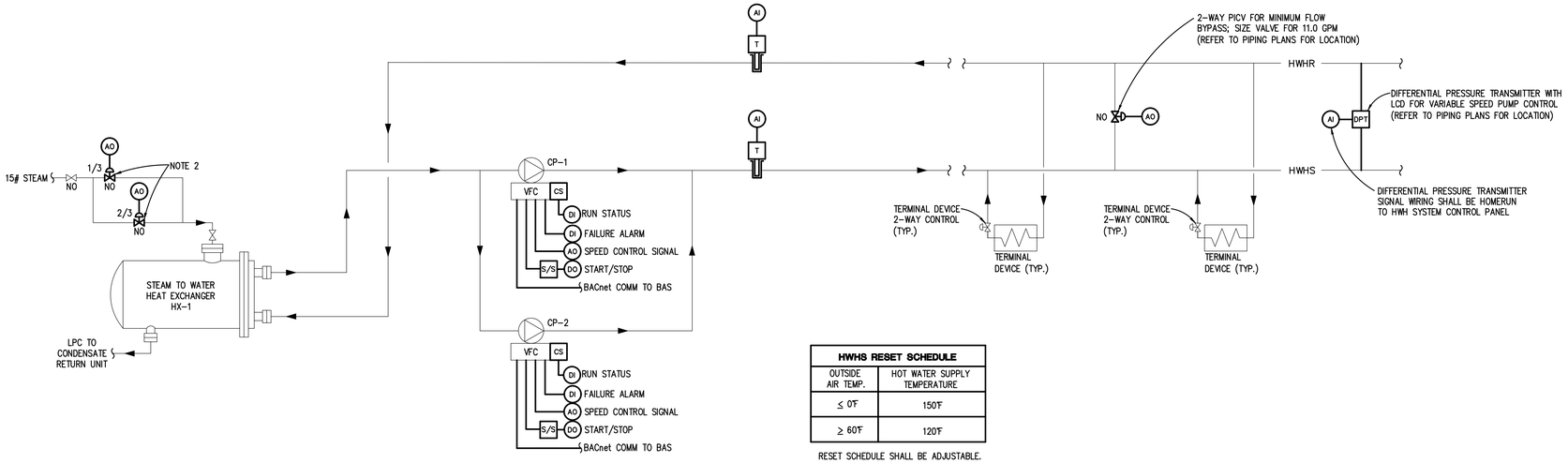
TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES

SHEET NO.

M8-01

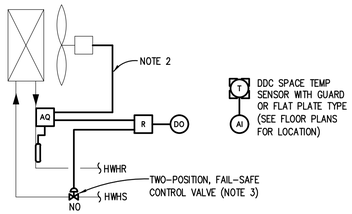
TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M8-01 APPLY TO THIS DRAWING



HWHS RESET SCHEDULE	
OUTSIDE AIR TEMP.	HOT WATER SUPPLY TEMPERATURE
≤ 0°F	150°F
≥ 60°F	120°F

RESET SCHEDULE SHALL BE ADJUSTABLE.



HWH UNIT HEATER CONTROL

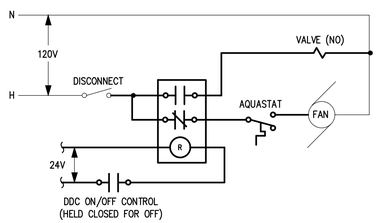
TYPICAL

NOTES:

1. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. AQUASTAT SHALL BE WIRED IN SERIES WITH FAN CONTROL WIRING CIRCUIT.
3. TC CONTRACTOR SHALL FURNISH 2-WAY PRESSURE DEPENDENT CONTROL VALVES FOR HEATING ELEMENTS PER MECHANICAL SCHEDULES FOR INSTALLATION BY MECH CONTRACTOR.

SEQUENCE OF OPERATION:

1. DDC SHALL ENABLE/DISABLE UH FAN CIRCUIT AND OPEN/CLOSE HEATING VALVE AS REQUIRED TO MAINTAIN SPACE TEMP SETPOINT OF 60°F (ADJ.).
2. FAN SHALL ACTIVATE UPON PROOF OF HWH FLOW BY AQ.
3. DDC SHALL PROVIDE 2°F DEADBAND AROUND SETPOINTS FOR CONTROL.



HWH UNIT HEATER WIRING

TYPICAL

HOT WATER HEATING SYSTEM CONTROL

SERVES EARLY CHILDHOOD AREA

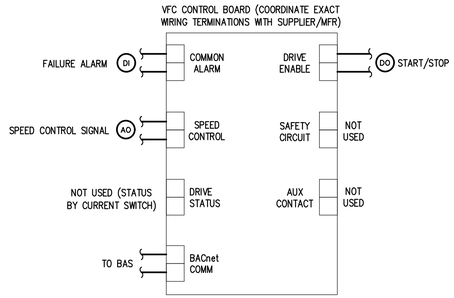
NOTES:

1. TC CONTRACTOR SHALL COORDINATE IMMERSION WELL FOR TEMP SENSORS WITH MECHANICAL CONTRACTOR.
2. TC CONTRACTOR SHALL FURNISH 1/3 & 2/3 STEAM CONTROL VALVE/ACTUATOR ASSEMBLY FOR HEAT EXCHANGER PER MECHANICAL SCHEDULES FOR INSTALLATION BY MECHANICAL CONTRACTOR.

SEQUENCE OF OPERATION:

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

1. HOT WATER HEATING SYSTEM SHALL BE ENABLED BY DDC TO OPERATE CONTINUOUSLY UPON A CALL FOR HEATING DEMAND FROM ONE OR MORE TERMINAL UNITS CONNECTED TO THE HWH SYSTEM LOOP DURING BUILDING OCCUPANCY OR WHEN OUTDOOR AIR TEMPERATURE IS BELOW 55°F DURING BUILDING UNOCCUPANCY.
2. HWH CIRC PUMPS CP-1 & CP-2 SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. WHEN HWH SYSTEM IS ENABLED, ONE OF THE TWO PUMPS SHALL BE ACTIVATED BY DDC TO OPERATE CONTINUOUSLY. THE OTHER WILL SERVE AS STANDBY.
3. DDC SHALL ALTERNATE PUMP OPERATION BASED ON RUNTIME HOURS OR AT THE BEGINNING OF EACH MONTH – OPERATOR SELECTABLE. THE STANDBY PUMP SHALL BE ACTIVATED PRIOR TO DEACTIVATING PREVIOUSLY DESIGNATED LEAD PUMP TO MAINTAIN FLOW THROUGH HX DURING SWITCHOVER.
4. DDC SHALL MONITOR OPERATING STATUS OF EACH PUMP THRU RESPECTIVE CURRENT SWITCH. UPON PUMP FAILURE, DDC SHALL ACTIVATE FAILURE ALARM AND AUTOMATICALLY START THE STANDBY PUMP.
5. VFD COMMON FAILURE ALARM FOR EACH CIRC PUMP SHALL BE MONITORED BY DDC THRU AVAILABLE CONTACTS AT RESPECTIVE PUMP.
6. DDC SHALL MONITOR HWH SYSTEM LOOP DIFFERENTIAL PRESSURE TRANSMITTER AND MODULATE HWH CIRC PUMP VFC TO MAINTAIN HWH LOOP DIFFERENTIAL PRESSURE SETPOINT OF 20 FT OF HEAD (FINAL SETPOINT TO BE ADJUSTED AT SYSTEM BALANCING).
7. WHENEVER HWH CIRC PUMP VFC SPEED IS OPERATING AT HWH FLOW LOW LIMIT SETPOINT (0% CONTROL SIGNAL FROM DDC) AND HWH LOOP DIFFERENTIAL PRESSURE IS ABOVE SETPOINT, DDC SHALL MODULATE MINIMUM FLOW BYPASS VALVE OPEN TO MAINTAIN HWH LOOP DP SETPOINT. WHENEVER MINIMUM FLOW BYPASS VALVE MODULATES TO FULL CLOSED POSITION, AFTER 600 SECONDS, DDC SHALL MODULATE HWH CIRC PUMP VFC TO MAINTAIN HWH LOOP DPT SETPOINT AS PREVIOUSLY DESCRIBE.
8. DDC SHALL MODULATE HX 1/3 & 2/3 CONTROL VALVES IN SEQUENCE TO MAINTAIN HOT WATER HEATING HEATING SUPPLY (HWHS) TEMP BASED ON INDICATED OUTSIDE AIR RESET SCHEDULE.



HWH PUMPS CP-1 & CP-2 VFC WIRING

TYPICAL

NOTES:

1. VFC WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS. TC CONTRACTOR AND VFC START-UP REP SHALL JOINTLY FIELD COORDINATE VFC CONTROL AND OPERATION TO MEET SEQUENCE OF OPERATION.
2. VFC SHALL BE WIRED TO BAS THRU BACnet INTERFACE FOR ADDITIONAL MONITORING. REFER TO DETAIL ON DRAWING M8-01.

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KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

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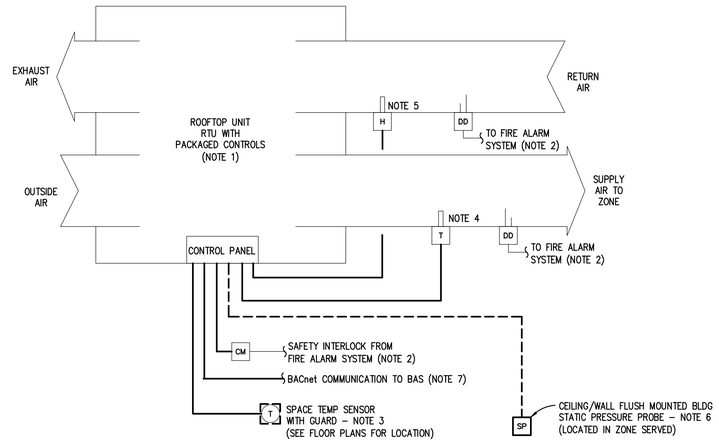
SHEET NAME

TEMPERATURE CONTROLS

SHEET NO.

M8-02



PACKAGED RTU-1 FIELD INSTALLATION & CONTROL

RTU–1 SERVES CLASSROOMS

NOTES:

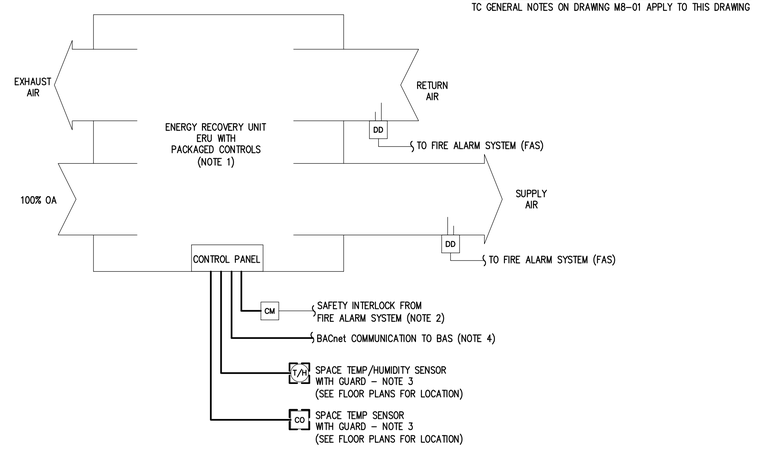
1. SINGLE ZONE VAV ROOF TOP UNIT SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS INCLUDING CONTROL DAMPERS AND BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, OCCUPIED AND UNOCCUPIED SPACE TEMP SETPOINT ADJUSTMENT AND UNIT MONITORING. SINGLE POINT POWER SUPPLY CONNECTION SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR. TC CONTRACTOR SHALL PROVIDE CONTROL FIELD WIRING AND INSTRUMENTATION TUBING FOR UNIT PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARD FOR SPACE SENSOR.
2. 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 RTU SAFETY CUTOUT CIRCUIT.
3. REMOTE SPACE TEMP SENSOR FURNISHED BY UNIT SUPPLIER SHALL BE INSTALLED AND WIRED BY TC CONTRACTOR.
4. DISCHARGE AIR TEMP SENSOR FURNISHED BY UNIT SUPPLIER SHALL BE INSTALLED AND WIRED BY TC CONTRACTOR.
5. RETURN AIR HUMIDITY SENSOR FURNISHED BY UNIT SUPPLIER SHALL BE INSTALLED AND WIRED BY TC CONTRACTOR.
6. TC CONTRACTOR SHALL PROVIDE SPACE STATIC PRESSURE PROBE AND INSTRUMENTATION TUBING TO RTU PACKAGED CONTROLS.
7. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM ROOF TOP UNIT CONTROL PANEL TO NEW BAS NETWORK SUPERVISORY CONTROLLER, COMMUNICATING BUT NOT LIMITED TO THE FOLLOWING POINTS AS AVAILABLE:
   - OCCUPANCY MODE SCHEDULER (FROM BAS)
   - EFFECTIVE OCCUPANCY MODE (TO BAS)
   - SUPPLY FAN COMMAND STATUS (TO BAS)
   - SUPPLY FAN RUN STATUS (TO BAS)
   - SUPPLY FAN SPEED COMMAND STATUS (TO BAS)
   - RELIEF (EXHAUST) FAN COMMAND STATUS (TO BAS)
   - RELIEF (EXHAUST) FAN RUN STATUS (TO BAS)
   - RELIEF (EXHAUST) FAN SPEED COMMAND 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)
   - EFFECTIVE SPACE TEMP SETPOINT (TO BAS)
   - SPACE STATIC PRESSURE SETPOINT (FROM BAS)
   - SPACE STATIC PRESSURE (TO BAS)
   - DISCHARGE AIR TEMP (TO BAS)
   - HEATING/COOLING MODE STATUS (TO BAS)
   - HEATING OUTPUT STATUS (TO BAS)
   - COOLING OUTPUT STATUS (TO BAS)
   - RETURN AIR CO2 (TO BAS)
   - RETURN AIR CO2 SETPOINT (FROM BAS)
   - DAMPER OUTPUT STATUS (TO BAS)
   - DAMPER ECONOMIZER ENABLE STATUS (TO BAS)
   - COMPRESSOR ENABLE (MODULATING) STATUS (TO BAS)
   - DEHUMIDIFICATION MODE STATUS (TO BAS)
   - DIRTY FILTER STATUS (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)
9. TC CONTRACTOR SHALL OBTAIN EQUIPMENT SHOP DRAWINGS FROM SELECTED RTU SUPPLIER TO DEVELOP GRAPHICS THAT REPRESENT ACTUAL UNIT CONFIGURATION WITH COMPONENTS SHOWN IN CORRECT LOCATIONS.
10. TC CONTRACTOR SHALL INCLUDE A MINIMUM OF 4 HOURS PER UNIT WITH BID (OR MORE AS DETERMINED BY TC CONTRACTOR THAT SHOULD BE DOCUMENTED IN THEIR SCOPE OF WORK SUMMARY) TO REVIEW UNIT SUBMITTAL TO DETERMINE FIELD INSTALLED COMPONENTS AND WIRING REQUIREMENTS AND INTEGRATION DATA AVAILABLE FROM UNIT'S PACKAGED CONTROLS FOR DEVELOPMENT OF SYSTEM GRAPHICS TO INCLUDE RELEVANT INFORMATION FOR OWNER'S CONTROL AND MONITORING OF UNIT. LABOR HOURS SHALL ALSO ACCOMMODATE TIME SPENT WITH UNIT MANUFACTURER'S TECHNICIAN TO COORDINATE ALL PACKAGED CONTROLLER POINTS TO BE INTEGRATED TO THE BAS. TC CONTRACTOR SHALL LOG ALL TIME SPENT ON EACH UNIT RELATIVE TO THIS SCOPE OF WORK TO ENSURE FAIR COMPENSATION FOR TC CONTRACTOR INVOLVEMENT TO PROPERLY CONTROL MODES OF UNIT OPERATION, SET UP DESIRED SETPOINT ADJUSTMENTS AND DIAGNOSTIC MONITOR OF UNIT.

SEQUENCE OF OPERATION:

1. FOR OCCUPIED MODE, RTU WITH PACKAGED CONTROLS SHALL MAINTAIN A HEATING MODE SPACE TEMP SETPOINT OF 70°F OR COOLING MODE SPACE TEMP SETPOINT OF 74°F (BOTH SETPOINTS ADJ. THRU BAS) WHILE SUPPLY FAN OPERATES CONTINUOUSLY. SUPPLY FAN SPEED SHALL BE MODULATED BY PACKAGED CONTROLS IN SEQUENCE TO HEATING/COOLING CONTROL. PACKAGED CONTROL SHALL MODULATE MIXING DAMPERS, STAGE DX AND MODULATE GAS HEAT AS REQUIRED TO MAINTAIN SPACE TEMP CONTROL. PACKAGED CONTROL SHALL PROVIDE MINIMUM OUTSIDE AIR DAMPER CONTROL AS SUPPLY AIRFLOW VARIES. DAMPER CONTROL SHALL INCLUDE COMPARATIVE ENTHALPY ECONOMIZER CONTROL TO MODULATE DAMPERS ABOVE MINIMUM OA SETTING TO PROVIDE FREE COOLING WHEN AVAILABLE.
2. FOR UNOCCUPIED MODE, RTU WITH PACKAGED CONTROLS SHALL CYCLE SUPPLY FAN WITH SPEED MODULATION AS REQUIRED TO MAINTAIN UNOCCUPIED HEATING MODE SPACE TEMP HEATING SETPOINT OF 62°F OR COOLING MODE SPACE TEMP SETPOINT OF 82°F. OA DAMPER SHALL REMAIN CLOSED AND RELIEF (EXHAUST) FAN SHALL REMAIN OFF.
4. RELIEF (EXHAUST) FAN VFC SHALL BE MODULATED BY PACKAGED CONTROLS TO MAINTAIN REMOTE SPACE STATIC PRESSURE SETPOINT OF +0.01" W.C. THAT IS ADJUSTABLE FROM BAS THRU BACnet COMMUNICATION.
5. RTU PACKAGED CONTROLS SHALL INCLUDE DEHUMIDIFICATION MODE WHEN RETURN AIR HUMIDITY REACHES HIGH LIMIT SETPOINT.
6. 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, SPACE TEMP, HUMIDITY AND SPACE STATIC PRESSURE SETPOINT ADJUSTMENTS AND ADDITIONAL UNIT MONITORING AS AVAILABLE.
7. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE UNIT THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.

TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M8–01 APPLY TO THIS DRAWING



PACKAGED ERU-1 & 2 FIELD INSTALLATION & CONTROL

ERU–1 SERVES GYMNASIUM
ERU–2 SERVES CAFE

NOTES:

1. SINGLE ZONE VAV ENERGY RECOVERY UNIT WITH INDIRECT GAS HX, PACKAGED DX COOLING AND ENERGY WHEEL SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS INCLUDING ALL CONTROL DAMPERS AND BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, MORNING WARM–UP, ECONOMIZER, OCCUPIED AND UNOCCUPIED SPACE TEMP SETPOINT ADJUSTMENT AND UNIT MONITORING. SINGLE POINT POWER SUPPLY CONNECTION SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR. TC CONTRACTOR SHALL PROVIDE CONTROL FIELD WIRING FOR UNIT PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN.
2. 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 ERU SAFETY CUTOUT CIRCUIT.
3. TC CONTRACTOR SHALL INSTALL SPACE TEMP/HUMIDITY AND SPACE CO2 SENSOR AS FURNISHED BY UNIT SUPPLIER AND PROVIDE WIRING TO THE UNIT PACKAGED CONTROLS. TC CONTRACTOR SHALL PROVIDE GUARDS FOR SENSORS.
4. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM ERU CONTROL PANEL TO BAS NETWORK SUPERVISORY CONTROLLER, COMMUNICATING BUT NOT LIMITED TO THE FOLLOWING POINTS AS AVAILABLE:
   - OCCUPANCY MODE SCHEDULER (FROM BAS)
   - EFFECTIVE OCCUPANCY MODE (TO BAS)
   - SUPPLY FAN COMMAND STATUS (TO BAS)
   - SUPPLY FAN RUN STATUS (TO BAS)
   - SUPPLY FAN SPEED COMMAND STATUS (TO BAS)
   - EXHAUST FAN COMMAND STATUS (TO BAS)
   - EXHAUST FAN RUN STATUS (TO BAS)
   - EXHAUST FAN SPEED COMMAND STATUS (TO BAS)
   - ENERGY WHEEL COMMAND STATUS (TO BAS)
   - ENERGY WHEEL RUN STATUS (TO BAS)
   - ENERGY WHEEL SPEED COMMAND 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)
   - EFFECTIVE SPACE TEMP SETPOINT (TO BAS)
   - DISCHARGE AIR TEMP (TO BAS)
   - HEATING/COOLING MODE STATUS (TO BAS)
   - HEATING OUTPUT STATUS (TO BAS)
   - COOLING OUTPUT STATUS (TO BAS)
   - OA DAMPER MINIMUM CFM SETPOINT (FROM BAS)
   - DAMPER OUTPUT STATUS (TO BAS)
   - DAMPER ECONOMIZER ENABLE STATUS (TO BAS)
   - COMPRESSOR ENABLE STATUS, EACH STAGE (TO BAS)
   - DIRTY FILTER STATUS (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)
5. TC CONTRACTOR SHALL OBTAIN EQUIPMENT SHOP DRAWINGS FROM SELECTED ERU SUPPLIER TO DEVELOP GRAPHICS THAT REPRESENT ACTUAL UNIT CONFIGURATION WITH COMPONENTS SHOWN IN CORRECT LOCATIONS.
6. TC CONTRACTOR SHALL INCLUDE A MINIMUM OF 4 HOURS PER UNIT WITH BID (OR MORE AS DETERMINED BY TC CONTRACTOR THAT SHOULD BE DOCUMENTED IN THEIR SCOPE OF WORK SUMMARY) TO REVIEW UNIT SUBMITTAL TO DETERMINE FIELD INSTALLED COMPONENTS AND WIRING REQUIREMENTS AND INTEGRATION DATA AVAILABLE FROM UNIT'S PACKAGED CONTROLS FOR DEVELOPMENT OF SYSTEM GRAPHICS TO INCLUDE RELEVANT INFORMATION FOR OWNER'S CONTROL AND MONITORING OF UNIT. LABOR HOURS SHALL ALSO ACCOMMODATE TIME SPENT WITH UNIT MANUFACTURER'S TECHNICIAN TO COORDINATE ALL PACKAGED CONTROLLER POINTS TO BE INTEGRATED TO THE BAS. TC CONTRACTOR SHALL LOG ALL TIME SPENT ON EACH UNIT RELATIVE TO THIS SCOPE OF WORK TO ENSURE FAIR COMPENSATION FOR TC CONTRACTOR INVOLVEMENT TO PROPERLY CONTROL MODES OF UNIT OPERATION, SET UP DESIRED SETPOINT ADJUSTMENTS AND DIAGNOSTIC MONITOR OF UNIT.

SEQUENCE OF OPERATION:

1. FOR OCCUPIED MODE, ERU WITH PACKAGED CONTROLS SHALL MAINTAIN EFFECTIVE SPACE TEMP SETPOINT OF 70°F (SETPOINT ADJ. THRU BAS). PACKAGED CONTROL SHALL MODULATE SUPPLY FAN VFC, OA/RA DAMPERS, ENERGY WHEEL SPEED, INDIRECT GAS HEAT AND CYCLE DX COOLING AS REQUIRED TO MAINTAIN SPACE TEMP CONTROL.
2. FOR UNOCCUPIED MODE, ERU WITH PACKAGED CONTROLS SHALL CYCLE SUPPLY FAN AS REQUIRED TO MAINTAIN UNOCCUPIED MODE SPACE TEMP SETPOINT OF 62°F. ERU SHALL OPERATE ON RECIRCULATION MODE. ERU EXHAUST FAN SHALL REMAIN OFF.
3. ERU PACKAGED CONTROLS SHALL MODULATE EXHAUST FAN VFC TO MAINTAIN AIRFLOW OFFSET FROM SUPPLY AIRFLOW THAT PROVIDES SLIGHT NEGATIVE PRESSURE BETWEEN THE AREA SERVED AND ADJACENT CORRIDOR (TAB CONTRACTOR SHALL DETERMINE FINAL OFFSET AIRFLOW BALANCE SETTINGS DURING SYSTEM BALANCING).
4. ERU PACKAGED CONTROLS SHALL ACTIVATE DEMAND CONTROL VENTILATION MODE WHEN SPACE CO2 LEVEL REACHES HIGH LIMIT SETPOINT. OA DAMPER SHALL MODULATE ABOVE MIN–MIN OA DAMPER POSITION TO MAINTAIN SPACE CO2 LEVEL HIGH LIMIT SETPOINT OF 800 PPM. OA DAMPER MODULATION SHALL BE LIMITED BY MAX–MIN OA DAMPER POSITION SETPOINT. DEPENDING ON PACKAGED CONTROLS CAPABILITY, THE DCV FUNCTION MAY NEED TO BE ACCOMPLISHED BY BAS TO RESET MIN–MIN OA DAMPER POSITION BASED ON SPACE CO2 READING BY BAS THRU BACNET INTEGRATION.
6. ERU PACKAGED CONTROLS SHALL ACTIVATE ENERGY WHEEL DEFROST CYCLE WHEN OUTSIDE AIR TEMPERATURE IS BELOW 5°F AND THE DIFFERENTIAL PRESSURE ACROSS THE WHEEL IS 1.5" W.C. (ADJ.).
7. ERU PACKAGED CONTROLS SHALL INCLUDE DEHUMIDIFICATION MODE WHEN SPACE HUMIDITY REACHES HIGH LIMIT SETPOINT. DURING DEHUMIDIFICATION MODE, DISCHARGE AIR TEMPERATURE SHALL BE MAINTAINED BY MODULATION OF HOT GAS REHEAT BY PACKAGED CONTROLS.
8. 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, SPACE TEMP ADJUSTMENTS AND ADDITIONAL UNIT MONITORING AS AVAILABLE.
9. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE UNIT THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.

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PBA Project No. 2022.0015

OWNER

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JPG

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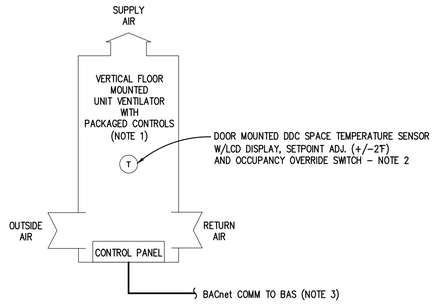
SVM

SHEET NAME
TEMPERATURE CONTROLS

SHEET NO.
M8-03



PACKAGED VERTICAL FLOOR MOUNTED UNIT VENTILATOR FIELD INSTALLATION & CONTROL

TYPICAL - REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF UNITS

NOTES:

1. SINGLE ZONE VERTICAL UNIT VENTILATOR SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS INCLUDING CONTROL DAMPERS, HWH HEATING COIL CONTROL VALVE AND DX COOLING. BACnet COMMUNICATION INTERFACE SHALL BE PROVIDED WITH UNIT FOR BAS SCHEDULING, OCCUPIED AND UNOCCUPIED SPACE TEMP SETPOINT ADJUSTMENT AND UNIT MONITORING. SINGLE POINT POWER SUPPLY CONNECTION SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.

2. TC CONTRACTOR SHALL INSTALL SPACE TEMP SENSOR AS FURNISHED BY UNIT SUPPLIER. UNIT SUPPLIER SHALL PROVIDE SPACE TEMPERATURE SENSOR WIRING HARNESS AND MOUNTING HOLES/LOCATION FOR VUV.

3. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM UV CONTROL PANEL TO NEW BAS NETWORK SUPERVISORY CONTROLLER, COMMUNICATING BUT NOT LIMITED TO THE FOLLOWING POINTS AS AVAILABLE:

   - OCCUPANCY MODE SCHEDULER (FROM BAS)
   - EFFECTIVE OCCUPANCY MODE (TO BAS)
   - SUPPLY FAN COMMAND STATUS (TO BAS)
   - SUPPLY FAN RUN STATUS (TO BAS)
   - EXHAUST/CONDENSER FAN COMMAND STATUS (TO BAS)
   - EXHAUST/CONDENSER 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)
   - LOCAL SPACE TEMP ADJUSTMENT VALUE (TO BAS)
   - EFFECTIVE SPACE TEMP SETPOINT (TO BAS)
   - LOCAL OCCUPANCY OVERRIDE ACTIVATION STATUS (TO BAS)
   - DISCHARGE AIR TEMP (TO BAS)
   - SPACE TEMPERATURE (TO BAS)
   - RETURN AIR TEMPERATURE (TO BAS)
   - HEATING/COOLING MODE STATUS (TO BAS)
   - HEATING OUTPUT (MODULATING) STATUS (TO BAS)
   - DAMPER OUTPUT (POSITION) STATUS (TO BAS)
   - DAMPER ECONOMIZER ENABLE STATUS (TO BAS)
   - DX COOLING STATUS/STAGE(S) ACTIVE (TO BAS)
   - FREEZESTAT STATUS (TO BAS)
   - DIRTY FILTER STATUS (TO BAS)
   - OTHER AVAILABLE TEMPERATURE MONITORING (TO BAS)
   - SENSOR FAILURE ALARMS (TO BAS)
   - OTHER SAFETY CUTOUT ALARMS (TO BAS)
   - OTHER MISC ALARMS (TO BAS)

5. TC CONTRACTOR SHALL OBTAIN EQUIPMENT SHOP DRAWINGS FROM SELECTED UV SUPPLIER TO DEVELOP GRAPHICS THAT REPRESENT ACTUAL UNIT CONFIGURATION WITH COMPONENTS SHOWN IN CORRECT LOCATIONS.

6. TC CONTRACTOR SHALL INCLUDE A MINIMUM OF 1/2 HOUR PER UNIT WITH BID (OR MORE AS DETERMINED BY TC CONTRACTOR THAT SHOULD BE DOCUMENTED IN THEIR SCOPE OF WORK SUMMARY) TO REVIEW UNIT SUBMITTAL TO DETERMINE FIELD INSTALLED COMPONENTS AND WIRING REQUIREMENTS AND INTEGRATION DATA AVAILABLE FROM UNIT'S PACKAGED CONTROLS FOR DEVELOPMENT OF SYSTEM GRAPHICS TO INCLUDE RELEVANT INFORMATION FOR OWNER'S CONTROL AND MONITORING OF UNIT. LABOR HOURS SHALL ALSO ACCOMMODATE TIME SPENT WITH UNIT MANUFACTURER'S TECHNICIAN TO COORDINATE ALL PACKAGED CONTROLLER POINTS TO BE INTEGRATED TO THE BAS. TC CONTRACTOR SHALL LOG ALL TIME SPENT ON EACH UNIT RELATIVE TO THIS SCOPE OF WORK TO ENSURE FAIR COMPENSATION FOR TC CONTRACTOR INVOLVEMENT TO PROPERLY CONTROL MODES OF UNIT OPERATION, SET UP DESIRED SETPOINT ADJUSTMENTS AND DIAGNOSTIC MONITOR OF UNIT.

SEQUENCE OF OPERATION:

1. FOR OCCUPIED MODE, UV WITH PACKAGED CONTROLS SHALL MAINTAIN A HEATING MODE SPACE TEMP SETPOINT OF 70°F OR COOLING MODE SPACE TEMP SETPOINT OF 74°F (BOTH SETPOINTS ADJ. THRU BAS) WHILE SUPPLY FAN OPERATES CONTINUOUSLY. SUPPLY FAN SPEED SHALL BE SET BY PACKAGED CONTROLS TO HEATING/COOLING CONTROL. PACKAGED CONTROL SHALL MODULATE ECONOMIZER DAMPERS, STAGE DX AND MODULATE HWH COIL CONTROL VALVE AS REQUIRED TO MAINTAIN SPACE TEMP CONTROL. DAMPER CONTROL SHALL INCLUDE DRY BULB ECONOMIZER CONTROL TO MODULATE DAMPERS ABOVE MINIMUM OA SETTING TO PROVIDE FREE COOLING WHEN AVAILABLE.

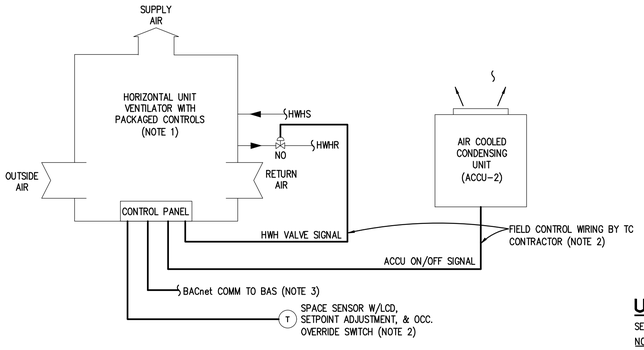
2. EXHAUST/CONDENSER FAN SPEED SHALL BE MODULATED BY PACKAGED CONTROLS RELATIVE TO DAMPER ECONOMIZER CONTROL OR CONDENSER HEAD PRESSURE CONTROL DURING DX COOLING MODE.

3. FOR UNOCCUPIED MODE, UV WITH PACKAGED CONTROLS SHALL CYCLE SUPPLY FAN ON & OFF WHILE MODULATING HWH HEATING OR STAGING DX COOLING AS REQUIRED TO MAINTAIN TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE HEATING MODE SETPOINT OF 62°F OR COOLING MODE SETPOINT OF 82°F. OA DAMPER SHALL REMAIN CLOSED.

4. WHEN ZONE IS UNOCCUPIED DURING SCHEDULED OCCUPIED MODE AS DETERMINED BY UV PACKAGED CONTROLS MONITORING OF LIGHTING OCCUPANCY SENSOR AUX CONTACTS. UV WITH PACKAGED CONTROLS SHALL OPERATE UV IN TEMPORARY UNOCCUPIED MODE AS FOLLOWS; UV SUPPLY FAN SHALL OPERATE CONTINUOUSLY, OCCUPIED SPACE TEMP SETPOINT SHALL BE MAINTAINED AND OA DAMPER SHALL CLOSE.

5. FREEZESTAT SHALL DEACTIVATE UNIT IF DA TEMP IS 35°F OR BELOW.

6. BACnet OPEN PROTOCOL COMMUNICATIONS INTERFACE SHALL BE PROVIDED WITH PACKAGED CONTROLS AND CONNECTED TO OWNER'S BUILDING AUTOMATION SYSTEM THAT SHALL ALLOW UNIT OCCUPIED MODE SCHEDULING, FAN STATUSES, SPACE TEMP SETPOINT ADJUSTMENTS, DIRTY FILTER MONITORING AND ADDITIONAL UNIT MONITORING AS AVAILABLE.



PACKAGED HORIZONTAL UNIT FLOOR MOUNTED UNIT VENTILATOR FIELD INSTALLATION & CONTROL

TYPICAL FOR VUV-10 ONLY SERVING CLASSROOM 105

NOTES:

1. SINGLE ZONE HORIZONTAL UNIT VENTILATOR SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS INCLUDING CONTROL DAMPERS, HWH HEATING COIL CONTROL VALVE AND DX COOLING WITH REMOTE AIR COOLED CONDENSING UNIT. BACnet COMMUNICATION INTERFACE SHALL BE PROVIDED WITH UNIT FOR BAS SCHEDULING, OCCUPIED AND UNOCCUPIED SPACE TEMP SETPOINT ADJUSTMENT AND UNIT MONITORING. SINGLE POINT POWER SUPPLY CONNECTION SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.

2. TC CONTRACTOR SHALL INSTALL SPACE TEMP SENSOR AS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED. COORDINATE ALL CONTROL WIRING WITH UNIT MFG. FIELD REP.

3. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM UV CONTROL PANEL TO NEW BAS NETWORK SUPERVISORY CONTROLLER, COMMUNICATING BUT NOT LIMITED TO THE FOLLOWING POINTS AS AVAILABLE:

   - OCCUPANCY MODE SCHEDULER (FROM BAS)
   - EFFECTIVE OCCUPANCY MODE (TO BAS)
   - SUPPLY FAN COMMAND STATUS (TO BAS)
   - SUPPLY 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)
   - LOCAL SPACE TEMP ADJUSTMENT VALUE (TO BAS)
   - EFFECTIVE SPACE TEMP SETPOINT (TO BAS)
   - LOCAL OCCUPANCY OVERRIDE ACTIVATION STATUS (TO BAS)
   - DISCHARGE AIR TEMP (TO BAS)
   - SPACE TEMPERATURE (TO BAS)
   - RETURN AIR TEMPERATURE (TO BAS)
   - HEATING/COOLING MODE STATUS (TO BAS)
   - HEATING OUTPUT (MODULATING) STATUS (TO BAS)
   - DAMPER OUTPUT (POSITION) STATUS (TO BAS)
   - DAMPER ECONOMIZER ENABLE STATUS (TO BAS)
   - DX COOLING STATUS/STAGE(S) ACTIVE (TO BAS)
   - FREEZESTAT STATUS (TO BAS)
   - DIRTY FILTER STATUS (TO BAS)
   - OTHER AVAILABLE TEMPERATURE MONITORING (TO BAS)
   - SENSOR FAILURE ALARMS (TO BAS)
   - OTHER SAFETY CUTOUT ALARMS (TO BAS)
   - OTHER MISC ALARMS (TO BAS)

5. TC CONTRACTOR SHALL OBTAIN EQUIPMENT SHOP DRAWINGS FROM SELECTED UV SUPPLIER TO DEVELOP GRAPHICS THAT REPRESENT ACTUAL UNIT CONFIGURATION WITH COMPONENTS SHOWN IN CORRECT LOCATIONS.

6. TC CONTRACTOR SHALL INCLUDE A MINIMUM OF 1/2 HOUR PER UNIT WITH BID (OR MORE AS DETERMINED BY TC CONTRACTOR THAT SHOULD BE DOCUMENTED IN THEIR SCOPE OF WORK SUMMARY) TO REVIEW UNIT SUBMITTAL TO DETERMINE FIELD INSTALLED COMPONENTS AND WIRING REQUIREMENTS AND INTEGRATION DATA AVAILABLE FROM UNIT'S PACKAGED CONTROLS FOR DEVELOPMENT OF SYSTEM GRAPHICS TO INCLUDE RELEVANT INFORMATION FOR OWNER'S CONTROL AND MONITORING OF UNIT. LABOR HOURS SHALL ALSO ACCOMMODATE TIME SPENT WITH UNIT MANUFACTURER'S TECHNICIAN TO COORDINATE ALL PACKAGED CONTROLLER POINTS TO BE INTEGRATED TO THE BAS. TC CONTRACTOR SHALL LOG ALL TIME SPENT ON EACH UNIT RELATIVE TO THIS SCOPE OF WORK TO ENSURE FAIR COMPENSATION FOR TC CONTRACTOR INVOLVEMENT TO PROPERLY CONTROL MODES OF UNIT OPERATION, SET UP DESIRED SETPOINT ADJUSTMENTS AND DIAGNOSTIC MONITOR OF UNIT.

SEQUENCE OF OPERATION:

1. FOR OCCUPIED MODE, UV WITH PACKAGED CONTROLS SHALL MAINTAIN A HEATING MODE SPACE TEMP SETPOINT OF 70°F OR COOLING MODE SPACE TEMP SETPOINT OF 74°F (BOTH SETPOINTS ADJ. THRU BAS) WHILE SUPPLY FAN OPERATES CONTINUOUSLY. SUPPLY FAN SPEED SHALL BE SET BY PACKAGED CONTROLS TO HEATING/COOLING CONTROL. PACKAGED CONTROL SHALL MODULATE ECONOMIZER DAMPERS, STAGE DX AND MODULATE HWH COIL CONTROL VALVE AS REQUIRED TO MAINTAIN SPACE TEMP CONTROL. DAMPER CONTROL SHALL INCLUDE DRY BULB ECONOMIZER CONTROL TO MODULATE DAMPERS ABOVE MINIMUM OA SETTING TO PROVIDE FREE COOLING WHEN AVAILABLE.

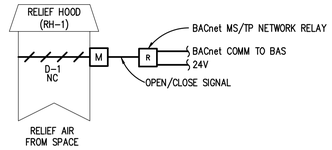
2. EXHAUST/CONDENSER FAN SPEED SHALL BE MODULATED BY PACKAGED CONTROLS RELATIVE TO DAMPER ECONOMIZER CONTROL OR CONDENSER HEAD PRESSURE CONTROL DURING DX COOLING MODE.

3. FOR UNOCCUPIED MODE, UV WITH PACKAGED CONTROLS SHALL CYCLE SUPPLY FAN ON & OFF WHILE MODULATING HWH HEATING OR STAGING DX COOLING AS REQUIRED TO MAINTAIN TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE HEATING MODE SETPOINT OF 62°F OR COOLING MODE SETPOINT OF 82°F. OA DAMPER SHALL REMAIN CLOSED.

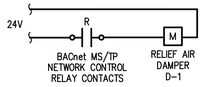
4. WHEN ZONE IS UNOCCUPIED DURING SCHEDULED OCCUPIED MODE AS DETERMINED BY UV PACKAGED CONTROLS MONITORING OF LIGHTING OCCUPANCY SENSOR AUX CONTACTS. UV WITH PACKAGED CONTROLS SHALL OPERATE UV IN TEMPORARY UNOCCUPIED MODE AS FOLLOWS; UV SUPPLY FAN SHALL OPERATE CONTINUOUSLY, OCCUPIED SPACE TEMP SETPOINT SHALL BE MAINTAINED AND OA DAMPER SHALL CLOSE.

5. FREEZESTAT SHALL DEACTIVATE UNIT IF DA TEMP IS 35°F OR BELOW.

6. BACnet OPEN PROTOCOL COMMUNICATIONS INTERFACE SHALL BE PROVIDED WITH PACKAGED CONTROLS AND CONNECTED TO OWNER'S BUILDING AUTOMATION SYSTEM THAT SHALL ALLOW UNIT OCCUPIED MODE SCHEDULING, FAN STATUSES, SPACE TEMP SETPOINT ADJUSTMENTS, DIRTY FILTER MONITORING AND ADDITIONAL UNIT MONITORING AS AVAILABLE.



CONTROL DETAIL



WIRING DETAIL

UV-10 REMOTE RELIEF AIR DAMPER

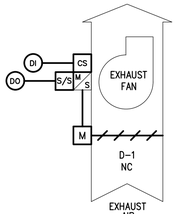
SERVES CLASSROOM 105

NOTES:

1. REFER TO FLOOR PLANS FOR LOCATION OF UNITS.
2. TC CONTRACTOR SHALL FURNISH CONTROL DAMPER FOR INSTALLATION BY SHEET METAL CONTRACTOR.
3. TC CONTRACTOR SHALL PROVIDE BACnet NETWORK RELAY AND ALL ASSOCIATED CONTROL WIRING.

SEQUENCE OF OPERATION:

1. RELIEF AIR DAMPER SHALL SHALL BE OPENED BY BAS WHEN UV-10 IS OPERATING IN OCCUPIED MODE. RELIEF AIR DAMPER SHALL REMAIN CLOSED WHEN UV-10 IS OPERATING IN MORNING WARM UP OR UNOCCUPIED CYCLE MODE.



EF-1 & EF-2 CONTROL

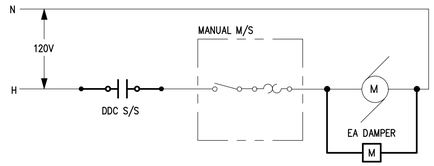
TYPICAL FOR:
EF-1 SERVES BOYS TOILET ROOM 009 & GIRLS TOILET ROOM 010
EF-2 SERVES TOILET ROOM 003

NOTES:

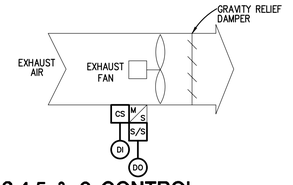
1. REFER TO FLOOR PLANS FOR LOCATION OF UNIT.
2. TC CONTRACTOR SHALL FURNISH CONTROL DAMPERS. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR.

SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL BE STARTED AND STOPPED BY DDC BASED ON BUILDING OCCUPIED MODE SCHEDULE. WIRING INTERLOCK SHALL OPEN DAMPER.
2. DDC SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. ABNORMAL EF OPERATION SHALL ACTIVATE REMOTE ALARM. DDC SHALL TOTALIZE FAN RUN TIME HOURS OF OPERATION.



EF-1 & 2 M/S WIRING



EF-3,4,5 & 6 CONTROL

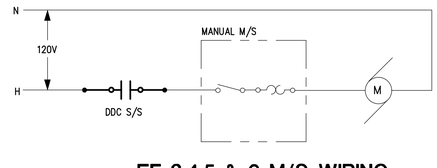
TYPICAL FOR:
EF-3 SERVES BOYS TOILET ROOM 117
EF-4 SERVES GIRLS TOILET ROOM 116
EF-5 SERVES BOYS TOILET ROOM 209
EF-6 SERVES GIRLS TOILET ROOM 208

NOTES:

1. REFER TO FLOOR PLANS FOR LOCATION OF UNIT.

SEQUENCE OF OPERATION:

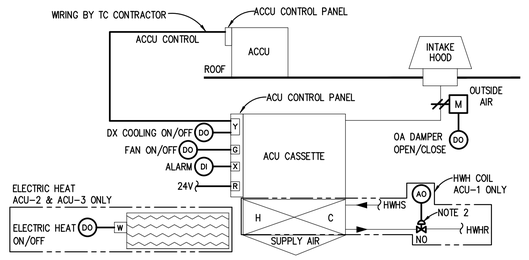
1. EXHAUST FAN SHALL BE STARTED AND STOPPED BY DDC BASED ON BUILDING OCCUPIED MODE SCHEDULE.
2. DDC SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. ABNORMAL EF OPERATION SHALL ACTIVATE REMOTE ALARM. DDC SHALL TOTALIZE FAN RUN TIME HOURS OF OPERATION.



EF-3,4,5 & 6 M/S WIRING

TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M8-01 APPLY TO THIS DRAWING



ACU/ACCU CASSETTE UNIT CONTROL

TYPICAL, EXCEPT WHERE NOTED
ACU-1/ACCU-1 SERVES LIBRARY
ACU-3/ACCU-3 SERVES OFFICE 123
ACU-4/ACCU-4 SERVES OFFICE 124

NOTES:

1. REFER TO FLOOR PLANS FOR LOCATION OF UNITS.
2. TC CONTRACTOR SHALL FURNISH CONTROL VALVE FOR HEATING COIL CONTROL. SELECT MODULATING PRESSURE INDEPENDENT CONTROL VALVE TO ACHIEVE THE SCHEDULED FLOW RATE. CONTROL VALVE SHALL BE INSTALLED BY MECHANICAL CONTRACTOR.
3. TC CONTRACTOR SHALL FURNISH CONTROL DAMPER FOR INSTALLATION BY SHEET METAL CONTRACTOR.
4. TC CONTRACTOR SHALL PROVIDE LOW VOLTAGE CONTROL FIELD WIRING BETWEEN INDOOR UNIT CONTROLS AND THE AIR-COOLED CONDENSING UNIT.

SEQUENCE OF OPERATION:

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

1. ACU SUPPLY FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ACU SHALL OPERATE BASED ON BAS TIME OF DAY SCHEDULED OCCUPIED MODE (WITH MORNING WARM-UP), TEMPORARY OCCUPIED MODE SET FOR 2-HR WHEN ENABLED FROM OVERRIDE SWITCH ON TEMP SENSOR, AND UNOCCUPIED CYCLE MODE. IN OCCUPIED MODE, DDC SHALL RUN SF CONTINUOUSLY AND COMMAND OA DAMPER OPEN.
2. FOR OCCUPIED HEATING MODE, DDC SHALL MODULATE HWH COIL CONTROL VALVE/CYCLE ELECTRIC HEAT TO MAINTAIN SPACE HEATING TEMP SETPOINT. DX COOLING CONTROL SHALL REMAIN OFF.
3. FOR OCCUPIED COOLING MODE, DDC SHALL CYCLE DX COOLING CONTROL TO MAINTAIN SPACE COOLING TEMP SETPOINT. HWH COIL CONTROL VALVE/ELECTRIC HEAT SHALL REMAIN CLOSED/OFF.
4. FOR UNOCCUPIED HEATING MODE, DDC SHALL CYCLE ACU SF ON & OFF AND MODULATE HWH COIL CONTROL VALVE/CYCLE ELECTRIC HEAT TO MAINTAIN SPACE HEATING TEMP SETPOINT. OA DAMPER SHALL REMAIN CLOSED.
5. FOR UNOCCUPIED COOLING MODE, DDC SHALL CYCLE ACU SF ON & OFF AND CYCLE DX COOLING CONTROL TO MAINTAIN SPACE COOLING TEMP SETPOINT. OA DAMPER SHALL REMAIN CLOSED.
6. FOR UNOCCUPIED SETPOINT CONTROL, DDC SHALL PROVIDE 2°F DEADBAND.
7. WHEN ACU IS DEACTIVATED OR OPERATING IN UNOCCUPIED CYCLE MODE OR MORNING WARM-UP MODE, OA DAMPER SHALL REMAIN CLOSED.
8. DDC SHALL MONITOR UNIT FAILURE ALARM RELAY DRY CONTACTS. IF ACU FAILURE ALARM RELAY IS ACTIVATED, DDC SHALL ISSUE ALARM TO BAS.
9. SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:
   - HEATING UNOCCUPIED SETPOINT = 62°F
   - HEATING OCCUPIED SETPOINT = 70°F
   - COOLING OCCUPIED SETPOINT = 75°F
   - COOLING UNOCCUPIED SETPOINT = 80°F

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KEY PLAN

OWNER

Hamtramck Public Schools

PROJECT NAME

HVAC Improvements Phase 2 Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

DRAWN BY
JPG

CHECKED BY
SVM

APPROVED BY
SVM

SHEET NAME
TEMPERATURE CONTROLS

SHEET NO.
M8-04

ELECTRICAL SYMBOL LIST

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

SYMBOL	DESCRIPTION
FX (NL)	FIXTURE TYPE (NL INDICATES NIGHT LIGHT)
	LIGHTING FIXTURE
	DIRECT/INDIRECT LIGHTING FIXTURE
	EMERGENCY FIXTURE
	LIGHTING FIXTURE
	WALL MOUNTED LIGHTING FIXTURE
	LIGHTING FIXTURE
	DIRECTIONAL LIGHTING FIXTURE
	PENDANT LIGHTING FIXTURE
	WALL SCONCE
	LIGHTING TRACK
	TRACK LIGHTING FIXTURE
	POLE MOUNTED LIGHTING FIXTURE
	POLE MOUNTED LIGHTING FIXTURE – POST TOP
	BOLLARD LIGHTING FIXTURE
	EMERGENCY LIGHTING UNIT
	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS (SHADED AREA INDICATES FACE)
	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS (SHADED AREA INDICATES FACE)
	EXIT LIGHTING FIXTURE – WALL MOUNTED
	EXIT/EMERGENCY LIGHTING COMBO
BCELTS	BRANCH CIRCUIT EMERGENCY LIGHTING TRANSFER SWITCH
ALCR	AUTOMATIC LOAD CONTROL RELAY
LC	LIGHTING CONTROL DEVICE – REFER TO LIGHTING CONTROL SCHEDULE
XX	ROOM CONTROL DESIGNATION – REFER TO LIGHTING CONTROL SCHEDULE
S	SINGLE POLE TOGGLE SWITCH
S2	TWO POLE TOGGLE SWITCH
S3	3 WAY TOGGLE SWITCH
S4	4 WAY TOGGLE SWITCH
K	KEY OPERATED SWITCH
K3	3 WAY KEY OPERATED SWITCH
K4	4 WAY KEY OPERATED SWITCH
D	DIMMER SWITCH
D3	3 WAY DIMMER SWITCH
DO	DIMMER OCCUPANCY SENSOR SWITCH
DL	LOW VOLTAGE DIMMER SWITCH
SP	PILOT SWITCH

SYMBOL	DESCRIPTION
TWC	TWO-WAY COMMUNICATION SYSTEM CALL STATION
TWCD	TWO-WAY COMMUNICATION SYSTEM AUTO DIALER
TWCA	TWO-WAY COMMUNICATION SYSTEM ANNUNCIATOR & COMMUNICATION PANEL
TWCP	TWO-WAY COMMUNICATION SYSTEM POWER SUPPLY WITH BATTERY BACK-UP
TWCDP	TWO-WAY COMMUNICATION SYSTEM AUTO DIALER POWER SUPPLY WITH BATTERY BACK-UP
RGP	REMOTE GENERATOR ANNUCIATOR PANEL
ATS	AUTOMATIC TRANSFER SWITCH
UPS	UNINTERRUPTIBLE POWER SUPPLY
CSX	LOW VOLTAGE CONTROL STATION "X" INDICATES TYPE
"X"	SINGLE/DUPLEX RECEPTACLE OUTLET "X" INDICATES TYPE
	SINGLE/DUPLEX RECEPTACLE OUTLET CONTROLLED BY AUTOMATIC CONTROL DEVICE/SYSTEM
	QUAD RECEPTACLE OUTLET
HH	ABOVE COUNTER DUPLEX RECEPTACLE (SIMILAR FOR TAMPER RESISTANT, QUADS, EMERGENCY, USB AND GFCI RECEPTACLES)
X	CONDUIT SLEEVE WITH BUSHINGS LENGTH AS REQUIRED "X" INDICATES CONDUIT SIZE
	DUPLEX RECEPTACLE–GROUND FAULT CIRCUIT INTERRUPTER
	CONDUIT UP
	CONDUIT DOWN
	DEAD FRONT–GROUND FAULT CIRCUIT INTERRUPTER
	DUPLEX EMERGENCY RECEPTACLE OUTLET
	DUPLEX TAMPER RESISTANT RECEPTACLE OUTLET
	QUAD TAMPER RESISTANT RECEPTACLE OUTLET
	ABOVE COUNTER DUPLEX TAMPER RESISTANT RECEPTACLE OUTLET
X	DUPLEX UPS RECEPTACLE
X	ABOVE COUNTER TELECOMMUNICATION OUTLET "X" INDICATES TYPE
	DUPLEX RECEPTACLE WITH 2 USB PORTS OUTLET
X	4 PORT USB CHARGING STATION
	CEILING MOUNTED DUPLEX/QUAD RECEPTACLE
	POWER POLE
"X"	WALL/CEILING MOUNTED SPECIAL RECEPTACLE – REFER TO ELECTRICAL STANDARD SCHEDULES
	MULTI-OUTLET SURFACE RACEWAY
"X"	MULTI-SERVICE DROP SEE ELECTRICAL DETAILS AND DIAGRAMS SHEET "X" INDICATES TYPE
PTX	POKE-THROUGH ASSEMBLY "X" INDICATES TYPE
FBX	FLOOR SERVICE FITTING "X" INDICATES TYPE
AFX	ACCESS FLOOR SERVICE FITTING "X" INDICATES TYPE
RX	CORD REEL "X" INDICATES TYPE
S'S	DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S3'S3	3-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S4'S4	4-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
ST	DIGITAL TIME SWITCH
SI	ILLUMINATED TOGGLE SWITCH FOR CONTROL OF LIGHTING ON CRITICAL POWER–ILLUMINATED WHEN SWITCH IS IN "OFF" POSITION
SL	LOW VOLTAGE SWITCH
SO	OCCUPANCY SENSOR
SO2	OCCUPANCY SENSOR REFER TO ELECTRICAL STANDARD SCHEDULES
OS X	OCCUPANCY SENSOR "X" INDICATES TYPE

SYMBOL	DESCRIPTION
CP	CONTROL PANEL
	MOTOR
VFC	VARIABLE FREQUENCY CONTROLLER.
	MANUAL CONTROLLER
	MAGNETIC CONTROLLER
	COMBINATION MAGNETIC CONTROLLER
	NON–FUSIBLE DISCONNECT SWITCH
	FUSIBLE DISCONNECT SWITCH
CB	ENCLOSED CIRCUIT BREAKER
	PUSH BUTTON STATION
	JUNCTION BOX
	HARD WIRE POWER CONNECTION
	GROUND ROD
	GROUND CONNECTION
HH	HANDHOLE
ACCP	ACCESS CONTROL CONTROL PANEL
ACPS	ACCESS CONTROL POWER SUPPLY
	CIRCUIT BREAKER
	DRAWOUT CIRCUIT BREAKER MANUALLY/ OPERATED
	DRAWOUT CIRCUIT BREAKER ELECTRICALLY/ OPERATED
	SWITCH
	AUTOMATIC OR MANUAL TRANSFER SWITCH
	FUSE
	TRANSFORMER
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	LIGHTNING ARRESTOR
X	PANELBOARD "X" INDICATES PANELBOARD NAME
	GROUND
	STRESS CONE TERMINATION
K	SECURITY KEY INTERLOCK
G	ENGINE GENERATOR
M	UTILITY METER
EMU	ELECTRONIC METERING UNIT
A	AMMETER
V	VOLTMETER
AS	AMMETER SWITCH
VS	VOLTMETER SWITCH
SPD	SURGE PROTECTIVE DEVICE
CR	CONTROL RELAY
TDR	TIME DELAY RELAY

REFER TO ELECTRICAL STANDARD SCHEDULES

SYMBOL	DESCRIPTION
	SECURITY CAMERA
MD	MOTION DETECTOR
K	SECURITY KEY SWITCH
DC	DOOR CONTACT
KP	KEY PAD
CR	CARD READER
DB	DURESS PUSH BUTTON STATION
DE	DELAYED EGRESS
REX	REQUEST TO EXIT STATION
PP	AUTOMATIC DOOR PUSH PAD OPERATOR
DO	DOOR OPERATOR
DA	DOOR ACTUATOR
AC	ACCESS CONTROL STATION
	ACCESS CONTROL CONTROL PANEL
	ACCESS CONTROL POWER SUPPLY
	CIRCUIT BREAKER
	DRAWOUT CIRCUIT BREAKER MANUALLY/ OPERATED
	DRAWOUT CIRCUIT BREAKER ELECTRICALLY/ OPERATED
	SWITCH
	AUTOMATIC OR MANUAL TRANSFER SWITCH
	FUSE
	TRANSFORMER
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	LIGHTNING ARRESTOR
X	PANELBOARD "X" INDICATES PANELBOARD NAME
	GROUND
	STRESS CONE TERMINATION
K	SECURITY KEY INTERLOCK
G	ENGINE GENERATOR
M	UTILITY METER
EMU	ELECTRONIC METERING UNIT
A	AMMETER
V	VOLTMETER
AS	AMMETER SWITCH
VS	VOLTMETER SWITCH
SPD	SURGE PROTECTIVE DEVICE
CR	CONTROL RELAY
TDR	TIME DELAY RELAY

SYMBOL	DESCRIPTION
F	MANUAL FIRE ALARM BOX
SD	SMOKE DETECTOR
DD	DUCT SMOKE DETECTOR
CO	CARBON MONOXIDE DETECTOR
RT	REMOTE TEST STATION (FOR DUCT DETECTOR)
TD	THERMAL DETECTOR
BD	PROJECTED BEAM DETECTOR
F	FIRE ALARM BELL
F	FIRE ALARM AUDIBLE NOTIFICATION APPLIANCE
F XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
XX	FIRE ALARM COMBINATION VISUAL/ AUDIBLE "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
F XX	FIRE ALARM COMBINATION VISUAL/ AUDIBLE NOTIFICATION APPLIANCE– CEILING MOUNTED "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE CEILING MOUNTED "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
F	FIRE ALARM AUDIBLE NOTIFICATION APPLIANCE – CEILING MOUNTED
F	FIREFIGHTERS PHONE JACK
FACP	FIRE ALARM CONTROL PANEL
FAA	FIRE ALARM ANNUNCIATOR PANEL
NAC	NOTIFICATION APPLIANCE CIRCUIT EXTENDER PANEL
IM	ADDRESSABLE MONITORING MODULE
CM	ADDRESSABLE CONTROL MODULE
TS	TAMPER SWITCH
FS	FLOW SWITCH
DR	MAGNETIC DOOR RELEASE
	THERMAL OVERLOAD RELAY
	NORMALLY OPEN CONTACTS
	NORMALLY CLOSED CONTACTS
	N.O. PUSH BUTTON SINGLE CIRCUIT
	N.C. PUSH BUTTON SINGLE CIRCUIT
X–X	CABLE VAULT "X–X" INDICATES TYPE
	BRANCH CIRCUIT PANELBOARD
	LOAD CENTER
	MOTOR CONTROL CENTER
T	TRANSFORMER
	DISTRIBUTION PANEL
GB	GROUND BUS
PB	PLUG IN BUSWAY
FB	FEEDER BUSWAY

ELECTRICAL DRAWING INDEX

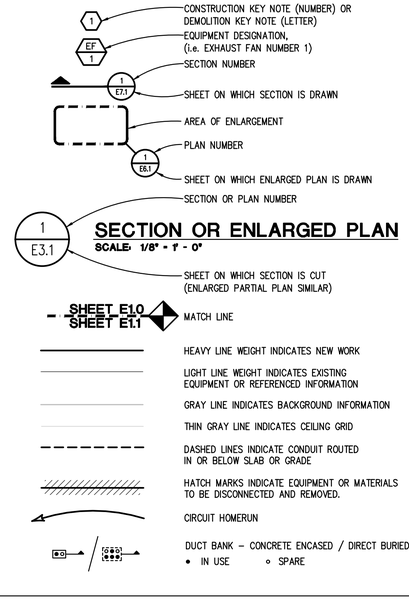
ELECTRICAL ABBREVIATION LIST

ABBREVIATION	DESCRIPTION
A	AMPERES
AER	ARC ENERGY REDUCTION
AF	AMPERES FRAME (BREAKER RATING)
AFCI	ARC FAULT CIRCUIT INTERRUPTER
A.F.F.	ABOVE FINISH FLOOR
AIC	AMPS INTERRUPTING CAPACITY
AL	AUDIENCE LEFT
ALCR	AUTOMATIC LOAD CONTROL RELAY
AR	AUDIENCE RIGHT
AT	AMPERES TRIP (BREAKER SETTING)
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
BCELTS	BRANCH CIRCUIT EMERGENCY LIGHTING TRANSFER SWITCH
BKR	BREAKER
BPS	BOLTED PRESSURE SWITCH
C	CONDUIT
CB	CIRCUIT BREAKER
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CKT	CIRCUIT
CT	CURRENT TRANSFORMER
DEMO	DEMOLITION
DIM	DIMENSION
DISC	DISCONNECT
DP	DISTRIBUTION PANEL
DS	DOWNSTAGE
DWG	DRAWING
EBU	EMERGENCY BATTERY UNIT
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRICAL
EM/ EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EO	ELECTRICALLY OPERATED
EPO	EMERGENCY POWER OFF
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
FA	FIRE ALARM
FLA	FULL LOAD AMPS
FLR	FLOOR
FOH	FRONT OF HOUSE
FSEC	FOOD SERVICE EQUIPMENT CONTRACTOR
FU	FUSE
G/GRD/EG	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
HOA	HAND–OFF–AUTO
HP	HORSEPOWER
HV	HIGH VOLTAGE
HZ	HERTZ
IG	ISOLATED GROUND

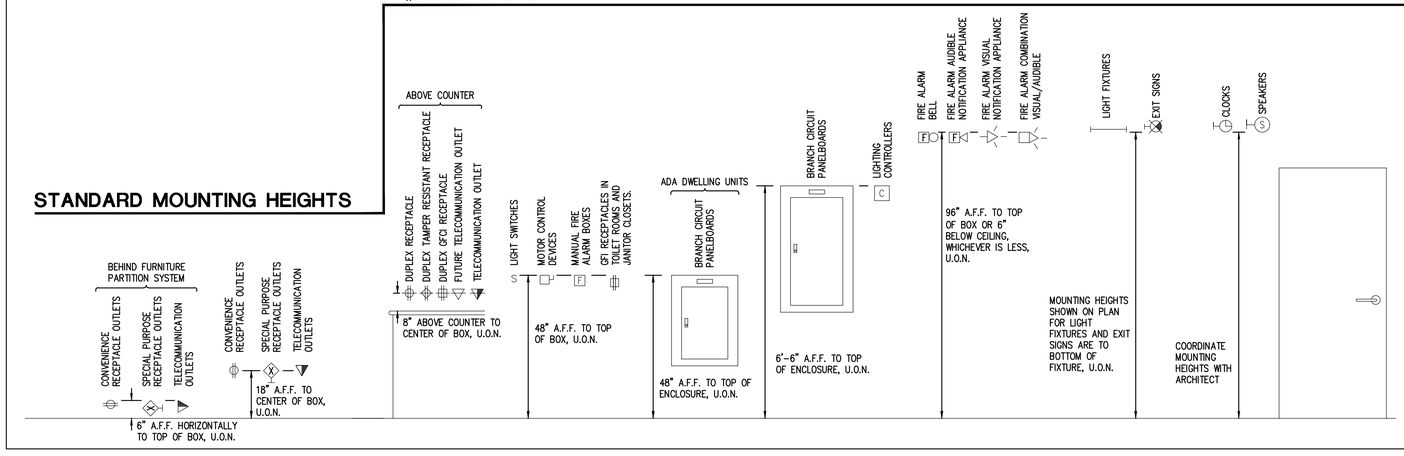
ABBREVIATION	DESCRIPTION
JB	JUNCTION BOX
KA	THOUSAND AMP
KV	KILOVOLT
KVA	KILOVOLT – AMPERES
KW	KILOWATT
KWH	KILOWATT – HOURS
LA	LIGHTNING ARRESTOR
LP	LIGHTING PANEL
LDP	LIGHTING DISTRIBUTION PANEL
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MIN	MINIMUM
MISC.	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MOP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
MTG	MOUNTING
MTR	MOTOR
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NF	NON–FUSIBLE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED

ABBREVIATION	DESCRIPTION
P	POLE
PB	PUSHBUTTON STATION
PH	PHASE
PT	POTENTIAL TRANSFORMER
PDP	POWER DISTRIBUTION PANEL
RECEPT.	RECEPTACLE
RDP	RECEPTACLE DISTRIBUTION PANEL
RP	RECEPTACLE PANEL
RSC	RIGID STEEL CONDUIT
SCCR	SHORT CIRCUIT CURRENT RATING
SCHED	SCHEDULE
SPD	SURGE PROTECTION DEVICE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TB	TERMINAL BOX
TELECOM	TELECOMMUNICATIONS
TR	TAMPER RESISTANT
TTB	TELEPHONE TERMINAL BACKBOARD
TYP	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
US	UPSTAGE
V	VOLTS
W	WIRE OR WATTS
WG	WIRE GUARD
WP	WEATHERPROOF
WR	WEATHER RESISTANT
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
(E)	EXISTING
(R)	RELOCATED

STANDARD METHODS OF NOTATION



STANDARD MOUNTING HEIGHTS



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KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

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SHEET NAME
ELECTRICAL STANDARDS AND DRAWING INDEX

SHEET NO.
E0-01

FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE - GENERAL PURPOSE

OVERCURRENT DEVICE RATING (AMPERES)	COPPER CONDUCTORS						KEYED NOTES	ALUMINUM CONDUCTORS				
	WIRE SIZE (AWG OR KCMIL)		CONDUIT SIZE					WIRE SIZE (AWG OR KCMIL)		CONDUIT SIZE		
	PHASE & NEUTRAL	GROUND	SINGLE PHASE 2 WIRE+G (1PH, 1N, 1G, 2PH, 1G)	SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	THREE PHASE 3 WIRE+G (3PH, 1G)	THREE PHASE & NEUTRAL 4 WIRE+G (3PH, 1N, 1G)		PHASE & NEUTRAL	GROUND	SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	THREE PHASE 3 WIRE+G (3PH, 1G)	THREE PHASE & NEUTRAL 4 WIRE+G (3PH, 1N, 1G)
15–20	12	12	3/4"	3/4"	3/4"	3/4"		NOT ACCEPTABLE				
25–30	10	10	3/4"	3/4"	3/4"	3/4"						
35–40	8	10	3/4"	3/4"	3/4"	3/4"						
45–50	8 (6)	10	3/4"	3/4"	3/4"	3/4"	1					
60	6 (4)	10	3/4" (1")	3/4" (1")	3/4" (1")	1" (1 1/4")	1					
70	4	8	1"	1 1/4"	1 1/4"	1 1/4"						
80	4 (3)	8	1"	1 1/4"	1 1/4"	1 1/4"	1					
90–100	3 (2)	8	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1	1	6	1 1/2"	1 1/2"	1 1/2"
110	2 (1)	6	–	1 1/4"	1 1/4"	1 1/4" (1 1/2")	1	1/0	4	1 1/2"	1 1/2"	2"
125	1 (1/0)	6	–	1 1/4" (1 1/2")	1 1/4" (1 1/2")	1 1/2"	1	2/0	4	1 1/2"	1 1/2"	2"
150	1/0	6	–	1 1/2"	1 1/2"	1 1/2"		3/0	4	2"	2"	2 1/2"
175	2/0	6	–	2"	2"	2"		4/0	4	2"	2"	2 1/2"
200	3/0	6	–	2"	2"	2 1/2"		250	4	2"	2"	3"
225	4/0	4	–	2"	2"	2 1/2"		300	2	2 1/2"	2 1/2"	3"
250	250	4	–	2 1/2"	2 1/2"	2 1/2"		350	2	2 1/2"	2 1/2"	3"
300	350	4	–	2 1/2"	2 1/2"	3"		500	2	3"	3"	3 1/2"
350	500	3	–	3"	3"	3"		2–4/0	2–1/0	2–2"	2–2"	2–2"
400	500	3	–	3"	3"	3"		2–250	2–1/0	2–2 1/2"	2–2 1/2"	2–2 1/2"
450	2–4/0	2–2	–	2–2"	2–2"	2–2 1/2"		2–300	2–1/0	2–2 1/2"	2–2 1/2"	2–3"
500	2–250	2–2	–	2–2 1/2"	2–2 1/2"	2–2 1/2"		2–350	2–1/0	2–2 1/2"	2–2 1/2"	2–3"
600	2–350	2–1	–	2–2 1/2"	2–2 1/2"	2–3"		2–500	2–2/0	2–3"	2–3"	2–3 1/2"
700	2–500	2–1/0	–	2–3"	2–3"	2–3"		2–600	2–3/0	2–3"	2–3"	2–3 1/2"
800	2–500	2–1/0	–	2–3"	2–3"	2–3 1/2"		3–400	3–3/0	3–3"	3–3"	3–3 1/2"
1000	3–400	3–2/0	–	3–3"	3–3"	3–3"		3–600	3–4/0	–	3–3 1/2"	3–3 1/2"
1200	3–600	3–3/0	–	3–3 1/2"	3–3 1/2"	3–3 1/2"		4–500	4–250	–	4–3"	4–3 1/2"
1600	4–600	4–4/0	–	4–3 1/2"	4–3 1/2"	4–3 1/2"		5–600	5–350	–	5–3 1/2"	5–4"
2000	5–600	5–250	–	5–3 1/2"	5–3 1/2"	5–3 1/2"		6–600	6–400	–	6–3 1/2"	6–4"

GENERAL NOTES:
1. CONTRACTOR TO SIZE FEEDERS AND BRANCH CIRCUITS BASED ON THIS SCHEDULE AND OVER CURRENT DEVICE SIZE, UNLESS NOTED OTHERWISE.
2. CONTRACTOR MAY COMBINE 20A CIRCUITS AS NOTED IN SPECIFICATION.
3. COPPER CONDUCTORS ARE BASED ON THHN/THWN UP TO AND INCLUDING #4/0. COPPER CONDUCTORS LARGER THAN #4/0 AND ALUMINUM CONDUCTORS ARE BASED ON XHHW-2.
4. CONDUIT SIZES ARE VALID FOR EMT OR RGS. CONDUIT SIZES SHALL BE ADJUSTED AS REQUIRED FOR OTHER TYPES OF CONDUIT.
5. ELECTRICAL CONTRACTOR TO COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE REQUIRED WIRE SIZES TO ACCOMMODATE MECHANICAL EQUIPMENT LUG SIZES.
6. SIZE OF DISCONNECT SWITCH LOCATED AT EQUIPMENT SHALL BE SIZED BASED UPON OVERCURRENT PROTECTION OF THAT DEVICE.
7. OBTAIN APPROVAL FROM ENGINEER PRIOR TO INSTALLING DIFFERENT SIZE/QUANTITY OF CONDUCTORS TO OBTAIN AN EQUIVALENT AMPACITY.
8. SPLICE FROM ALUMINUM TO COPPER PRIOR TO ENTERING EQUIPMENT LISTED FOR USE WITH COPPER CONDUCTORS ONLY OR USE COPPER CONDUCTORS FOR THE ENTIRE LENGTH OF FEEDER.

KEYED NOTES:
1. CONDUCTORS ARE BASED ON 90°C, 600V. INSULATED WIRE APPLIED AT 75°C FOR TERMINATION RATED 60/75°C OR 75°C. FOR TERMINATION RATED AT 60°C, USE CONDUCTORS AND CONDUIT SIZES INDICATED IN PARENTHESES.

MOTOR CIRCUIT SIZING SCHEDULE (208V, 3 PHASE)

MOTOR HP	SWITCH/ FUSE	CIRCUIT BREAKER	STARTER SIZE/TYPE	MOTOR DISCONNECT (NOTE 3)
1/2	30/6A	15A	1	30A
3/4	30/6A	15A	1	30A
1	30/10A	15A	1	30A
1 1/2	30/10A	15A	1	30A
2	30/10A	15A	1	30A
3	30/20A	20A	1	30A
5	30/25A	35A	1	30A
7 1/2	60/40A	50A	1	60A
10	60/50A	60A	2	60A
15	60/60A	90A	3	60A
20	100/90A	100A	3	100A
25	100/100A	110A	3	100A
30	200/125A	125A	4	200A
40	200/175A	175A	4	200A
50	200/200A	200A	5	200A
60	400/250A	250A	5	400A
75	400/300A	300A	5	400A
100	400/400A	400A	6	400A
125	600/500A	600A	6	600A
150	600/600A	600A	6	600A

GENERAL NOTES:
1. BASED ON MOTOR FULL LOAD AMPERES AS PROVIDED BY THE NEC
2. BASED ON MOTOR RUNNING OVERLOAD PROTECTIONS PROVIDED BY THERMAL OVERLOAD RELAYS.
3. WHERE THE STARTER IS LOCATED REMOTE FROM THE MOTOR, PROVIDE DISCONNECT LOCATED AT THE MOTOR, SIZE AS INDICATED.

MOTOR CIRCUIT SIZING SCHEDULE (120V, SINGLE PHASE)

MOTOR HP	CIRCUIT BREAKER	MANUAL MOTOR STARTER SIZE	COMBINATION STARTER SIZE	MOTOR DISCONNECT (NOTE 3)
1/6	15A	1 HP	0	20A
1/4	15A	1 HP	0	20A
1/3	15A	1 HP	0	20A
1/2	20A	1 HP	0	20A

GENERAL NOTES:
1. BASED ON MOTOR FULL LOAD AMPERES AS PROVIDED BY THE NEC
2. BASED ON MOTOR RUNNING OVERLOAD PROTECTIONS PROVIDED BY THERMAL OVERLOAD RELAYS.
3. WHERE THE STARTER IS LOCATED REMOTE FROM THE MOTOR, PROVIDE DISCONNECT LOCATED AT THE MOTOR, SIZE AS INDICATED.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	VOLTAGE	(QTY.) LAMPS	MANUFACTURERS
L1	LED 2'X4' SURFACE MOUNTED FLAT PANEL LIGHT FIXTURE: ALUMINUM BEZEL, STEEL BACKING AND WHITE FROST ACRYLIC DIFFUSER. 0–10 VOLT DIMMING TO 1% PROVIDE 2'X4' SURFACE MOUNT TROFFER KIT. FOR FIXTURES INDICATED AS EMERGENCY ON PLAN, PROVIDE AUTOMATIC LOAD CONTROL RELAY.	120/277V	LED 4000K WHITE 4,000 MIN LUMENS 80 CRI MINIMUM	1. LITHONIA EPNL SERIES 2. COLUMBIA CFP SERIES 3. METALUX 24FP SERIES

COORDINATE WITH ARCHITECTURAL PLANS FOR CEILING TYPES.

ALL LED FIXTURES SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:
MULTI-VOLT ELECTRONIC DRIVER, MINIMUM OF 50,000 HOURS OPERATION WITH GREATER THAN 70% DELIVERED LUMEN OUTPUT.
LUMENS SHALL BE DELIVERED LUMENS.
INDOOR DRIVERS SHALL BE RATED FOR A MINIMUM 65°C.
OUTDOOR DRIVERS SHALL BE RATED FOR MINIMUM -20°C.
DRIVER SHALL BE LABELED TO COMPLY WITH NEMA SSL1, AND THD OF LESS THAN 20%.
DRIVER SHALL BE SERVICEABLE FROM BELOW CEILING.
LUMINAIRE SHALL COMPLY WITH IES STANDARDS LM-79 AND LM-80.

RACEWAY / CONDUCTOR / CABLE APPLICATION SCHEDULE

		WIRE			RACEWAY								CABLE/CORD		
		COPPER, TYPE THHN/THWN-2	COPPER, TYPE XHHW-2	ALUMINUM, TYPE XHHW-2 (100A AND ABOVE ONLY)	ELECTRICAL METALLIC TUBING (EMT)	INTERMEDIATE METAL CONDUIT (IMC)	RIGID STEEL CONDUIT (RSC)	RIGID NON-METALLIC CONDUIT (RNC) TYPE EPC-40	FLEXIBLE METAL CONDUIT (FMC)	LIQUID TIGHT FLEXIBLE METAL CONDUIT (LFMC)	SURFACE RACEWAY	METAL CLAD TYPE CABLE WITH INSULATED GROUND WIRE (TYPE MC)	VFC CABLE	POWER LIMITED CABLE
FEEDERS – EXTERIOR	EXPOSED, SURFACE MOUNTED TO STRUCTURE		X	X		X	X							
	EXPOSED, WITH FREESTANDING SUPPORT		X	X		X	X							
	BELOW PARKING LOTS AND ROADWAYS		X	X										
	ROOFTOPS (WHEN APPROVED BY ENGINEER)		X	X		X	X							
FEEDERS – INTERIOR	CONCEALED, ACCESSIBLE CEILINGS	X		X	X	X								
	CONCEALED, INACCESSIBLE CEILINGS	X		X	X	X								
	CONCEALED IN GYPSUM BOARD PARTITION WALLS	X		X	X	X								
	EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE	X		X		X	X							
	EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE	X		X	X	X								
	EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	X		X	X	X								
	EXPOSED, FINISHED SPACES	X		X							X			
	DAMP AND WET LOCATIONS	X		X		X	X	X						
BRANCH CIRCUITS – EXTERIOR	EXPOSED, SURFACE MOUNTED TO STRUCTURE		X			X	X							
	EXPOSED, WITH FREESTANDING SUPPORT		X			X	X							
	ROOFTOPS (WHEN APPROVED BY ENGINEER)		X			X	X							
BRANCH CIRCUITS – INTERIOR	CONCEALED, ACCESSIBLE CEILINGS	X			X	X						X		
	CONCEALED, INACCESSIBLE CEILINGS	X			X	X								
	CONCEALED IN GYPSUM BOARD PARTITION WALLS	X			X	X			X			X		
	EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE	X				X	X							
	EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE	X			X	X					X			
	EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	X			X	X								
	EXPOSED, FINISHED SPACES	X									X			
	DAMP AND WET LOCATIONS	X				X	X	X		X				
SPECIAL APPLICATIONS	SERVICE ENTRANCE – UNDERGROUND		X	X				X						
	CONNECTION BETWEEN VFC AND MOTORS (KEYED NOTE 1)												X	
	CLASS 1 CONTROL CIRCUITS	X			X	X	X							
	CLASS 2 CONTROL CIRCUITS	X			X	X	X							X
	CLASS 3 CONTROL CIRCUITS	X			X	X	X							X
	CONNECTIONS TO TRANSFORMERS, MOTORS AND VIBRATING EQUIPMENT		X							X				

GENERAL NOTES:
1. TRANSITION FROM PVC/HDPE AND PROVIDE RIGID STEEL OR RTRC SWEEPS WHERE CONDUITS PENETRATE WALLS, CONCRETE SLABS, CONCRETE BASES, AND ASPHALT.
2. REFER TO SPECIFICATIONS FOR RESTRICTIONS ON MC/AC CABLE INSTALLATION.
3. EMT SHALL NOT BE USED ON THE EXTERIOR OF A BUILDING OR IN AREAS SUBJECT TO DAMAGE BELOW 10' AFF.
4. INSTALL SURFACE RACEWAYS ONLY WHERE INDICATED ON DRAWINGS.

KEYED NOTES:
1. NON-ARMORED CABLE SHALL BE INSTALLED IN RACEWAY. ARMORED CABLE SHALL BE INSTALLED IN TRAY OR FREE-AIR AS APPLICABLE.

LIGHTING CONTROL SCHEDULE

PLAN REFERENCE	ROOM TYPE	LOCAL CONTROL		CONTROL ON / OFF	SENSOR TYPE	TURN ON LIGHTING TO %	BI-LEVEL CONTROL	DAYLIGHT			SENSOR PARTIAL OFF		SENSOR FULL OFF TIME	TIME-CLOCK SCHEDULE	EMERGENCY LIGHTING CIRCUIT CONTROL	HVAC CONTROL	NOTES
		SWITCH TYPE	SWITCH CONTROL					SIDE LIGHT	TOP LIGHT	MAINTAIN FC LEVEL	TIME	%					
A	CLASSROOM/LECTURE HALL/TRAINING ROOM (ALL OTHER CLASSROOMS/LECTURE HALLS/TRAINING ROOMS)	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	NA	NA	NA	NA	NA	20 MIN	NA	ALCR	YES	

NA = NOT APPLICABLE

NOTE:
1. REFER TO PLANS FOR LOCATION OF LOCAL CONTROL.
2. REFER TO PLANS FOR PRIMARY AND SECONDARY DAYLIGHT ZONES.
3. PROVIDE EMERGENCY LIGHTING CIRCUIT CONTROL (ELTD OR ALCR) PER SWITCHING CIRCUIT AS REQUIRED.
4. CONTRACTOR SHALL PROVIDE FLOOR PLAN INDICATING SENSOR LOCATIONS OF CHOSEN CONTROL SYSTEM.
5. REFER TO LUMINAIRE SCHEDULE FOR FIXTURE CHARACTERISTICS.
6. LIGHTING SENSOR SHALL HAVE CONTACT FOR HVAC CONTROL WHEN A "YES" SELECTION IS MADE IN THE HVAC CONTROL COLUMN.

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

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PROJECT NAME
HVAC Improvements Phase 2 Early Childhood

11680 McDougall St
Hamtramck, MI 48212

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22-118

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Bidding - Construction	08/30/2022

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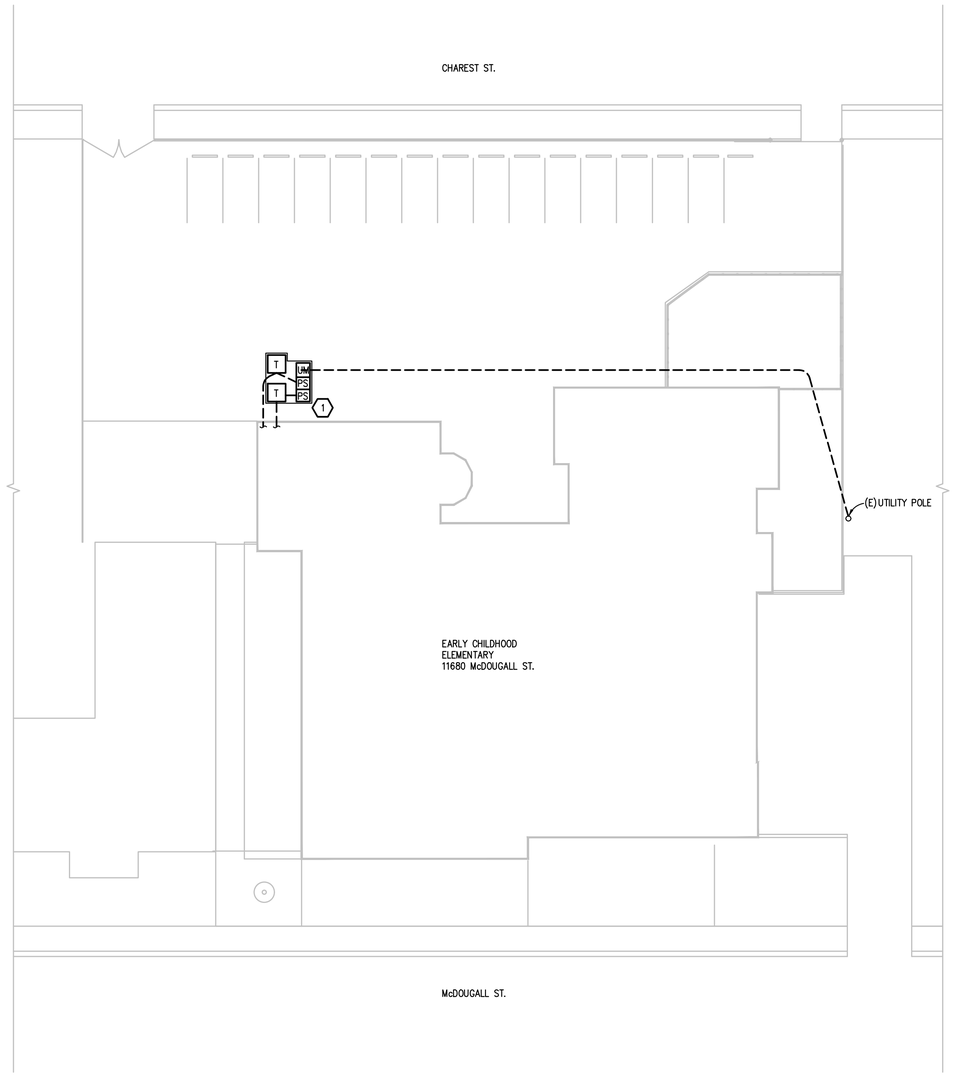
SHEET NAME
ELECTRICAL STANDARD SCHEDULES

SHEET NO.
E0-02

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



ELECTRICAL SITE PLAN
SCALE: 1" = 20'

SITE PLAN GENERAL NOTES:

1. THESE NOTES ARE GENERIC GUIDELINES ONLY. ELECTRICAL CONTRACTOR'S PERSONNEL ON SITE SHALL BE THOROUGHLY FAMILIAR WITH THE PUBLISHED SPECIFICATIONS FOR EXACT DESCRIPTIONS OF SCOPE, METHODS, AND MATERIAL.
2. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
3. CONDUCT A SURVEY TO IDENTIFY ALL UNDERGROUND UTILITIES. CALL 811 PRIOR TO EXCAVATION.
4. UTILITIES SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY. COORDINATE EXACT LOCATION OF ALL EXISTING UTILITIES, AND ROUTING OF ALL NEW UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
5. DEWATER TRENCHES PRIOR TO INSTALLATION OF CONDUITS. PROVIDE WATER TIGHT FITTINGS ON ALL UNDERGROUND CONDUITS.
6. COORDINATE DEMOLITION WORK, AND ELECTRICAL AND TELEPHONE SERVICES TO THE SITE, WITH THE RESPECTIVE LOCAL UTILITY COMPANY REPRESENTATIVES PRIOR TO COMMENCEMENT OF WORK. INCLUDE ALL ASSOCIATED COST/FEES BY THE UTILITY COMPANIES IN THE BID PRICE.
7. INSTALL UNDERGROUND CONDUITS 42" BELOW FINISHED GRADE, MINIMUM, UNLESS NOTED OTHERWISE.
8. COORDINATE SERVICE SHUT-DOWNS WITH ALL TRADES INVOLVED ON SITE AND OBTAIN WRITTEN AUTHORIZATION FROM OWNER 72 HOURS PRIOR TO ANY ELECTRICAL AND/OR TELEPHONE SHUT-DOWN.
9. REMOVE ALL DE-ENERGIZED CONDUCTORS FROM SITE AT COMPLETION OF THE PROJECT.
10. SPARE CONDUITS SHALL INCLUDE PULL STRING AND SHALL BE TERMINATED WITH A CAP.
11. EXCAVATE THE ENTIRE LENGTH OF TRENCH TO PROPERLY SET DUCT ELEVATIONS.

(#) CONSTRUCTION KEY NOTES:

1. REFER TO DRAWINGS E3-02 AND E5-01.

Know what's **below.**
Call before you dig.

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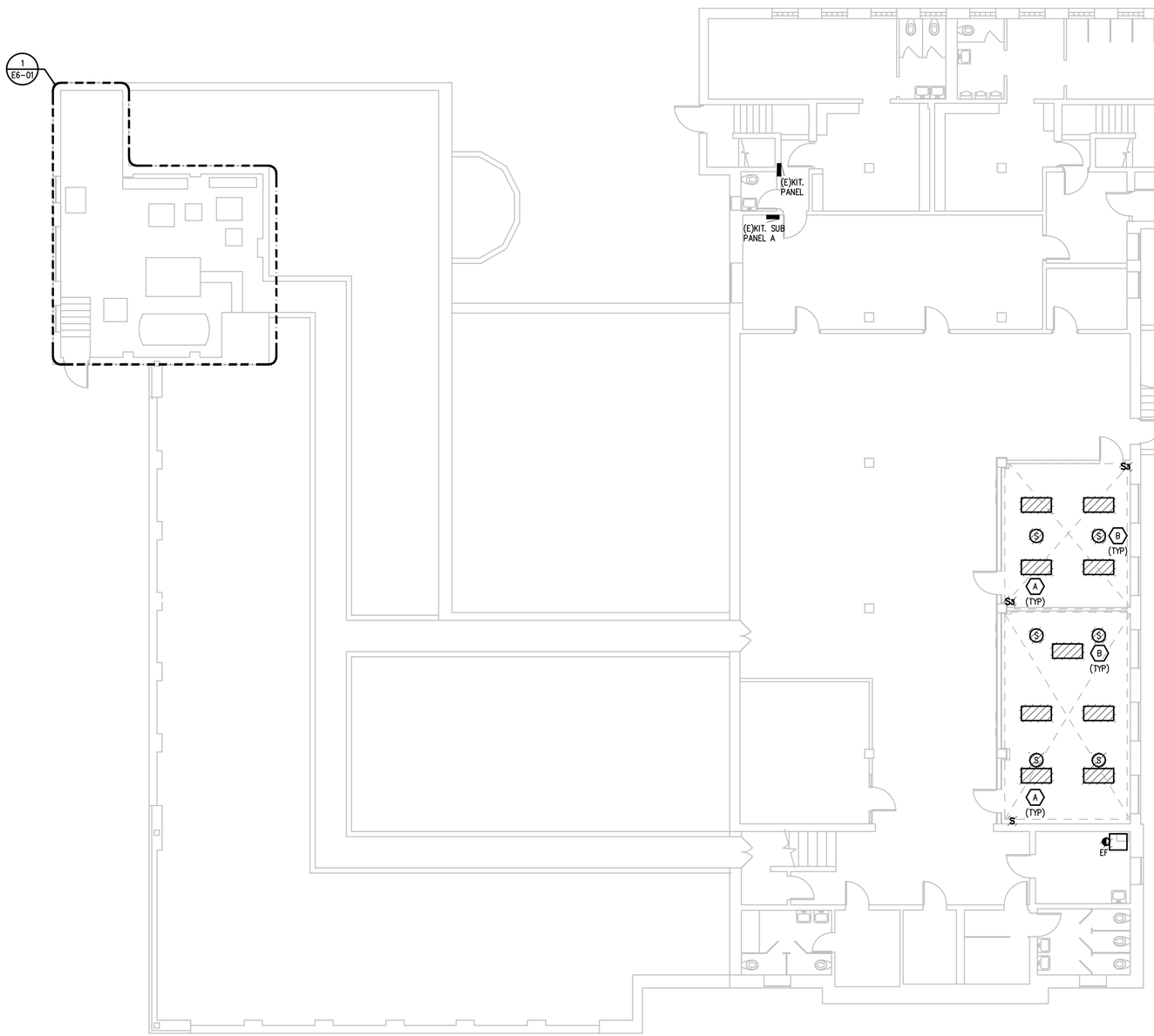
SHEET NAME
ELECTRICAL SITE PLAN

SHEET NO.
E0-03

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



LOWER LEVEL ELECTRICAL DEMOLITION PLAN
SCALE: 1/8" = 1' - 0"

ELECTRICAL DEMOLITION GENERAL NOTES:

1. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
2. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
3. REMOVE EQUIPMENT OR MATERIALS AS INDICATED ON PLAN WITH CROSS HATCHING. DEMOLITION SHALL INCLUDE, BUT NOT BE LIMITED TO, THOSE COMPONENTS SHOWN.
4. COORDINATE WITH NEW WORK PLANS, ONE LINE DIAGRAMS AND RISER DIAGRAMS FOR EXTENT OF DEMOLITION WORK.
5. PROVIDE PROPER SUPPORT FOR EXISTING TO REMAIN CONDUITS AND BOXES WHERE EXISTING SUPPORT IS TO BE REMOVED. RE-ROUTE BRANCH CIRCUIT CONDUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
6. REMOVE ALL CONDUIT AND WIRE BACK TO THE SOURCE OR NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
7. MAINTAIN ELECTRICAL SERVICE TO ALL LIGHTING FIXTURES, DEVICES AND EQUIPMENT THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM LOADS THAT ARE TO REMAIN.
8. DISPOSE OF ALL MATERIALS OFF SITE AND INCLUDE ALL COSTS FOR DISPOSAL IN BID. ALL MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING TCLP TESTING, PROPER DISPOSAL AND/OR RECYCLING OF FLUORESCENT LAMPS.
9. PROVIDE BLANK COVER PLATES WHERE SWITCHES AND DEVICES ARE REMOVED BUT EXISTING WALLS REMAIN INTACT.
10. RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS "SPARE".
11. PROVIDE UPDATED TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS ALTERATION.
12. VERIFY ALL UNDERGROUND AND IN SLAB UTILITY LOCATIONS PRIOR TO SAW-CUTTING OR PENETRATING ANY FLOOR SLAB.
13. COORDINATE ANY SHUT DOWN OF EXISTING SERVICES AND EQUIPMENT THAT ARE REMAINING IN USE WITH THE OWNER'S REPRESENTATIVE. WHERE EXISTING BUILDING SERVICE IS REQUIRED TO BE SHUT DOWN, INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWNS MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. COORDINATE ELECTRICAL SHUT DOWNS WITH THE OWNER 72 HOURS PRIOR TO SHUT DOWN.

(#) DEMOLITION KEY NOTES:

A. REMOVE ALL LIGHTING AND LIGHTING CONTROL EQUIPMENT. BRANCH CIRCUIT WIRING TO REMAIN FOR REUSE.

B. REMOVE AND SALVAGE SPEAKERS FOR REUSE. REFER TO NEW WORK PLANS FOR EXTENT OF WORK.

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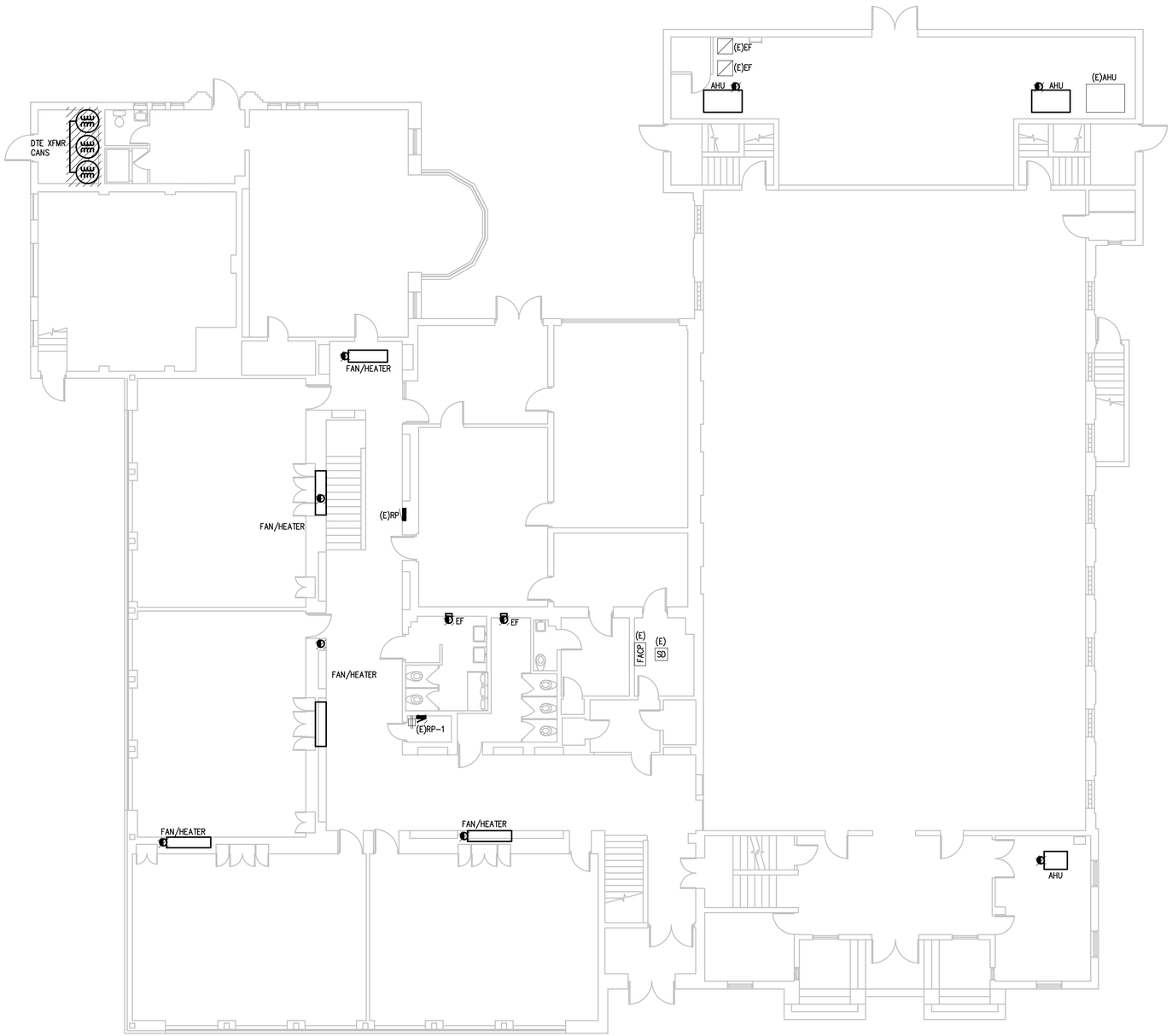
SHEET NAME
LOWER LEVEL ELECTRICAL DEMOLITION PLAN

SHEET NO.
E1-01

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



GROUND LEVEL ELECTRICAL DEMOLITION PLAN
SCALE: 1/8" = 1' - 0"

ELECTRICAL DEMOLITION GENERAL NOTES:

1. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
2. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
3. REMOVE EQUIPMENT OR MATERIALS AS INDICATED ON PLAN WITH CROSS HATCHING. DEMOLITION SHALL INCLUDE, BUT NOT BE LIMITED TO, THOSE COMPONENTS SHOWN.
4. COORDINATE WITH NEW WORK PLANS, ONE LINE DIAGRAMS AND RISER DIAGRAMS FOR EXTENT OF DEMOLITION WORK.
5. PROVIDE PROPER SUPPORT FOR EXISTING TO REMAIN CONDUITS AND BOXES WHERE EXISTING SUPPORT IS TO BE REMOVED. RE-ROUTE BRANCH CIRCUIT CONDUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
6. REMOVE ALL CONDUIT AND WIRE BACK TO THE SOURCE OR NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
7. MAINTAIN ELECTRICAL SERVICE TO ALL LIGHTING FIXTURES, DEVICES AND EQUIPMENT THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM LOADS THAT ARE TO REMAIN.
8. DISPOSE OF ALL MATERIALS OFF SITE AND INCLUDE ALL COSTS FOR DISPOSAL IN BID. ALL MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING TCLP TESTING, PROPER DISPOSAL AND/OR RECYCLING OF FLUORESCENT LAMPS.
9. PROVIDE BLANK COVER PLATES WHERE SWITCHES AND DEVICES ARE REMOVED BUT EXISTING WALLS REMAIN INTACT.
10. RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS "SPARE".
11. PROVIDE UPDATED TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS ALTERATION.
12. VERIFY ALL UNDERGROUND AND IN SLAB UTILITY LOCATIONS PRIOR TO SAW-CUTTING OR PENETRATING ANY FLOOR SLAB.
13. COORDINATE ANY SHUT DOWN OF EXISTING SERVICES AND EQUIPMENT THAT ARE REMAINING IN USE WITH THE OWNER'S REPRESENTATIVE. WHERE EXISTING BUILDING SERVICE IS REQUIRED TO BE SHUT DOWN, INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWNS MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. COORDINATE ELECTRICAL SHUT DOWNS WITH THE OWNER 72 HOURS PRIOR TO SHUT DOWN.

(#) DEMOLITION KEY NOTES:

A. REMOVE ALL LIGHTING AND LIGHTING CONTROL EQUIPMENT. BRANCH CIRCUIT WIRING TO REMAIN FOR REUSE.

B. REMOVE AND SALVAGE SPEAKERS FOR REUSE. REFER TO NEW WORK PLANS FOR EXTENT OF WORK.

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KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

DRAWN BY
SEB

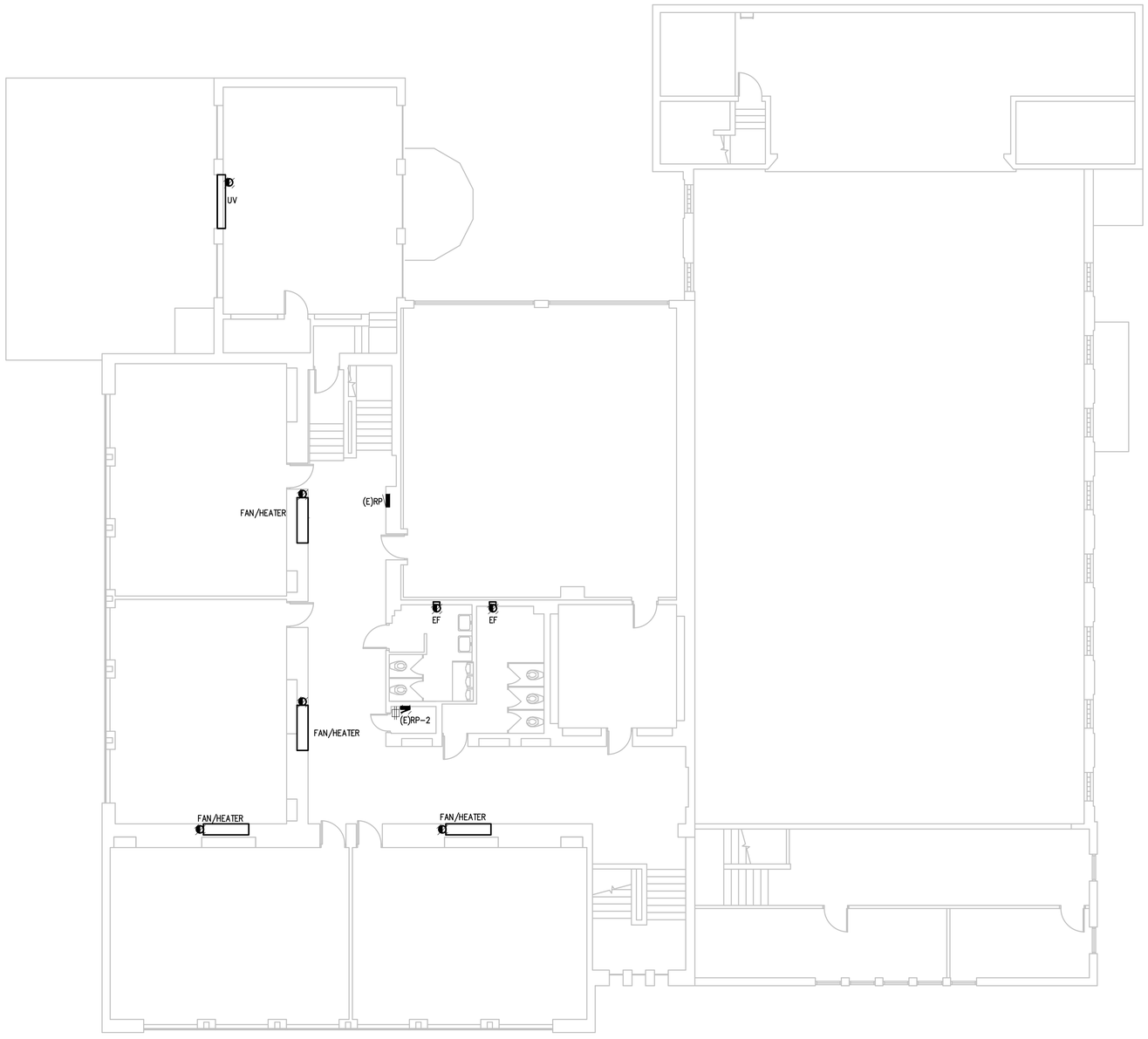
CHECKED BY
SEB

APPROVED BY
STP

SHEET NAME
GROUND LEVEL ELECTRICAL DEMOLITION PLAN

SHEET NO.
E1-02

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



UPPER LEVEL ELECTRICAL DEMOLITION PLAN
SCALE: 1/8" = 1' - 0"

ELECTRICAL DEMOLITION GENERAL NOTES:

1. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
2. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
3. REMOVE EQUIPMENT OR MATERIALS AS INDICATED ON PLAN WITH CROSS HATCHING. DEMOLITION SHALL INCLUDE, BUT NOT BE LIMITED TO, THOSE COMPONENTS SHOWN.
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10. RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS "SPARE".
11. PROVIDE UPDATED TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS ALTERATION.
12. VERIFY ALL UNDERGROUND AND IN SLAB UTILITY LOCATIONS PRIOR TO SAW-CUTTING OR PENETRATING ANY FLOOR SLAB.
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50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

DRAWN BY
SEB

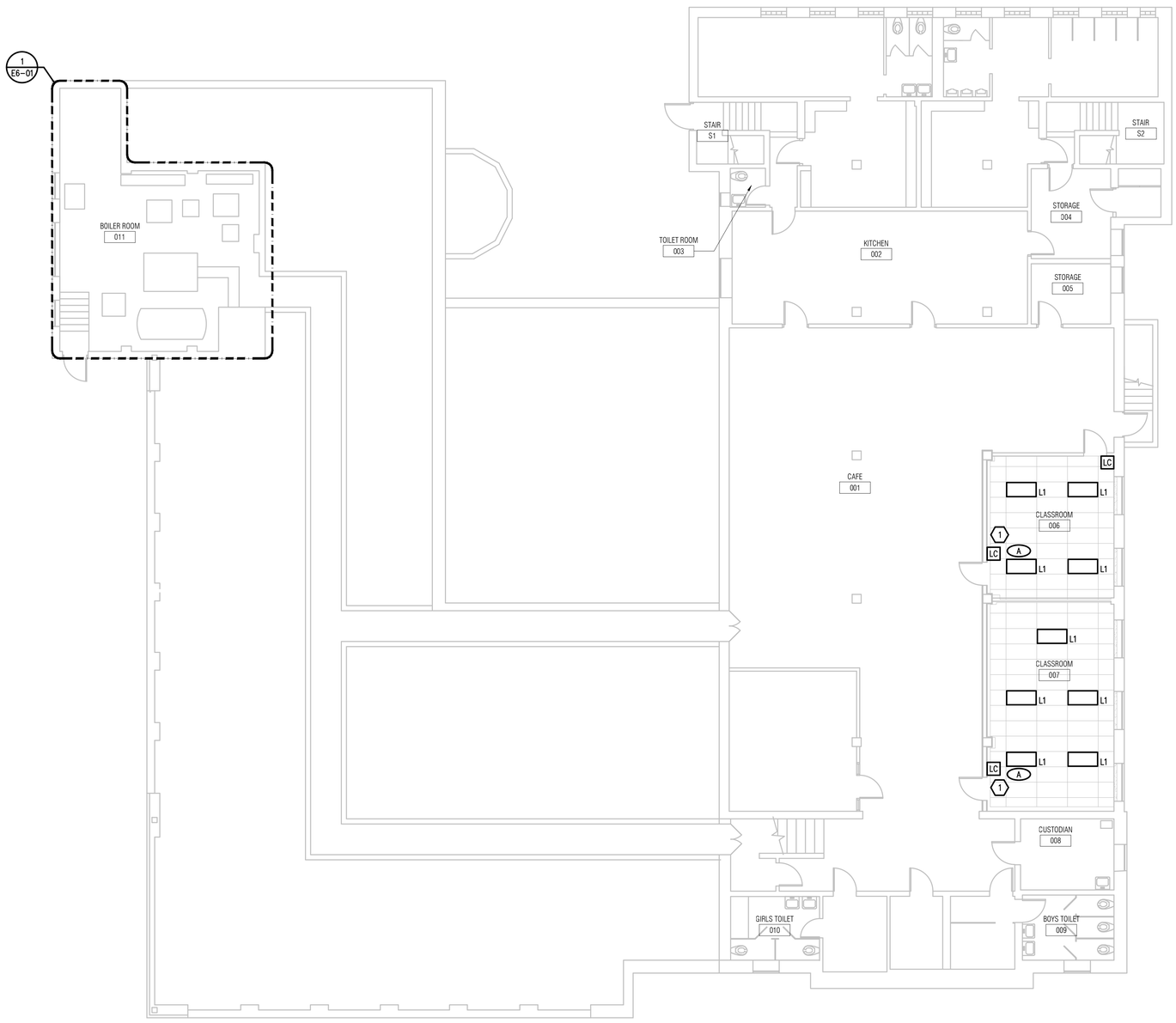
CHECKED BY
SEB

APPROVED BY
STP

SHEET NAME
UPPER LEVEL ELECTRICAL DEMOLITION PLAN

SHEET NO.
E1-03

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



LOWER LEVEL LIGHTING PLAN
SCALE: 1/8" = 1' - 0"

ELECTRICAL GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
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. 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.
4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
5. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.
7. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
8. ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING FIRE-LITE MS-10UD FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE-TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.

(#) CONSTRUCTION KEY NOTES:

1. CIRCUIT TO MAINTAINED BRANCH CIRCUIT.

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SHEET NAME
LOWER LEVEL LIGHTING PLAN

SHEET NO.
E2-01

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

LOWER LEVEL POWER PLAN
SCALE: 1/8" = 1' - 0"

ELECTRICAL GENERAL NOTES:

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(#) CONSTRUCTION KEY NOTES:

1. SMOKE DAMPER DUCT SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH THE MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE, THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT SMOKE DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR FROM A DEDICATED 120 VOLT CIRCUIT AS INDICATED. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS, COORDINATE WORK WITH THE TEMPERATURE CONTROL CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED RTU. DAMPER SHALL ALSO CLOSE UPON NORMAL SHUT DOWN OF RTU BY TC CONTRACTOR. PROVIDE ALL CONTROL MODULES, RELAYS, ETC FOR A COMPLETE SYSTEM. PROVIDE QUANTITIES AS INDICATED.
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4. CIRCUIT HEAT TRACE AS INDICATED.
5. CARBON MONOXIDE DETECTOR TO BE U.L. 2075 LISTED. CARBON MONOXIDE DETECTOR TO BE POWERED BY AND REPORT BACK TO FIRE ALARM CONTROL PANEL. FIRE ALARM SUPPLIER SHALL COORDINATE EXACT LOCATION AND QUANTITY WITH FIRE MARSHAL.

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22-118

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50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

DRAWN BY
SEB

CHECKED BY
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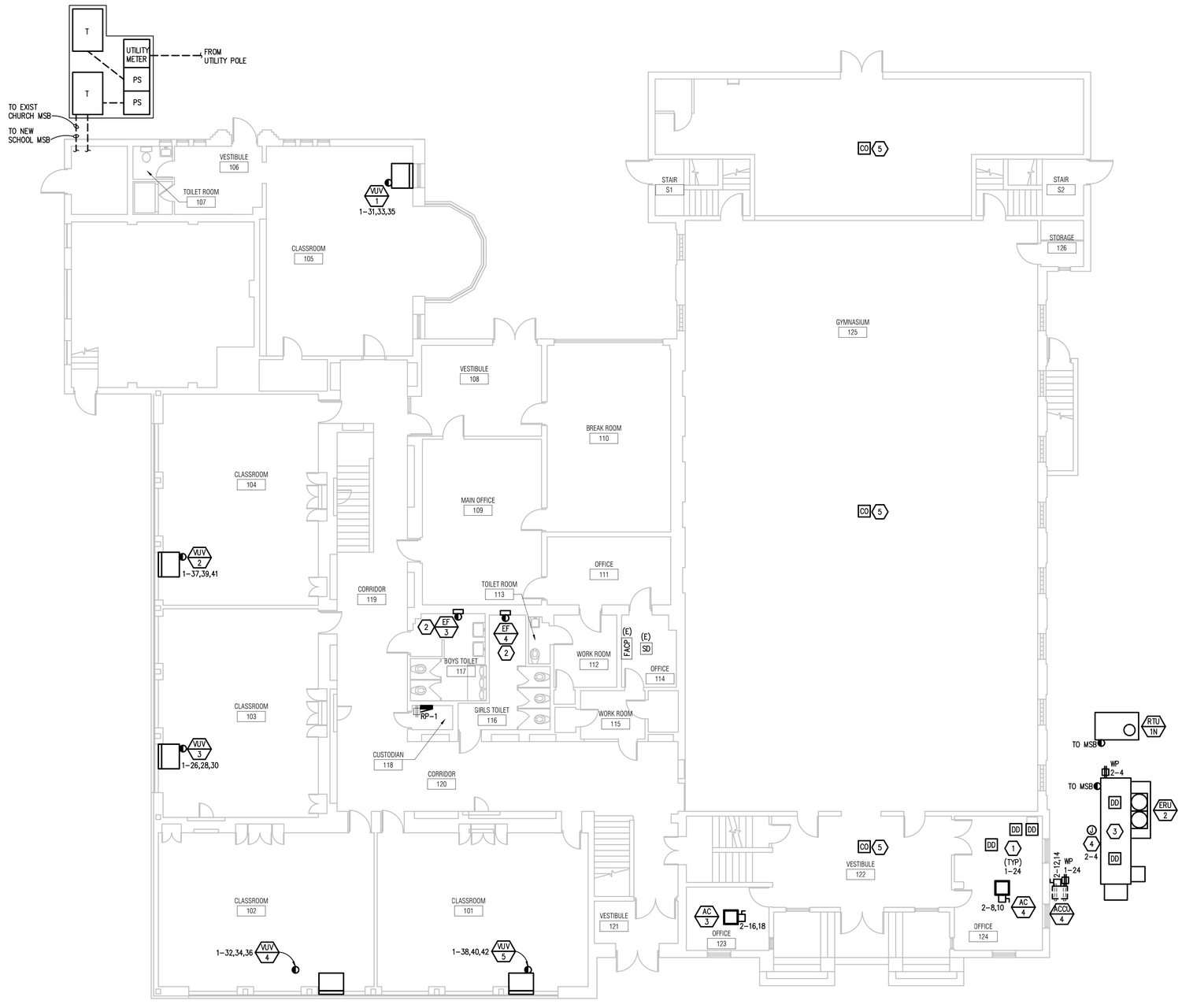
APPROVED BY
STP

SHEET NAME
LOWER LEVEL POWER PLAN

SHEET NO.
E3-01

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



GROUND LEVEL POWER PLAN
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CHECKED BY
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STP

SHEET NAME
GROUND LEVEL POWER PLAN

SHEET NO.
E3-02

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

UPPER LEVEL POWER PLAN
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8. ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING FIRE-LITE MS-10UD FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE-TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.

(#) CONSTRUCTION KEY NOTES:

1. SMOKE DAMPER DUCT SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH THE MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE, THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT SMOKE DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR FROM A DEDICATED 120 VOLT CIRCUIT AS INDICATED. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS, COORDINATE WORK WITH THE TEMPERATURE CONTROL CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED RTU. DAMPER SHALL ALSO CLOSE UPON NORMAL SHUT DOWN OF RTU BY TC CONTRACTOR. PROVIDE ALL CONTROL MODULES, RELAYS, ETC FOR A COMPLETE SYSTEM. PROVIDE QUANTITIES AS INDICATED.
2. CIRCUIT EXHAUST FAN TO LOAD SIDE OF EXISTING TOGGLE SWITCH CONTROLLING LIGHT FIXTURES WITHIN ROOM.
3. DUCT SMOKE DETECTOR SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. COORDINATE MOUNTING LOCATION AND QUANTITY WITH THE MECHANICAL DUCTWORK CONTRACTOR. ELECTRICAL CONTRACTOR SHALL WIRE DUCT SMOKE DETECTOR/RTU SUPPLY/RETURN FAN MOTOR STARTER SO THAT UPON DETECTION OF SMOKE, THE SUPPLY/RETURN FAN WILL SHUT DOWN. THIS SHALL BE ACCOMPLISHED VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WITH THE TEMPERATURE CONTROL/FIRE ALARM CONTRACTOR. PROVIDE WEATHER PROOF ENCLOSURES AS REQUIRED.
4. CIRCUIT HEAT TRACE AS INDICATED.
5. CARBON MONOXIDE DETECTOR TO BE U.L. 2075 LISTED. CARBON MONOXIDE DETECTOR TO BE POWERED BY AND REPORT BACK TO FIRE ALARM CONTROL PANEL. FIRE ALARM SUPPLIER SHALL COORDINATE EXACT LOCATION AND QUANTITY WITH FIRE MARSHAL.

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PBA Project No. 2022.0015

KEY PLAN

OWNER
Hamtramck
Public Schools

PROJECT NAME
HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.
22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

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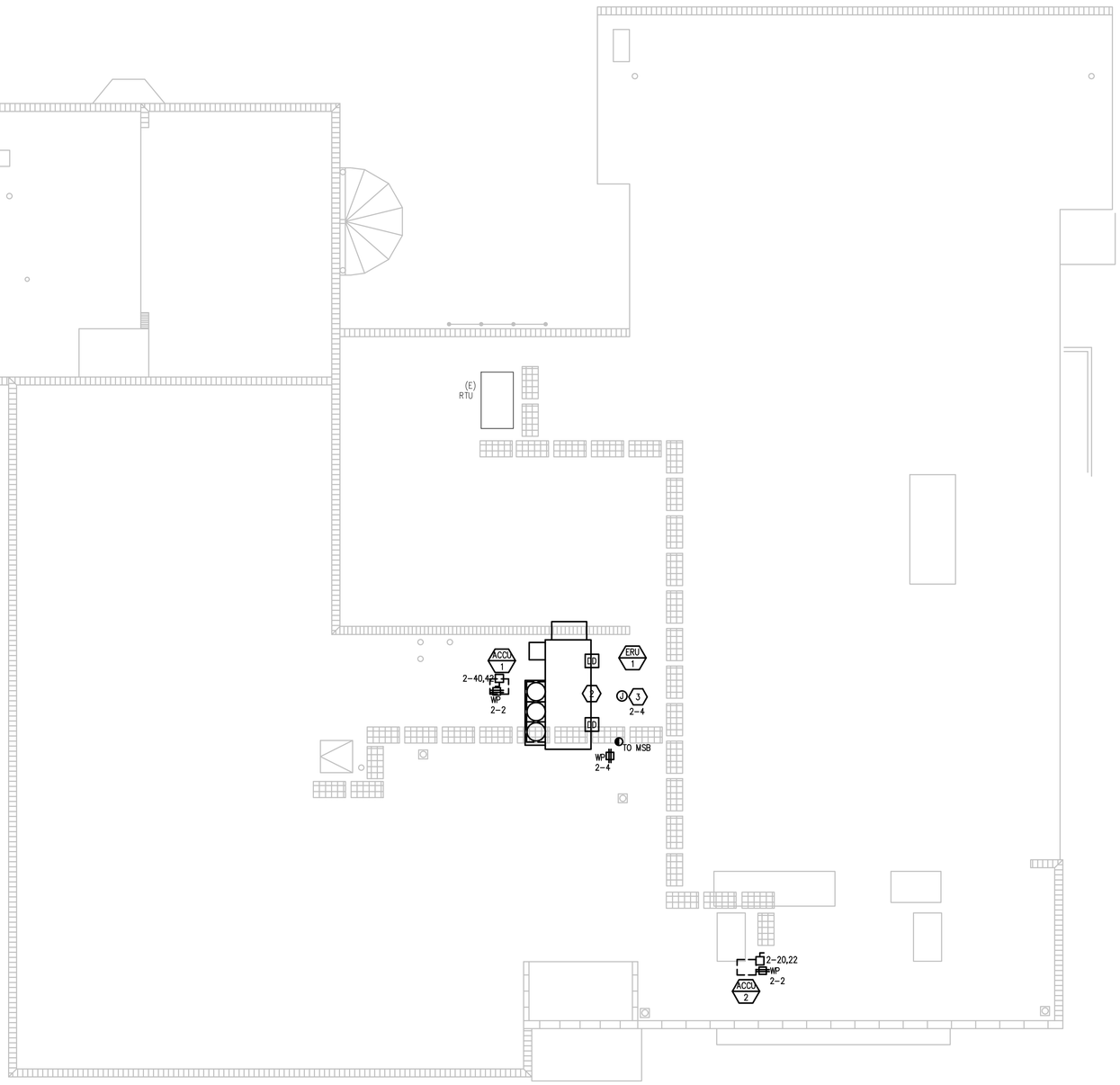
SEB

APPROVED BY
STP

SHEET NAME
UPPER LEVEL POWER PLAN

SHEET NO.
E3-03

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



ROOF ELECTRICAL PLAN
SCALE: 1/8" = 1' - 0"

ELECTRICAL GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
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. 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.
4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
5. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.
7. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
8. ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING FIRE-LITE MS-10UD FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE-TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.

CONSTRUCTION KEY NOTES:

1. REFER TO ONE LINE DIAGRAM ON DRAWING E5-01.
2. DUCT SMOKE DETECTOR SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. COORDINATE MOUNTING LOCATION AND QUANTITY WITH THE MECHANICAL DUCTWORK CONTRACTOR. ELECTRICAL CONTRACTOR SHALL WIRE DUCT SMOKE DETECTOR/RTU SUPPLY/RETURN FAN MOTOR STARTER SO THAT UPON DETECTION OF SMOKE, THE SUPPLY/RETURN FAN WILL SHUT DOWN. THIS SHALL BE ACCOMPLISHED VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WITH THE TEMPERATURE CONTROL/FIRE ALARM CONTRACTOR. PROVIDE WEATHERPROOF ENCLOSURES AS REQUIRED.
3. HEAT TRACE PROVIDED BY OTHERS.

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SHEET NAME
ROOF ELECTRICAL PLAN

SHEET NO.
E4-20

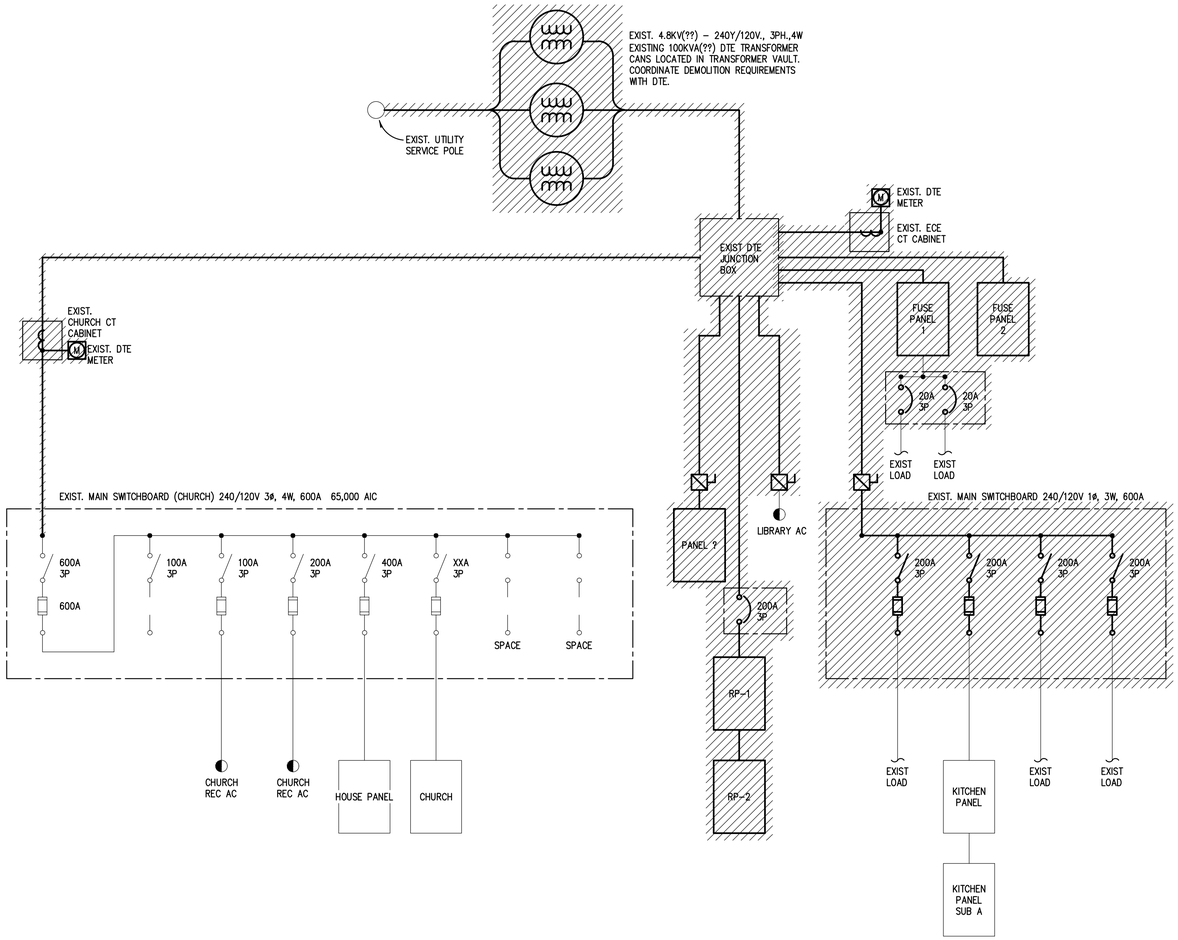

DIAGRAM GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
2. FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE–GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
3. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH THE MOTOR CIRCUIT SIZING SCHEDULES ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
4. BASIS OF DESIGN IS SQUARE D DISTRIBUTION EQUIPMENT. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT FROM OTHER APPROVED MANUFACTURERS, THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THE LAYOUT AND CLEARANCE REQUIREMENTS IN ALL SPACES CONTAINING ELECTRICAL EQUIPMENT AND PROVIDE EQUIPMENT MEETING THE SPECIFICATIONS AND ACHIEVING CODE REQUIRED CLEARANCES WITHIN THE SPACE PROVIDED.
5. VARIABLE FREQUENCY CONTROLLERS (VFC) FURNISHED BY MECHANICAL TRADES. ELECTRICAL CONTRACTOR SHALL INSTALL VFC, PROVIDE POWER FEEDER FROM DISTRIBUTION EQUIPMENT TO VFC AND PROVIDE POWER FEEDER FROM VFC TO MOTOR. REFER TO SPECIFICATIONS FOR APPLICATION OF VFC POWER CABLE FROM VFC TO MOTOR.
6. ELECTRICAL CONTRACTOR TO VERIFY EXISTING TO REMAIN MOTORS ARE DUAL RATED TO ACCOMMODATE NEW ELECTRICAL SERVICE. ELECTRICAL CONTRACTOR TO NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES.

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Bidding - Construction	08/30/2022

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STP

SHEET NAME

ONE LINE DIAGRAM - DEMOLITION

SHEET NO.

E5-01

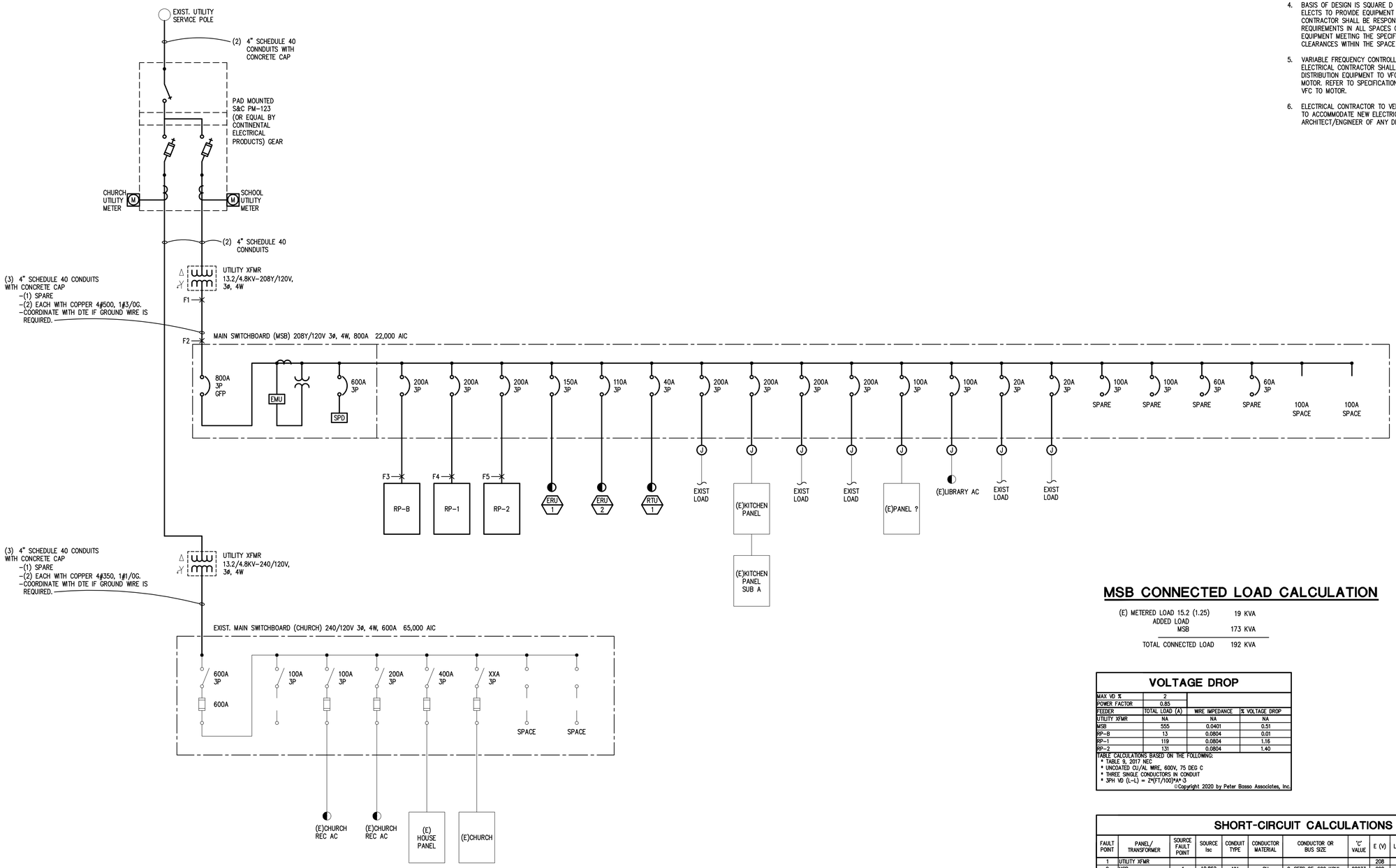

DIAGRAM GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
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6. ELECTRICAL CONTRACTOR TO VERIFY EXISTING TO REMAIN MOTORS ARE DUAL RATED TO ACCOMMODATE NEW ELECTRICAL SERVICE. ELECTRICAL CONTRACTOR TO NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES.

MSB CONNECTED LOAD CALCULATION

(E) METERED LOAD 15.2 (1.25)	19 KVA
ADDED LOAD MSB	173 KVA
TOTAL CONNECTED LOAD	192 KVA

VOLTAGE DROP

MAX VD %	2		
POWER FACTOR	0.85		
FEEDER	TOTAL LOAD (A)	WIRE IMPEDANCE	% VOLTAGE DROP
UTILITY XFMR	NA	NA	NA
MSB	555	0.0401	0.51
RP-B	13	0.0804	0.01
RP-1	119	0.0804	1.16
RP-2	131	0.0804	1.40

TABLE CALCULATIONS BASED ON THE FOLLOWING:
* TABLE 9, 2017 NEC
* UNCOATED CU/AL WIRE, 600V, 75 DEG C
* THREE SINGLE CONDUCTORS IN CONDUIT
* 3PH VD (L-L) = Z*(FT/100)*A*.3

SHORT-CIRCUIT CALCULATIONS

FAULT POINT	PANEL/ TRANSFORMER	SOURCE FAULT POINT	SOURCE Isc	CONDUIT TYPE	CONDUCTOR MATERIAL	CONDUCTOR OR BUS SIZE	"C" VALUE	E (V)	L (FT)	XFMR kVA	XFMR %Z	f	M	Isc
1	UTILITY XFMR							208		225	5.75			10,862
2	MSB	1	10,862	NM	CU	2 SETS OF 600 KCML	28033	208	55.0			0.089	0.92	9,977
3	RP-B	2	9,977	M	CU	1 SET OF 4/0	15082	208	15.0			0.083	0.92	9,215
4	RP-1	3	9,215	M	CU	1 SET OF 4/0	15082	208	146.0			0.743	0.57	5,288
5	RP-2	4	5,288	M	CU	1 SET OF 4/0	15082	208	160.0			0.467	0.68	3,604

THE FOLLOWING THREE PHASE CALCULATIONS ARE BASED ON THE "POINT-BY POINT" METHOD WHERE:

Isc = Isc x M
M = 1/(1+f)

CONDUCTOR OR BUS: $f = \frac{1.732 \times L \times Isc}{C \times n \times E}$

UTILITY XFMR: $Isc = \frac{kVA \times 100,000}{E \times 1.732 \times \%Z}$

XFMR: $f = \frac{Io(sc) \times Eo \times 1.73 \times \%Z}{100,000 \times kVA}$ $Io(sc) = \frac{Eo \times M \times Io(sc)}{Es}$

L = LENGTH (ft) OF CONDUCTOR, C = CONSTANT FROM TABLE, n = NUMBER OF CONDUCTORS PER PHASE
Isc = AVAILABLE SHORT CIRCUIT (A), E = VOLTAGE OF CIRCUIT

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Phase 2
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22-118

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95% Review	06/17/2022
Bidding - Construction	08/30/2022

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SHEET NAME
ONE LINE DIAGRAM - NEW WORK

SHEET NO.
E5-02

PANELBOARD RP-2

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØB	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	EXIST. LOAD		20	180	540			360	20		RECEPTACLE	R	2
3		SPARE		20			380		380	20		RECEPTACLE & HEAT TRACE	R	4
5		SPARE		20						20		SPARE		6
7		SPARE		20		1284			1284	20		AC-4	E	8
9		SPARE		20			1284		1284				E	10
11		SPARE		20				1248	1248	20		ACCU-4	M	12
13		SPARE		20		1248			1248				M	14
15		SPARE		20			1284		1284	15		AC-3	E	16
17		SPARE		20				1284	1284				E	18
19		SPARE		20		1248			1248	20		ACCU-3	M	20
21	R	RECEPTACLE		20	180		1428		1248				M	22
23	M	VUV-10		15	468			2988	2520				M	24
25	M				1440	3960			2520	30		VUV-7	M	26
27	M	ACCU-2		20	1440		3960		2520				M	28
29	M				1440			3960	2520				M	30
31	MH				2520	5040			2520	30		VUV-6	M	32
33	MH	VUV-9		30	2520		5040		2520				M	34
35	MH				2520			2592	72	15		AC-1	M	36
37	M				2520	2592			72				M	38
39	M	VUV-8		30	2520		3580		1060	15		ACCU-1	M	40
41	M				2520			3580	1060				M	42
						15912	16956	15652						
						ØA	ØB	ØC						

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 225A
MAIN TYPE: MLO
MINIMUM A.I.C.: 14,000
MOUNTING: SURFACE

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD | DEMAND FACTOR | CALCULATED LOAD | FEEDER AND OVERCURRENT SIZING
CONTINUOUS LOAD (C) | 100% | | 125% |
ELECTRIC HEAT (E) 5136 | 100% 5136 | 125% 6420 |
NON-CONTINUOUS LOAD (NC) | 100% | | 100% |
KITCHEN LOAD (K) | 100% | | 100% |
RECEPTACLE BASE LOAD (R) 1100 | 100% 1100 | 100% 1100 |
RECEPTACLE DEMAND LOAD (R) | 50% | | 100% |
LIGHTING LOAD (L) | 100% | | 125% |
ADDITIONAL TRACK LIGHTING LOAD
MOTORS, HIGHEST LOAD (MH) 7560 | 125% 9450 | 100% 9450 |
MOTORS, REMAINING LOAD (M) 34724 | 100% 34724 | 100% 34724 |
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD | TOTAL(KVA): 50.41 | |
TOTAL (AMPS): 140 | TOTAL (AMPS): 143

NOTES:
FINAL DIRECTORY TO INCLUDE BUILDING OWNERS ROOM NAMES OR NUMBERS

PANELBOARD RP-1

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØB	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	EXIST. LOAD		20	500	1000			500	20		EXIST. LOAD	R	2
3	R	EXIST. LOAD		20	500		500			20		SPARE		4
5	R	EXIST. LOAD		20	180			180		20		SPARE		6
7		SPARE		20						20		SPARE		8
9		SPARE		20						20		SPARE		10
11		SPARE		20						20		SPARE		12
13		SPARE		20						20		SPARE		14
15		SPARE		20						20		SPARE		16
17		SPARE		20						20		SPARE		18
19		SPARE		20						20		SPARE		20
21		SPARE		20						20		SPARE		22
23		SPARE		20			320	320		20		RECEPTACLE & DUCT DETECTORS	M	24
25		SPARE		20		2520			2520				M	26
27		SPARE		20			2520		2520	30		VUV-3	M	28
29		SPARE		20				2520	2520				M	30
31	MH				2520	5040			2520				M	32
33	MH	VUV-1		30	2520		5040		2520	30		VUV-4	M	34
35	MH				2520			5040	2520				M	36
37	M				2520	5040			2520				M	38
39	M	VUV-2		30	2520		5040		2520	30		VUV-5	M	40
41	M				2520			5040	2520				M	42
						13600	13100	13100						
						ØA	ØB	ØC						

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 225A
MAIN TYPE: MLO
MINIMUM A.I.C.: 14,000
MOUNTING: SURFACE

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD | DEMAND FACTOR | CALCULATED LOAD | FEEDER AND OVERCURRENT SIZING
CONTINUOUS LOAD (C) | 100% | | 125% |
ELECTRIC HEAT (E) | 100% | | 125% |
NON-CONTINUOUS LOAD (NC) | 100% | | 100% |
KITCHEN LOAD (K) | 100% | | 100% |
RECEPTACLE BASE LOAD (R) 1680 | 100% 1680 | 100% 1680 |
RECEPTACLE DEMAND LOAD (R) | 50% | | 100% |
LIGHTING LOAD (L) | 100% | | 125% |
ADDITIONAL TRACK LIGHTING LOAD
MOTORS, HIGHEST LOAD (MH) 7560 | 125% 9450 | 100% 9450 |
MOTORS, REMAINING LOAD (M) 30560 | 100% 30560 | 100% 30560 |
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD | TOTAL(KVA): 41.69 | |
TOTAL (AMPS): 116 | TOTAL (AMPS): 116

NOTES:
FINAL DIRECTORY TO INCLUDE BUILDING OWNERS ROOM NAMES OR NUMBERS

EXIST. PANELBOARD KITCHEN

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1		EXIST. LOAD	EXIST	50					15	EXIST	EXIST. LOAD		2
3									15	EXIST	EXIST. LOAD		4
5		EXIST. LOAD	EXIST	15					20	EXIST	EXIST. LOAD		6
7													8
9		SPARE	EXIST	20					20		SPACE		10
11		SPARE	EXIST	20					20		SPACE		12
13		SPARE	EXIST	20					20		SPACE		14
15		EXIST. LOAD	EXIST	20					60	EXIST	BASEMENT KITCHEN SUB PANEL A		16
17		SPARE	EXIST	20									18
19		SPARE	EXIST	20					20		SPACE		20
21		SPARE	EXIST	20					20	EXIST	EXIST. LOAD		22
23		SPARE	EXIST	20									24
25		EXIST. LOAD	EXIST	20					20	EXIST	SPARE		26
27	M	DUCT DETECTORS	EXIST	20	100		100		20	EXIST	SPARE		28
29		SPARE	EXIST	20					20	EXIST	SPARE		30
31		SPARE	EXIST	20					20	EXIST	EXIST. LOAD		32
33		SPARE	EXIST	20					20	EXIST	EXIST. LOAD		34
35		SPARE	EXIST	20									36
37		SPARE	EXIST	20					20		SPACE		38
39		SPARE	EXIST	20					20		SPACE		40
							100						
						ØA	ØC						

PANELBOARD INFORMATION
VOLTAGE: 120/240-1Ø
BUS AMPACITY: 225A
MAIN TYPE: MLO
MINIMUM A.I.C.:
MOUNTING: FLUSH

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD: | DEMAND FACTOR | CALCULATED LOAD | FEEDER AND OVERCURRENT SIZING
CONTINUOUS LOAD (C): | 100% | | 125% |
ELECTRIC HEAT (E) | 100% | | 125% |
NON-CONTINUOUS LOAD (NC): | 100% | | 100% |
KITCHEN LOAD (K): | 100% | | 100% |
RECEPTACLE BASE LOAD (R): | 100% | | 100% |
RECEPTACLE DEMAND LOAD (R): | 50% | | 100% |
LIGHTING LOAD (L): | 100% | | 125% |
ADDITIONAL TRACK LIGHTING LOAD
MOTORS, HIGHEST LOAD (MH): | 125% | | 100% |
MOTORS, REMAINING LOAD (M): 100 | 100% 100 | 100% 100 |
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD | TOTAL(KVA): 0.10 | |
TOTAL (AMPS): 0 | TOTAL (AMPS): 0

NOTES:
FINAL DIRECTORY TO INCLUDE BUILDING OWNERS ROOM NAMES OR NUMBERS

PANELBOARD RP-B

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØB	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1		SPARE		20		864			864	20		CRU-1	M	2
3		SPARE		20			200		200	15		UH-1	E	4
5		SPARE		20				552	552				MH	6
7		SPARE		20		552			552	15		CP-1	MH	8
9		SPARE		20			552		552				MH	10
11		SPARE		20				552	552				M	12
13		SPARE		20		552			552	15		CP-2	M	14
15		SPARE		20			552		552				M	16
17		SPARE		20						20		SPARE		18
19		SPARE		20						20		SPARE		20
21		SPARE		20						20		SPARE		22
23		SPARE		20						20		SPARE		24
25		SPARE		20						20		SPARE		26
27		SPARE		20						20		SPARE		28
29		SPARE		20						20		SPARE		30
31		SPARE		20						20		SPARE		32
33		SPARE		20						20		SPARE		34
35		SPARE		20						20		SPARE		36
37		SPARE		20						20		SPARE		38
39		SPARE		20						20		SPARE		40
41		SPARE		20						20		SPARE		42
						1968	1304	1104						
						ØA	ØB	ØC						

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 225A
MAIN TYPE: MLO
MINIMUM A.I.C.: 14,000
MOUNTING: SURFACE

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD | DEMAND FACTOR | CALCULATED LOAD | FEEDER AND OVERCURRENT SIZING
CONTINUOUS LOAD (C) | 100% | | 125% |
ELECTRIC HEAT (E) 200 | 100% 200 | 125% 250 |
NON-CONTINUOUS LOAD (NC) | 100% | | 100% |
KITCHEN LOAD (K) | 100% | | 100% |
RECEPTACLE BASE LOAD (R) | 100% | | 100% |
RECEPTACLE DEMAND LOAD (R) | 50% | | 100% |
LIGHTING LOAD (L) | 100% | | 125% |
ADDITIONAL TRACK LIGHTING LOAD | | | 100% |
MOTORS, HIGHEST LOAD (MH) 1656 | 125% 2070 | 100% 2070 |
MOTORS, REMAINING LOAD (M) 2520 | 100% 2520 | 100% 2520 |
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD | TOTAL(KVA): 4.79 | |
TOTAL (AMPS): 13 | TOTAL (AMPS): 13

NOTES:
FINAL DIRECTORY TO INCLUDE BUILDING OWNERS ROOM NAMES OR NUMBERS

PANEL SCHEDULE INDEX

	RP-2	RP-1
	(E) PNL KIT	RP-B

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PBA Project No. 2022.0015

KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 2
Early Childhood

11680 McDougall St
Hamtramck, MI 48212

PROJECT NO.

22-118

ISSUES / REVISIONS

50% Review	05/19/2022
95% Review	06/17/2022
Bidding - Construction	08/30/2022

DRAWN BY
SEB

CHECKED BY
SEB

APPROVED BY
STP

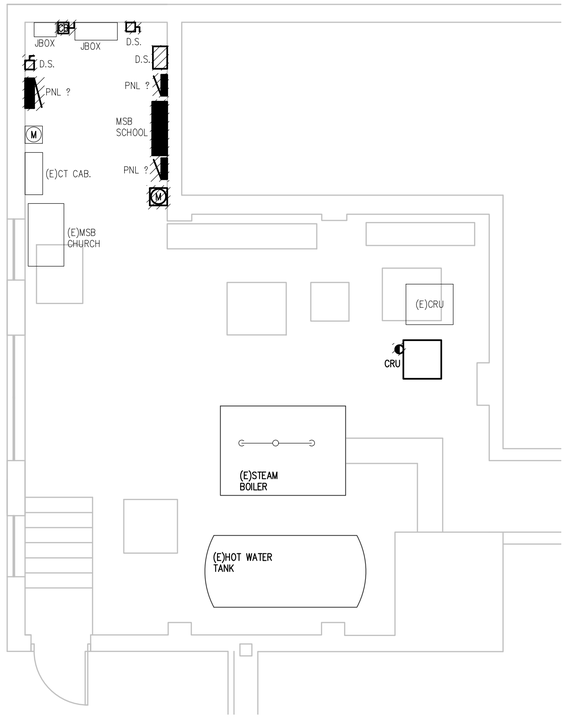
SHEET NAME
PANEL SCHEDULES

SHEET NO.
E5-03

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

ELECTRICAL DEMOLITION GENERAL NOTES:

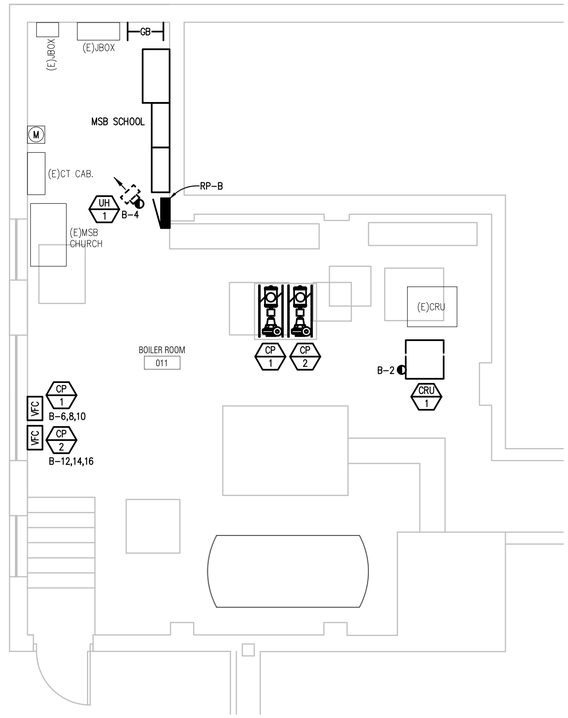
1. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
2. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
3. REMOVE EQUIPMENT OR MATERIALS AS INDICATED ON PLAN WITH CROSS HATCHING. DEMOLITION SHALL INCLUDE, BUT NOT BE LIMITED TO, THOSE COMPONENTS SHOWN.
4. COORDINATE WITH NEW WORK PLANS, ONE LINE DIAGRAMS AND RISER DIAGRAMS FOR EXTENT OF DEMOLITION WORK.
5. PROVIDE PROPER SUPPORT FOR EXISTING TO REMAIN CONDUITS AND BOXES WHERE EXISTING SUPPORT IS TO BE REMOVED. RE-ROUTE BRANCH CIRCUIT CONDUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
6. REMOVE ALL CONDUIT AND WIRE BACK TO THE SOURCE OR NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
7. MAINTAIN ELECTRICAL SERVICE TO ALL LIGHTING FIXTURES, DEVICES AND EQUIPMENT THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM LOADS THAT ARE TO REMAIN.
8. DISPOSE OF ALL MATERIALS OFF SITE AND INCLUDE ALL COSTS FOR DISPOSAL IN BID. ALL MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING TCLP TESTING, PROPER DISPOSAL AND/OR RECYCLING OF FLUORESCENT LAMPS.
9. PROVIDE BLANK COVER PLATES WHERE SWITCHES AND DEVICES ARE REMOVED BUT EXISTING WALLS REMAIN INTACT.
10. RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS "SPARE".
11. PROVIDE UPDATED TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS ALTERATION.
12. VERIFY ALL UNDERGROUND AND IN SLAB UTILITY LOCATIONS PRIOR TO SAW-CUTTING OR PENETRATING ANY FLOOR SLAB.
13. COORDINATE ANY SHUT DOWN OF EXISTING SERVICES AND EQUIPMENT THAT ARE REMAINING IN USE WITH THE OWNER'S REPRESENTATIVE. WHERE EXISTING BUILDING SERVICE IS REQUIRED TO BE SHUT DOWN, INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWNS MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. COORDINATE ELECTRICAL SHUT DOWNS WITH THE OWNER 72 HOURS PRIOR TO SHUT DOWN.



ENLARGED ELECTRICAL BOILER DEMOLITION PLAN
SCALE: 1/4" = 1' - 0"

ELECTRICAL GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
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. 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.
4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
5. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.
7. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
8. ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING FIRE-LITE MS-10UD FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE-TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.



ENLARGED ELECTRICAL BOILER PLAN
SCALE: 1/4" = 1' - 0"

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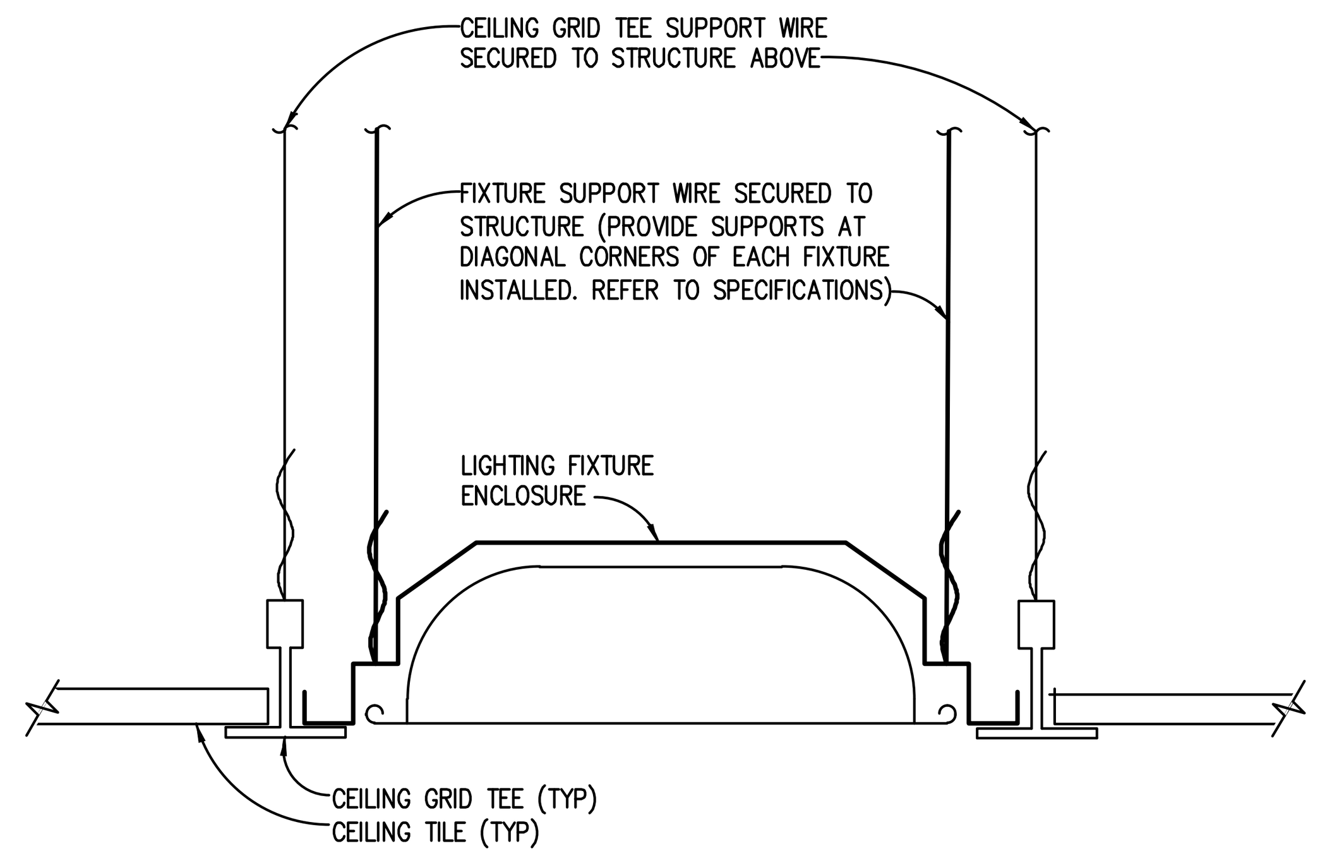
DRAWN BY
SEB

CHECKED BY
SEB

APPROVED BY
STP

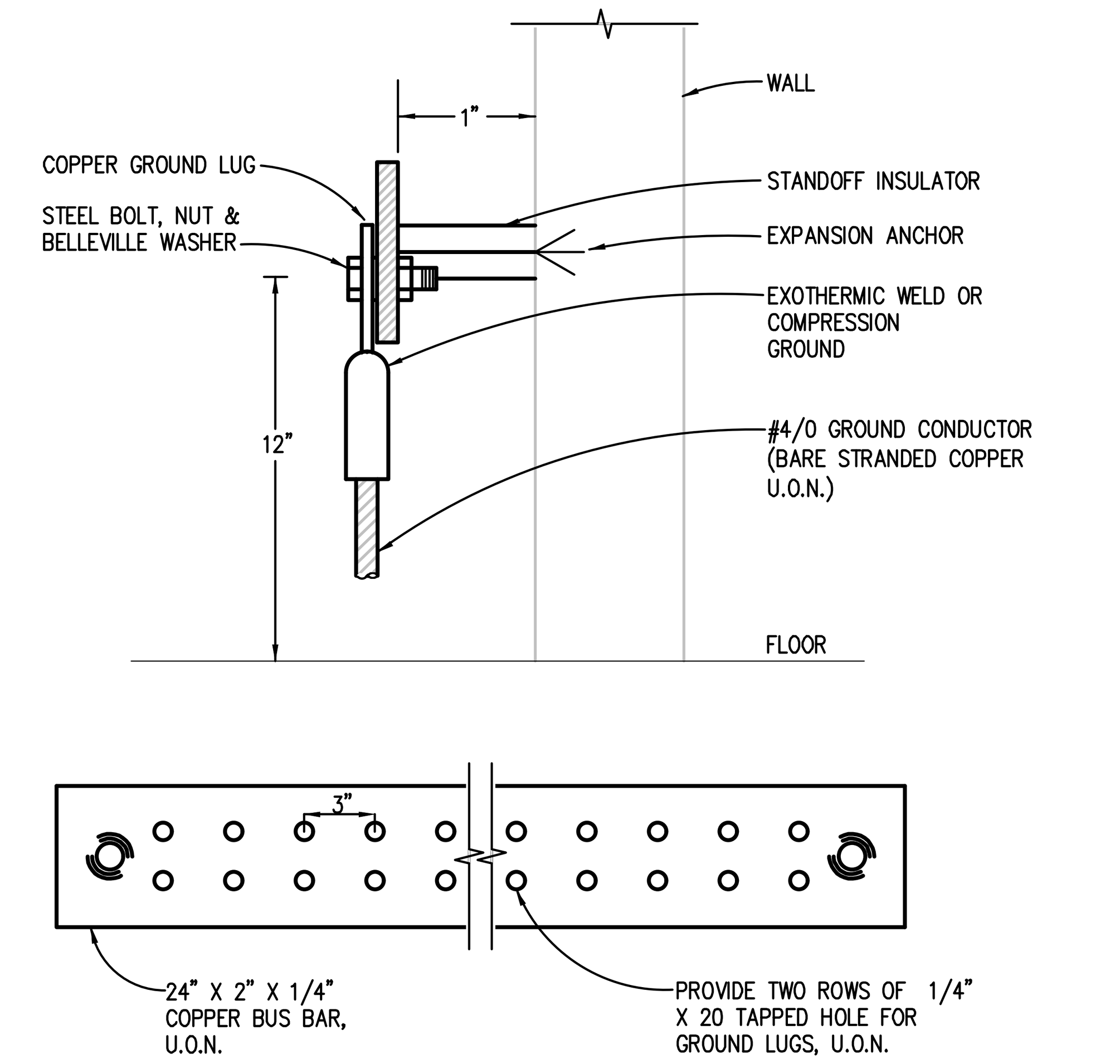
SHEET NAME
ENLARGED ELECTRICAL BOILER DEMOLITION AND NEW WORK PLANS

SHEET NO.
E6-01



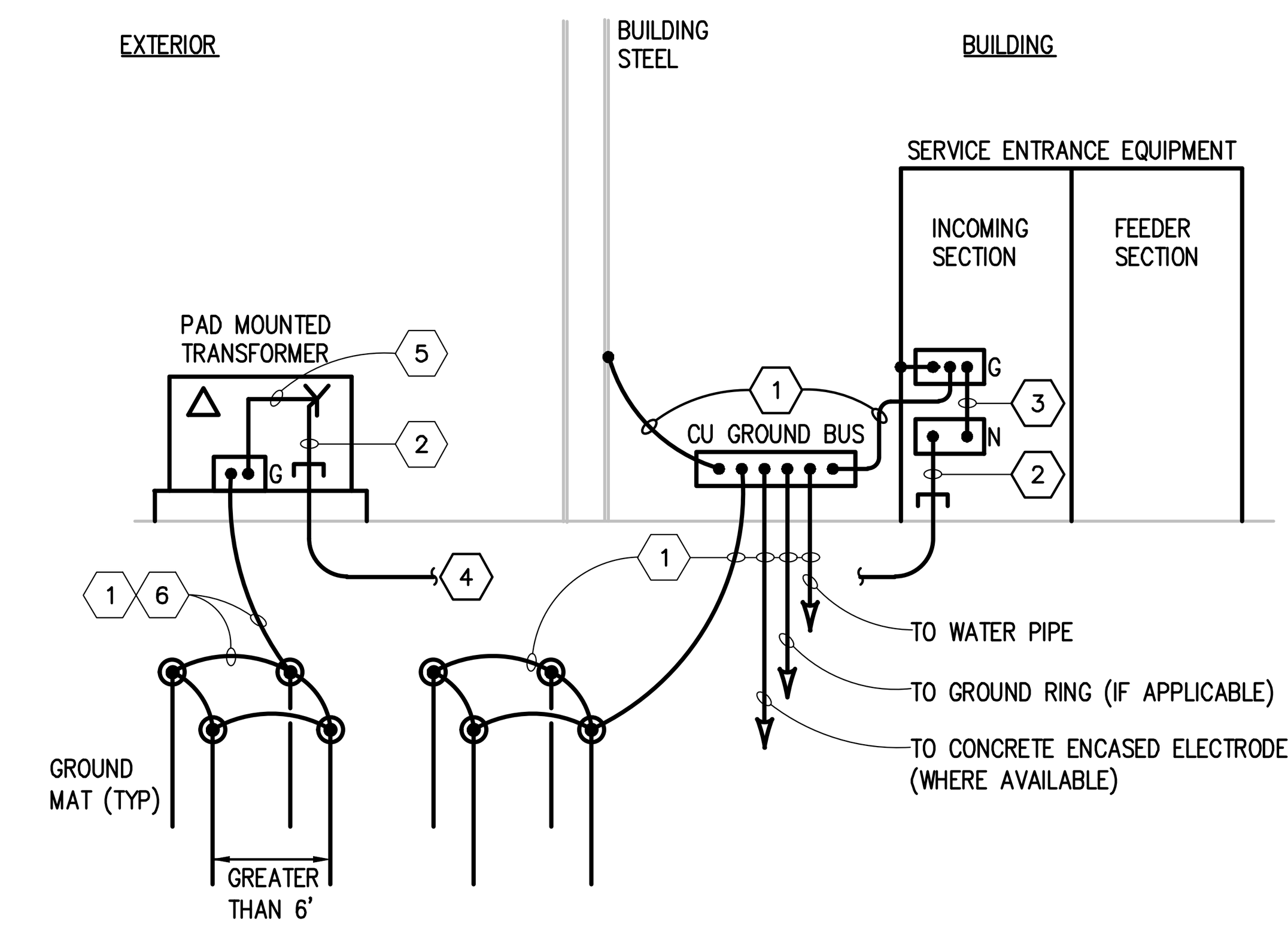
RECESSED LIGHTING FIXTURE INSTALLATION DETAIL

NO SCALE



ELECTRICAL GROUND BUS DETAIL

NO SCALE

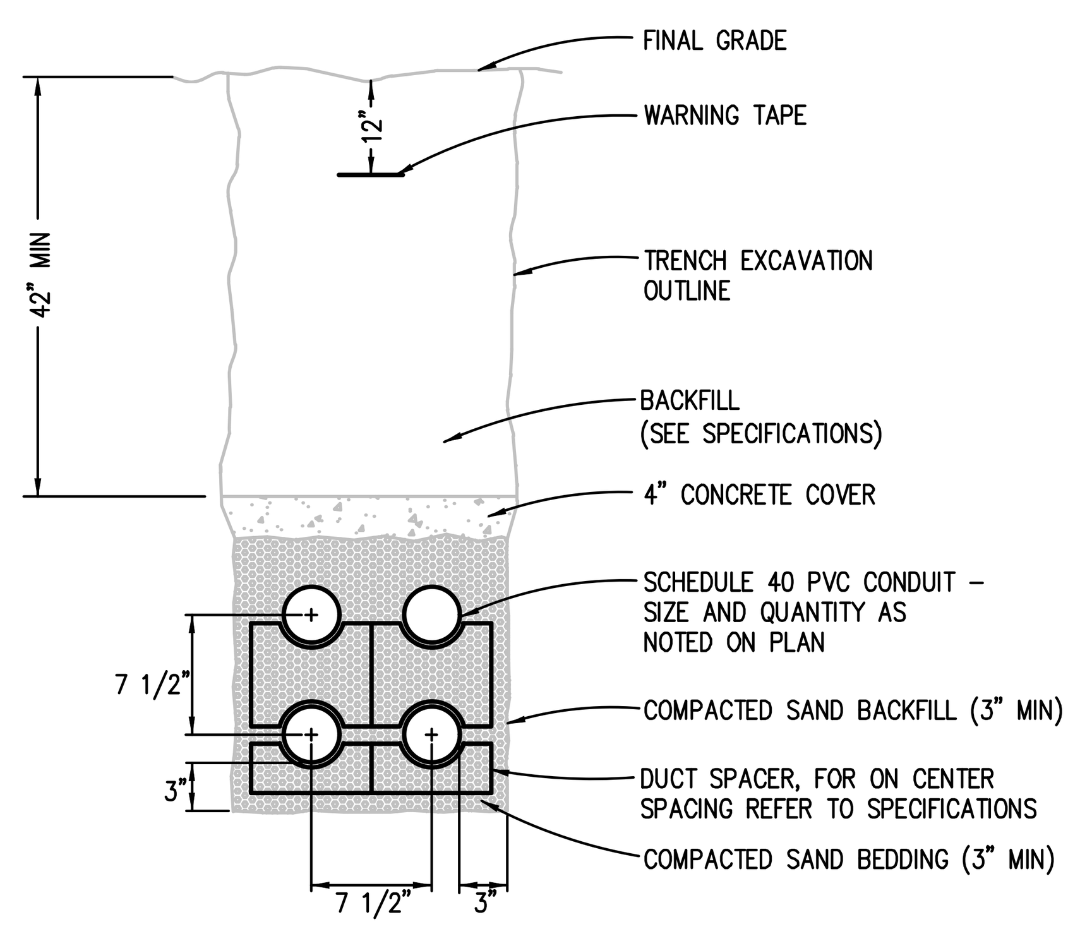


TYPICAL SECONDARY SERVICE ENTRANCE GROUNDING

NO SCALE

 # KEYED NOTES:

1. GROUNDING ELECTRODE CONDUCTOR, #4/0 COPPER.
2. GROUNDED CONDUCTOR (NEUTRAL), SEE ONE LINE DIAGRAM.
3. MAIN BONDING JUMPER, PROVIDED BY MANUFACTURER AS PART OF LISTED EQUIPMENT SIZED PER NEC 250.28 AND 250.102.
4. SERVICE ENTRANCE PHASE CONDUCTORS AND GROUNDED CONDUCTOR IN CONDUIT. SEE ONE LINE DIAGRAM.
5. CONNECTION FROM GROUNDED SERVICE CONDUCTOR TO GROUNDING ELECTRODE AT THE TRANSFORMER PER NEC 250.24. COORDINATE WITH UTILITY.
6. COORDINATE REQUIREMENTS WITH UTILITY COMPANY PRIOR TO INSTALLATION. PROVIDE ALL NECESSARY GROUND RODS AND CONDUCTORS TO MEET UTILITY COMPANY REQUIREMENTS.

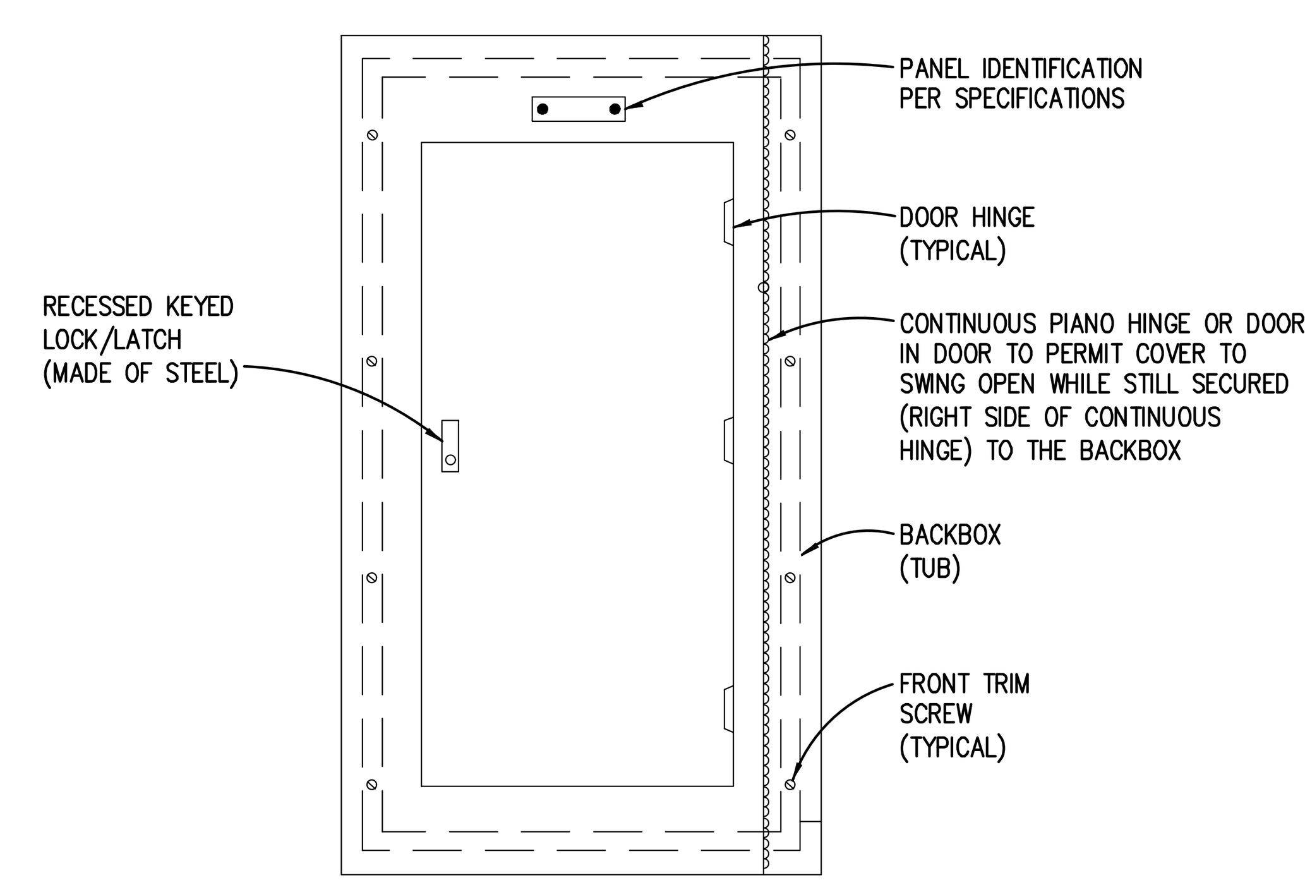


UNDERGROUND CONDUIT DETAIL

NO SCALE

NOTES:

1. QUANTITY AND CONFIGURATION OF DUCTS SHALL BE AS SHOWN ON PLAN DRAWINGS. 12" MINIMUM SEPARATION SHALL BE MAINTAINED BETWEEN ELECTRICAL AND COMMUNICATIONS DUCTS.



PANELBOARD FRONT COVER DETAIL

NO SCALE

SYSTEM OUTPUTS — ANNUNCIATION

SYSTEM INPUTS — INITIATION	INITIATE FIRE ALARM SIGNAL	INITIATE CARBON MONOXIDE ALARM SIGNAL	IDENTIFY ALARM AT FACP	IDENTIFY ALARM AT REMOTE ANNUNCIATOR(S)	ANNUNCIATE SUPERVISORY SIGNAL AT FACP	ANNUNCIATE SUPERVISORY SIGNAL AT REMOTE ANNUNCIATOR(S)	ANNUNCIATE TROUBLE SIGNAL AT FACP	ANNUNCIATE TROUBLE SIGNAL AT REMOTE ANNUNCIATOR(S)	RING TROUBLE BELL (WHEN PROVIDED)	ACTUATE ALARM SEQUENCE ON EXISTING FACP	ACTIVATE ELEVATOR LOBBY "FLASH HAT" WARNING	ACTIVATE IN ELEVATOR IN-CAR WARNING SIGNAL	DISPLAY ELEVATOR RECALL STATUS AT ANNUNCIATOR	DISPLAY ELEVATOR STATUS AT FACP IN FIRE COMMAND CENTER
CARBON MONOXIDE DETECTOR OPERATION		●								●				
DUCT DETECTOR OPERATION	●		●	●						●				

SYSTEM OUTPUTS — NOTIFICATION

SYSTEM INPUTS — INITIATION	OPERATE ALARM NOTIFICATION APPLIANCES CONTINUOUSLY	ACTIVATE VOICE/ALARM COMMUNICATION SYSTEM	TRANSMIT ALARM SIGNAL TO REMOTE ALARM RECEIVING STATION	TRANSMIT SUPERVISORY SIGNAL TO REMOTE ALARM RECEIVING STATION	TRANSMIT TROUBLE SIGNAL TO REMOTE ALARM RECEIVING STATION	TRANSMIT ALARM SIGNAL TO BUILDING AUTOMATION SYSTEM	TRANSMIT TROUBLE SIGNAL TO BUILDING AUTOMATION SYSTEM	RECORD EVENTS IN THE SYSTEM MEMORY	RECORD EVENTS BY THE SYSTEM PRINTER	DISPLAY STATUS ON SMOKE CONTROL PANEL
CARBON MONOXIDE DETECTOR OPERATION	●	●	●			●				
DUCT DETECTOR OPERATION	●	●	●			●				

SYSTEM OUTPUTS — FIRE SAFETY

SYSTEM INPUTS — INITIATION	UNLOCK ELECTRIC DOOR LOCKS IN DESIGNATED EGRESS PATHS	DISABLE SOUND MASKING, PAGING, OR AUDIO SYSTEMS	RELEASE FIRE AND SMOKE DOORS	TURN ON EGRESS LIGHTING TO FULL BRIGHTNESS	DISABLE AUTOMATIC DOORS	OPEN AUTOMATIC SMOKE EXHAUST DOORS AND MAKE-UP DAMPERS	ACTUATE SMOKE EXHAUST SYSTEM (5 SECOND DELAY)	PRESSURIZE STAIRWELLS	SHUTDOWN HVAC UNIT SERVING ZONE IN ALARM VIA CONTROL MODULE (INTERLOCK)	SWITCH HVAC EQUIPMENT CONTROLS TO FIRE ALARM MODE	CLOSE SMOKE DAMPERS IN AIR DUCT SYSTEM SERVING ZONE WHERE ALARM WAS INITIATED	RECALL ELEVATOR TO DESIGNATED RECALL LEVEL	RECALL ELEVATOR TO ALTERNATE RECALL LEVEL	ILLUMINATE HOISTWAY LIGHTING
CARBON MONOXIDE DETECTOR OPERATION	●	●	●	●										
DUCT DETECTOR OPERATION	●	●	●	●				●	●	●	●			

FIRE ALARM MATRIX

NO SCALE

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95% Review	06/17/2022
Bidding - Construction	08/30/2022

DRAWN BY: SEB

CHECKED BY: SEB

APPROVED BY: STP

SHEET NAME: ELECTRICAL DETAILS AND DIAGRAMS

SHEET NO.: E7-01