HPS HVAC Improvements - Phase 1

Horizon High School

3225 Caniff, Hamtramck, MI 48212

PARTNERS

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List of Drawings

Sheet Number	Sheet Title
A0-00	Cover Sheet
Architectural	
A0-01	General Project Information
A3-01	Composite Floor Plans
A3-20	Roof Plan & Details
Structural	
S3-20	Roof Framing Plan
Mechanical	
M0-01	Mechanical Standards And Drawing Index
MD1-10	Mechanical Demolition Plans
MD1-20	Roof Mechanical Demolition Plan
M3-10	Mechanical Plans
M3-20	Roof Mechanical Plans
M6-01	Mechanical Details
M7-01	Mechanical Schedules
M7-02	Mechanical Schedules
M8-01	Temperature Control Standards And General Notes
Electrical	
E0-01	Electrical Standards And Drawing Index
E0-02	Electrical Standard Schedule
ED3-20	Electrical Demolition Plans
E3-20	Electrical Plans
E5-01	One Line Diagram

PARTNERS

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LOCATION MAP

NORTH

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Horizon High School

3225 Caniff
Hamtramck, MI 48212

PROJECT NO.

22-106C

ISSUES / REVISIONS

Owner Review	03/22/2022
Bidding - Construction	04/07/2022

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ACS

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
K	KIPS
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
TOIL	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

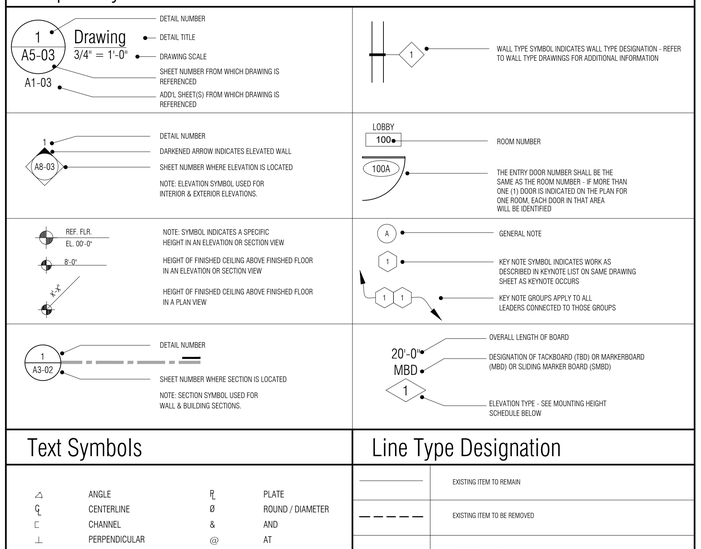
W

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



Text Symbols

∠	ANGLE	P_L	PLATE
$\mathbb{C}_L$	CENTERLINE	Ø	ROUND / DIAMETER
⊏	CHANNEL	&	AND
⊥	PERPENDICULAR	@	AT

Line Type Designation

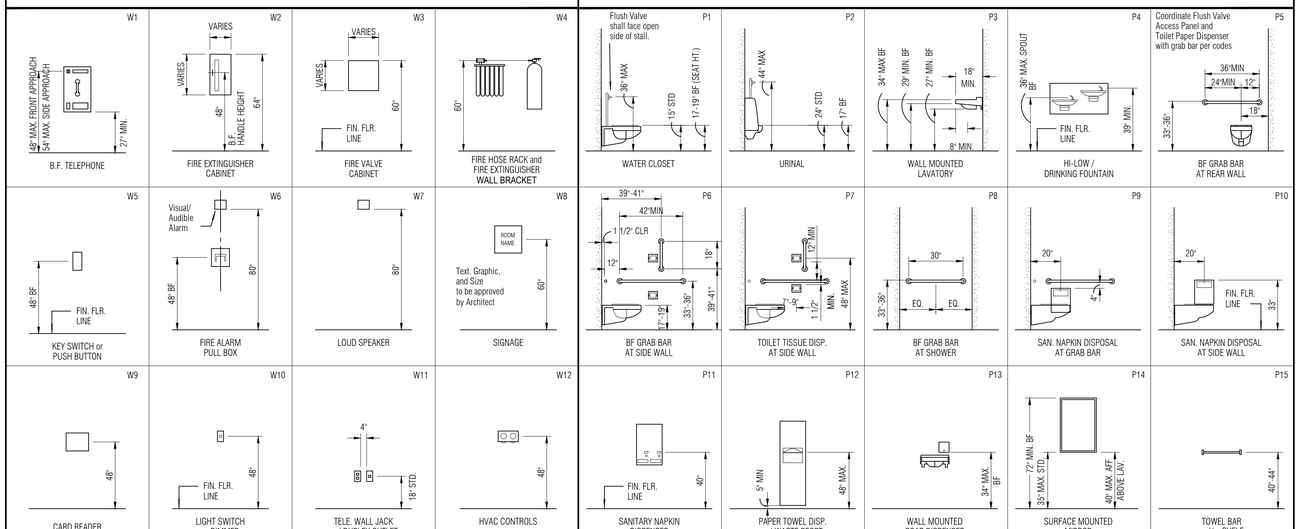
———	EXISTING ITEM TO REMAIN
- - - -	EXISTING ITEM TO BE REMOVED
———	NEW ITEM AS NOTED

Material Poche Indications

CONCRETE (SECTION)	GYPSUM WALL BOARD	WOOD/SOLID SPECIES (FINISH MATERIAL) (NOTE MATERIAL)
CONC., STONE, PLASTER (ELEVATION) (NOTE MATERIAL)	PLASTER GYPSUM/ CEMENTITIOUS ON METAL LATH (NOTE MATERIAL)	WOOD (CONTINUOUS BOCKING)
STONE (MARBLE, STONE) (GRANITE, ETC.) (SECTION/ELEVATION) (NOTE MATERIAL)	INSULATION ACOUSTIC/THERMAL (NOTE TYPE) RIGID /SEMI-RIGID	SHIM MATERIAL (WOOD, METAL, ETC.) (NOTE MATERIAL)
GRAVEL/STONE (GRANULAR MATERIAL)	JOINT FILLER	PLYWOOD / PARTICLE BOARD (VENEER FINISH) (NOTE MATERIAL)
SAND/GRAVEL (SUB-BASE MATERIAL)	C.M.U. / MASONRY BLOCK (CONCRETE BLOCK) SOLID BLOCK BLOCK GROUTED SOLID	CARPET
BRICK	INSULATION ACOUSTIC/THERMAL (NOTE TYPE) BATT OR BLANKET	
STEEL/COPPER, METAL, ALUMINUM, ETC. (NOTE MATERIAL)		

Mounting Height Schedule

WALL MOUNTED ACCESSORIES



PLUMBING FIXTURES and TOILET ACCESSORIES

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

PARTNERS

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CONSULTANT

KEY PLAN

OWNER

Hamtramck Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Horizon High School

3225 Caniff
Hamtramck, MI 48212

PROJECT NO.

22-106C

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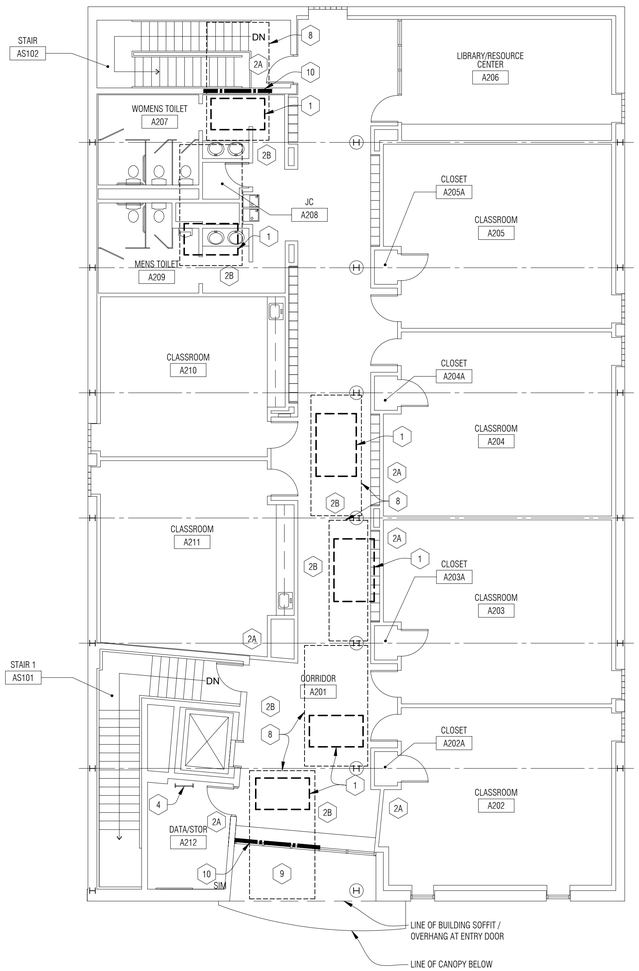
SHEET NAME

GENERAL INFORMATION

SHEET NO.

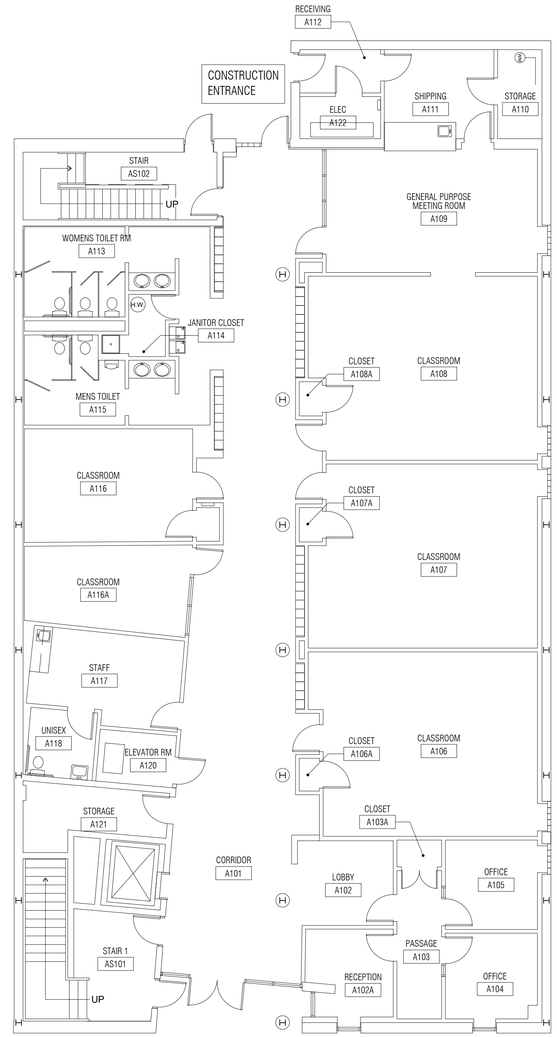
A0-01



N

2 Composite Second Floor Plan

1/8" = 1'-0"



N

1 Composite First Floor Plan

1/8" = 1'-0"

BUILDING CODE INFORMATION

OWNER: HAMTRAMCK PUBLIC SCHOOLS

PROJECT: HVAC IMPROVEMENTS

ADDRESS: 3225 CANIFF, HAMTRAMCK MICHIGAN 48212

GOVERNING CODES:

2015 MICHIGAN BUILDING CODE (MBC)
2012 NFPA LIFE SAFETY CODE 101 (LSC)
- - CHAPTERS 1 TO 11, 15, 26,27,32 & 33 (WITH AMENDMENTS)
2015 MICHIGAN ENERGY CODE INCOPERATING ANSI/ASHRAE/IESNA STANDARD 90.1
2015 MICHIGAN MECHANICAL CODE (MMC)
2017 NATIONAL ELECTRICAL CODE (NEC)
2018 MICHIGAN PLUMBING CODE (MPC)

BUILDING DATA SUMMARY:

- OCCUPANCY: (E) EDUCATIONAL
- CONSTRUCTION TYPE: TYPE IIIB (UNPROTECTED, COMBUSTIBLE)
- SUPPRESSION: EXISTING SPRINKLERED
- BUILDING AREA: UNCHANGED
- BUILDING HEIGHT: UNCHANGED

NEW WORK KEY NOTES (NOT ALL KEYNOTES ARE APPLICABLE):

1. APPROXIMATE LOCATION OF ROOF TOP UNIT (V.I.F.).
2A. APPROXIMATE AREA FOR CEILING ACCESS TO MECH EQUIPMENT AND/OR STRUCTURAL STEEL REINFORCING - REFER TO MECH AND/OR STRUCTURAL DRAWINGS - LAY-IN CEILING TILE: REMOVE AND REPLACE TILE AND/OR GRID AS NEEDED FOR ACCESS.
2B. APPROXIMATE AREA FOR CEILING ACCESS TO MECH EQUIPMENT AND/OR STRUCTURAL STEEL REINFORCING - REFER TO MECH AND/OR STRUCTURAL DRAWINGS - HARD SURFACE CEILING: REVIEW ADJACENT AREAS PRIOR TO ACCESSING AREA THROUGH HARD SURFACE CEILING TO DETERMINE IF OTHER ACCESS IS AVAILABLE. IF ACCESS MUST BE FROM HARD SURFACE CEILING AREA, REMOVE PORTION OF EXISTING CEILING AS NEEDED FOR ACCESS - PATCH AND REPAIR ALL AFFECTED AREAS, PAINT TO MATCH EXISTING SURFACES.
3. APPROXIMATE LOCATION OF CONDENSING UNITS ON ROOF - PIPING ACCESSIBLE FROM GYMNASIUM (METAL DECK ON STEEL JOISTS) AT APPROXIMATELY 25'-0" FROM AUX GYM FF.
4. ROOF ACCESS.
5. APPROXIMATE LOCATION OF STEEL TABLE ON ROOF - REFER TO STRUCTURAL FOR STEEL REINFORCING - LAY-IN CEILING AT APPROXIMATELY 25'-0" FROM GYM FF.
6. APPROXIMATE SIZE AND LOCATION OF EXISTING CAP AND ROOF CURB TO BE MODIFIED AND NEW CURB CAP INSTALLED BELOW STL SUPPORTS (V.I.F.).
7. APPROXIMATE AREA FOR NEW DUCT PENETRATION THROUGH CURB CAP. PROVIDE DUCT PENETRATION FLASHING - COORDINATE W/ MECH FOR LAYOUT AND SIZE.
8. APPROXIMATE AREA OF FINISH CEILING REMOVAL AND REINSTALLATION / REPLACEMENT FOR ROOF STRUCTURAL REINFORCEMENT - REFER TO STRUCT.
9. APPROXIMATE AREA OF ROOF STRUCTURAL REINFORCEMENT WITHIN OVERHANG CONSTRUCTION - VERIFY INTERIOR ACCESS TO OVERHANG. REMOVE AND REPLACE EXTERIOR SOFFIT AS REQD TO COMPLETE REINFORCEMENT WORK - VERIFY SOFFIT MATERIAL AND CONSTRUCTION IN FIELD - REFER TO STRUCT.
10. APPROXIMATE LOCATION OF RATED WALL PENETRATION FOR NEW JOIST REINFORCEMENT. REMOVE AND RECONSTRUCT RATED WALL CONSTRUCTION TO COMPLETE REINFORCEMENT WORK - REFER TO STRUCT - SEAL WALL CONSTRUCTION SMOKE TIGHT AT MODIFIED CONSTRUCTION.
11. EXISTING DAMPER / ACTUATOR REMOVAL / REPLACEMENT BY MECH - TOUCH UP PAINT / PAINT NEW EXPOSED COMPONENT TO MATCH EXISTING CEILING COLOR - MATCH IN FIELD.
12. NEW HVAC UNIT CONTROLS INSTALLATION BY MECH - TOUCH UP PAINT AT CONTROL INSTALLATION AND/OR EXPOSED CONDUIT ALTERATIONS.
13. TOUCH UP / PAINT NEW EXPOSED CONDUIT TO MATCH EXISTING EXPOSED ROOF DECK COLOR - REFER TO ELEC.

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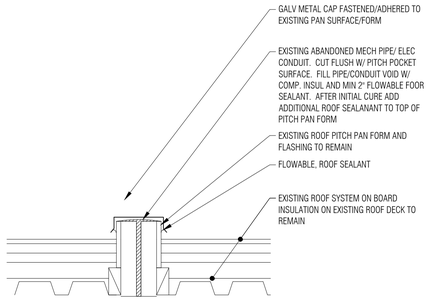
MAM

SHEET NAME

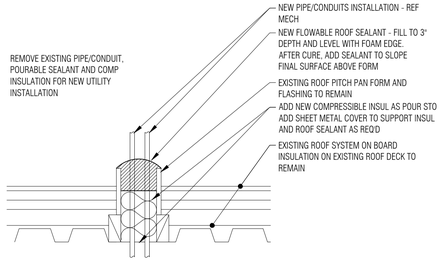
COMPOSITE
FLOOR PLANS

SHEET NO.

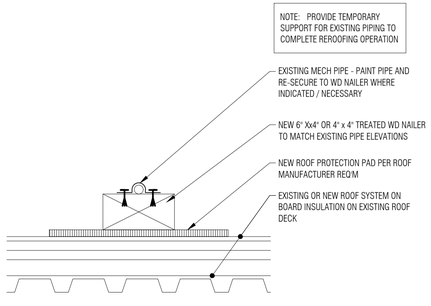
A3-01



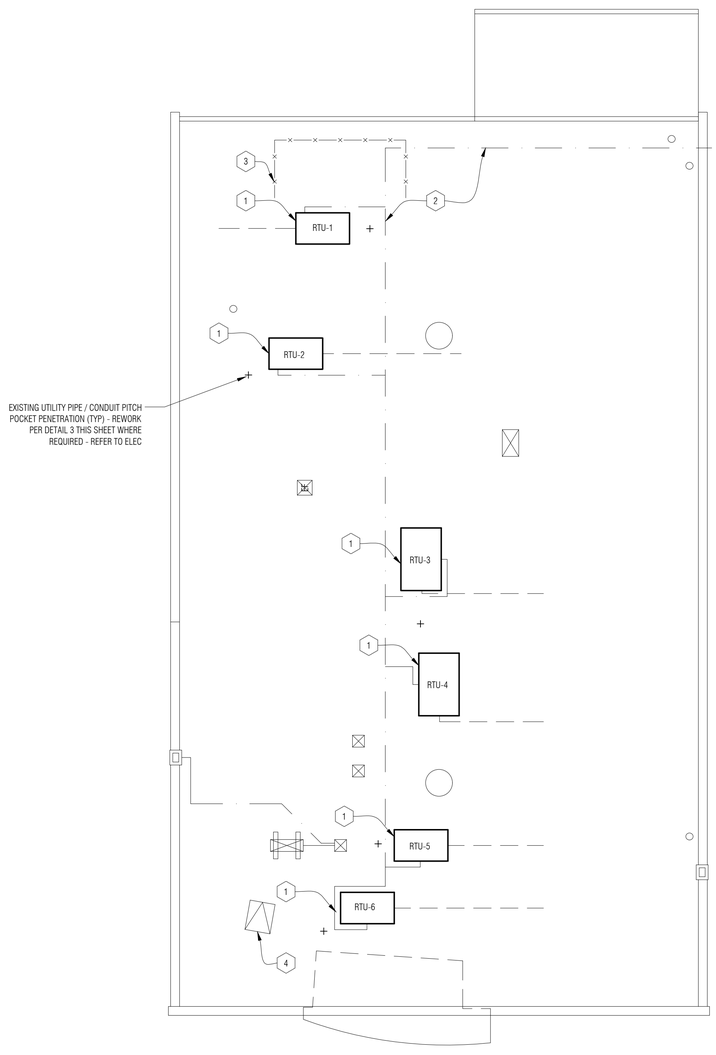
4 Typical Abandoned Pipe/Conduit Penetration Patch
N.T.S.



3 Existing Pitch Pan Utility Penetration Reuse Dtl
N.T.S.



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



N 1 Roof Plan
1/8" = 1'-0"

ROOF NEW WORK 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. ALL ROOFING MODIFICATIONS SHALL BE INSPECTED BY A MANUFACTURERS CERTIFIED INSPECTOR AND DOCUMENTATION PROVIDED CONFIRMING ALL WORK/MODIFICATIONS HAVE BEEN PER MANUFACTURER REQUIREMENTS AND FULL SYSTEM WARRANTY REMAINS IN EFFECT.

E. ANY DEFICIENCIES NOTED BY INSPECTOR OR REVIEW AUTHORITIES SHALL BE PROMPTLY REPAIRED/REPLACED TO SATISFY INSPECTORS NOTED DEFICIENCIES AND RESTORE FULL ROOF SYSTEM WARRANTY.

F. NEW OR EXISTING MECH EQUIPMENT AND UTILITY MODIFICATIONS TO BE BY MECH/ELEC TRADES U.O.N.

G. NEW ROOF OPENING AND/OR MODIFICATIONS TO EXISTING ROOF OPENINGS INCLUDING DEMO/INFILL OF STRUCTURAL DECK W/ ASSOCIATED STEEL SUPPORTS TO BE BY MECH/ELEC/STRUCTURAL TRADES U.O.N.

H. PROTECT EXISTING ROOF MEMBRANE DURING CONSTRUCTION

ROOF NEW WORK KEY NOTES:

1 EXISTING CURB TO REMAIN - NEW MECH UNIT TO BE PLACED ON CURB ADAPTER - REFER MECH. CURB ADAPTOR TO BE OF FULLY WELDED CONSTRUCTION

2 EXISTING GAS PIPING OVER ROOF TO REMAIN W/ BRANCH SERVICE PIPING ALTERATION TO RTU - REFER TO MECH.

3 EXISTING MOBIL GUARD RAIL SYSTEM - REMOVE AND RESET AS REQ'D TO COMPLETE WORK.

4 ROOF ACCESS HATCH.

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KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Horizon High School

3225 Caniff
Hamtramck, MI 48212

PROJECT NO.

22-106C

ISSUES / REVISIONS

Owner Review	03/22/2022
Bidding - Construction	04/07/2022

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MAM

SHEET NAME

ROOF PLAN & DETAILS

SHEET NO.
A3-20

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 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.

WOOD

1. WOOD CONSTRUCTION SHALL BE PER AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (AITC) STANDARDS AND SPECIFICATIONS, AND NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (NDS) AS PUBLISHED BY NATIONAL FOREST PRODUCTS ASSOCIATION.

2. ALL LUMBER FRAMING MEMBERS ARE TO HAVE THE FOLLOWING MINIMUM BASE DESIGN VALUES IN ACCORDANCE WITH THE LATEST ISSUE OF THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (NDS) AS PUBLISHED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION (NFPA):

   Fb = 850 P.S.I.
   fv = 135 P.S.I.
   E = 1,300,000 P.S.I.
   NO. 2 OR BETTER

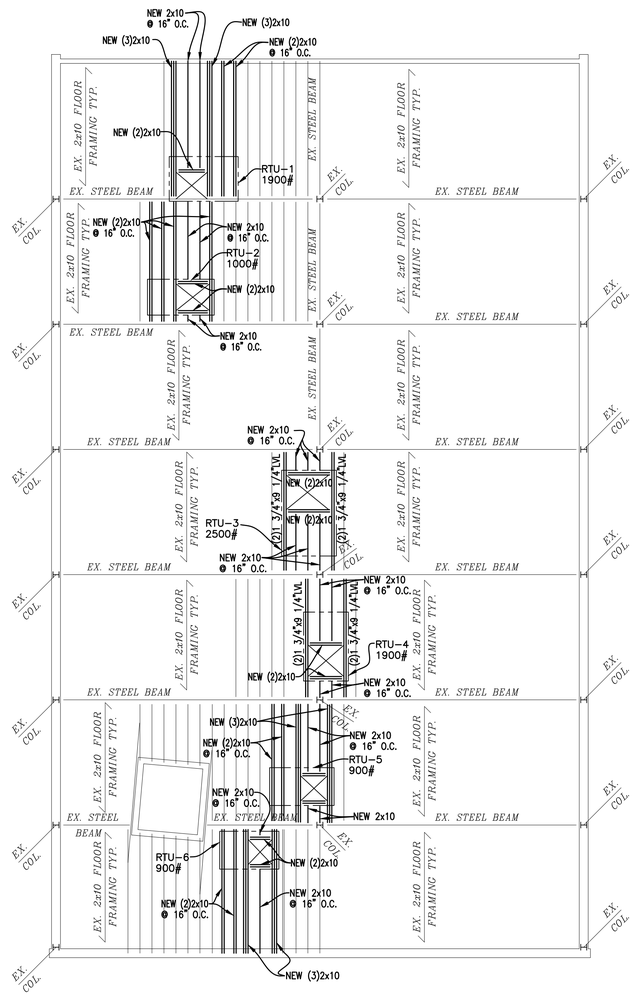
3. PLYWOOD TO BE CONTINUOUS OVER TWO (2) OR MORE SPANS AND FACE GRAIN PERPENDICULAR TO SUPPORT.

4. PLYWOOD OR ORIENTED STRAND BOARD FOR ROOF: 5/8" (32/16) 5 PLY STANDARD GRADE. PROVIDE ROOF CLIPS TYPICAL AT SHEATHING EDGES BETWEEN TRUSSES. STAGGER PLYWOOD JOINTS BETWEEN ROWS OF SHEATHING (OFFSET 4'-0" EACH ROW).

5. HANGERS, STRAPS, CLIPS AND HOLDOWNS SHALL BE MANUFACTURED BY THE "SIMPSON MANUFACTURING COMPANY". ALL EXTERIOR CONNECTIONS ARE TO BE GALVANIZED.

6. ALL STRUCTURAL LAMINATED VENEER LUMBER TO HAVE THE FOLLOWING MINIMUM DESIGN PROPERTIES BASED ON AITC GRADING STANDARDS:

   Fb = 2800 PSI
   Fv = 285 PSI
   $Fc_{\perp}$ = 750 PSI
   E = 2,000,000 PSI



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

TYPICAL ROOF SHEATHING IN-FILL IS 5/8" PLYWOOD. STAGGER PLYWOOD JOISTS BETWEEN ROWS OF SHEATHING (OFFSET 4'-0" EACH ROW) ATTACH WITH 8d NAILS 6'-0" O.C. AT EDGES AND 12" O.C. IN FIELD.

NOTE: BECAUSE THE EXISTING FRAMING IS UNKNOWN, NEW FRAMING IS SHOWN AT ALL REPLACEMENT RTU'S. DURING CONSTRUCTION WHEN THE EXISTING FRAMING IS EXPOSED IT CAN BE EVALUATED TO DETERMINE IF ANY OF THE EXISTING FRAMING IS SUITABLE FOR RE-USE.

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KEY PLAN

OWNER

Hamtramck Public Schools

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SHEET NAME

ROOF FRAMING PLAN

SHEET NO.
S3-20

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
	ABOVE COUNTER DUPLEX RECEPTACLE (SIMILAR FOR TAMPER RESISTANT, QUADS, EMERGENCY, USB AND GFCI RECEPTACLES)
	DUPLEX RECEPTACLE–GROUND FAULT CIRCUIT INTERRUPTER
	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
	DUPLEX UPS RECEPTACLE
	DUPLEX RECEPTACLE WITH 2 USB PORTS OUTLET
	4 PORT USB CHARGING STATION
	CEILING MOUNTED DUPLEX/QUAD RECEPTACLE
	POWER POLE
	WALL/CEILING MOUNTED SPECIAL RECEPTACLE – REFER TO ELECTRICAL STANDARD SCHEDULES
IC	INTERCOM OUTLET
S	SPEAKER
	SPEAKER – WALL MOUNTED
MIC	MICROPHONE
VC	VOLUME CONTROL/STATION SELECTOR
B	SIGNALING BELL
	SINGLE FACE CLOCK – CEILING MOUNTED
	SINGLE FACE CLOCK – WALL MOUNTED
	DOUBLE FACE CLOCK – CEILING MOUNTED
	DOUBLE FACE COMBINATION CLOCK/SPEAKER CEILING MOUNTED
	DOUBLE FACE CLOCK – WALL MOUNTED
	DOUBLE FACE COMBINATION CLOCK/SPEAKER WALL MOUNTED
T/C	TIME CLOCK
C	CONTACTOR
P	PHOTOCELL
TT	TWIST TIMER

SYMBOL	DESCRIPTION
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
"X"	MULTI–SERVICE DROP SEE ELECTRICAL DETAILS AND DIAGRAMS SHEET "X" INDICATES TYPE
	MULTI–OUTLET SURFACE RACEWAY

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
J	JUNCTION BOX
	HARD WIRE POWER CONNECTION
	GROUND ROD
	GROUND CONNECTION
HH	HANDHOLE
	CONDUIT SLEEVE WITH BUSHINGS LENGTH AS REQUIRED "X" INDICATES CONDUIT SIZE
	CONDUIT UP
	CONDUIT DOWN
	EMPTY BOX FOR FUTURE TELECOMMUNICATION OUTLET
	ABOVE COUNTER EMPTY BOX FOR FUTURE TELECOMMUNICATION OUTLET
	EMPTY BOX FOR FUTURE CEILING MOUNTED TELECOMMUNICATION OUTLET
	TELECOMMUNICATION OUTLET "X" INDICATES TYPE
	ABOVE COUNTER TELECOMMUNICATION OUTLET "X" INDICATES TYPE
	TELECOMMUNICATION CEILING MOUNTED OUTLET "X" INDICATES TYPE
	TELECOMMUNICATION BACKBOARD
TGB	TELECOMMUNICATION GROUNDING BUS BAR
TMGB	TELECOMMUNICATION MAIN GROUNDING BUS BAR

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
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

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
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

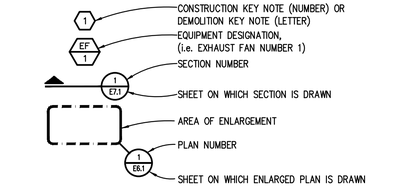
SHEET NO.	SHEET TITLE
E0–01	ELECTRICAL STANDARDS AND DRAWING INDEX
E0–02	ELECTRICAL STANDARD SCHEDULES
ED3–20	ELECTRICAL DEMOLITION PLANS
E3–20	ELECTRICAL PLANS
E5–01	ONE LINE DIAGRAM

ELECTRICAL ABBREVIATION LIST

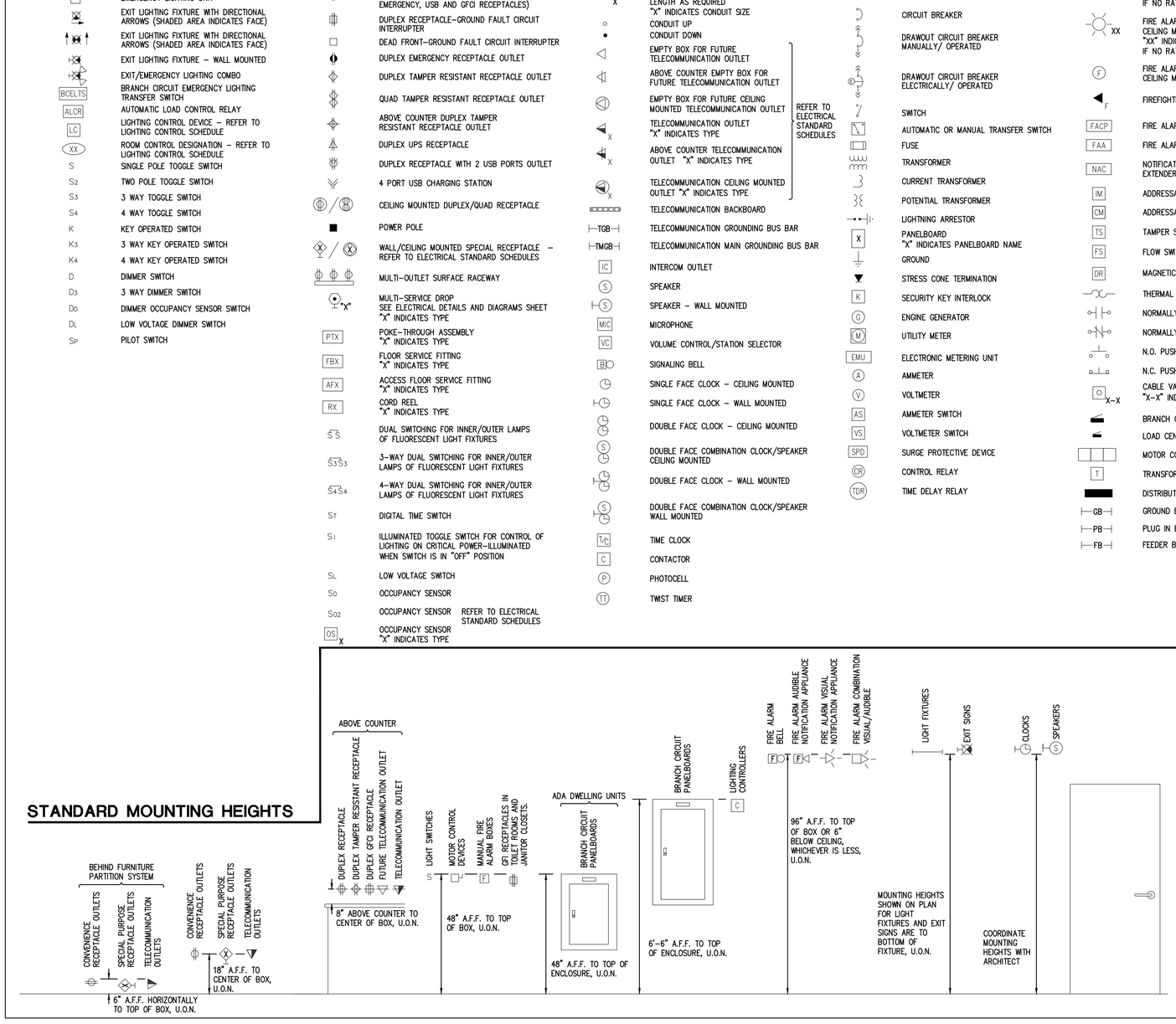
ABBREVIATION	DESCRIPTION
A	AMPERES
AER	ARC ENERGY REDUCTION
AF	AMPERES FRAME (BREAKER RATING)
AFCI	ARC FAULT CIRCUIT INTERRUPTER
A.F.F.	ABOVE FINISH FLOOR
AIC	AMPS INTERRUPTING CAPACITY
AL	AUDIENCE LEFT
ALCR	AUTOMATIC LOAD CONTROL RELAY
AR	AUDIENCE RIGHT
AT	AMPERES TRIP (BREAKER SETTING)
ATS	AUTOMATIC 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
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

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Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Horizon High School

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Hamtramck, MI 48212

PROJECT NO.

22-106C

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STP

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.

BRANCH CIRCUIT VOLTAGE DROP WIRING SCHEDULE FOR SINGLE PHASE CIRCUITS

BRANCH CKT RATING (A)	WIRE SIZE (AWG)	MAXIMUM BRANCH CIRCUIT LENGTH (IN FEET)				
		120V	208V	240V	277V	480V
20A	12	83	143	165	191	331
	10	128	222	256	295	511
	8	201	348	402	464	804
	6	313	542	625	721	1250
30A	10	85	148	170	197	341
	8	134	232	268	309	536
	6	208	361	417	481	833
	4	313	542	625	721	1250

GENERAL NOTES:
1. THE ABOVE TABLE VALUES ARE BASED ON COPPER CONDUCTORS, IN STEEL CONDUIT, WITH A LOAD POWER FACTOR OF 0.85 PER NEC CHAPTER 9, TABLE 9.
2. PROVIDE BRANCH CIRCUIT CONDUCTORS AS INDICATED IN THE TABLE ABOVE FOR ALL LIGHTING AND RECEPTACLE BRANCH CIRCUITS. WHERE BRANCH CIRCUITS SERVE DEDICATED EQUIPMENT, THE CONTRACTOR MAY PERFORM VOLTAGE DROP CALCULATIONS BASED ON ACTUAL EQUIPMENT CONNECTED LOAD AND PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO A MAXIMUM OF 3%.
3. CONDUCTOR SIZES ARE BASED ON MAXIMUM OF 9 CURRENT CARRYING CONDUCTORS IN A SINGLE CONDUIT.
4. LIMITS FOR CONDUCTOR LENGTHS SHOWN ARE BASED ON A MAXIMUM BRANCH CIRCUIT LOADING OF 64% OF THE BRANCH BREAKER RATING AND A MAXIMUM OF 3 PERCENT VOLTAGE DROP TO COMPLY WITH ASHRAE 90.1 AND THE NEC. FOR CIRCUITS LOADED GREATER THAN 64% OF BRANCH BREAKER RATING, THE CONTRACTOR SHALL PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO 3%.

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.

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)	RIGID STEEL CONDUIT (RSC)	FLEXIBLE METAL CONDUIT (FMC)	LIQUID TIGHT FLEXIBLE METAL CONDUIT (LFMC)	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					
	EXPOSED, WITH FREESTANDING SUPPORT		X	X		X					
	ROOFTOPS (WHEN APPROVED BY ENGINEER)		X	X		X					
FEEDERS – INTERIOR	CONCEALED, ACCESSIBLE CEILINGS	X		X	X						
	CONCEALED, INACCESSIBLE CEILINGS	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						
	EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	X		X	X						
	DAMP AND WET LOCATIONS	X		X		X					
BRANCH CIRCUITS – EXTERIOR	EXPOSED, SURFACE MOUNTED TO STRUCTURE		X			X					
	EXPOSED, WITH FREESTANDING SUPPORT		X			X					
	ROOFTOPS (WHEN APPROVED BY ENGINEER)		X			X					
BRANCH CIRCUITS – INTERIOR	CONCEALED, ACCESSIBLE CEILINGS	X			X				X		
	CONCEALED, INACCESSIBLE CEILINGS	X			X						
	EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE	X				X					
	EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE	X			X						
	EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	X			X						
	DAMP AND WET LOCATIONS	X				X		X			
SPECIAL APPLICATIONS	CONNECTION BETWEEN VFC AND MOTORS (KEYED NOTE 1)									X	
	CLASS 1 CONTROL CIRCUITS	X			X	X					
	CLASS 2 CONTROL CIRCUITS	X			X	X					X
	CLASS 3 CONTROL CIRCUITS	X			X	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.

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

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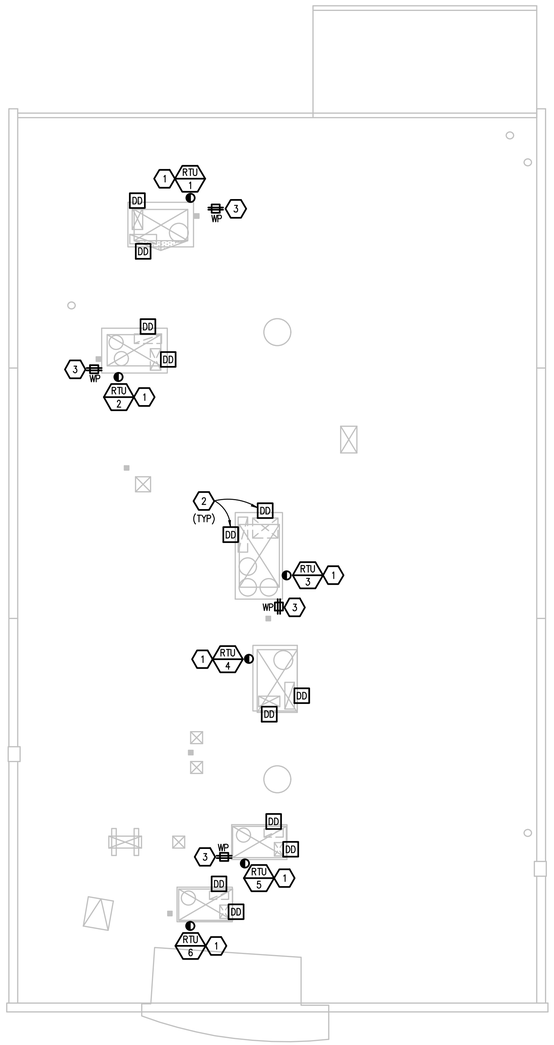
SHEET NAME
ELECTRICAL STANDARD SCHEDULES

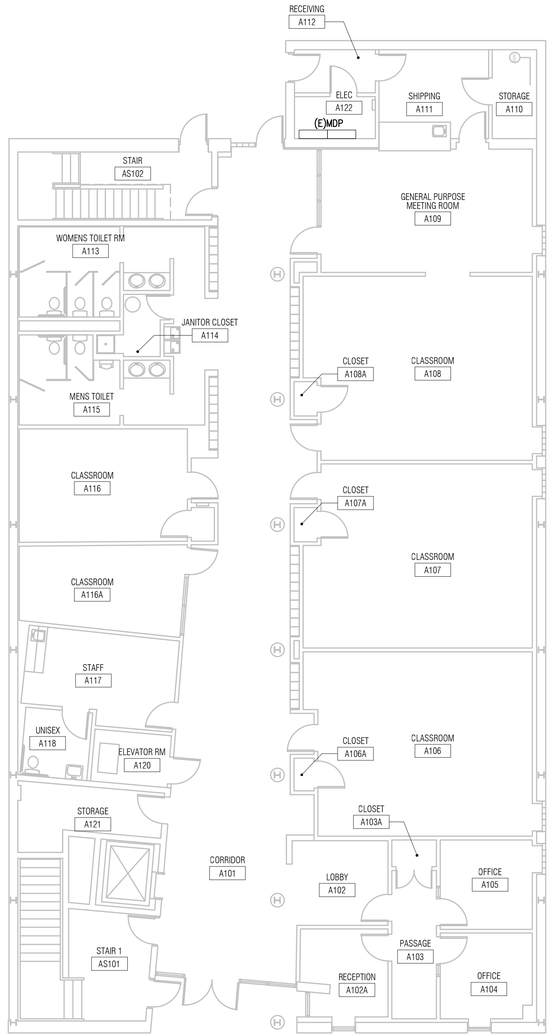
SHEET NO.
E0-02

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



ROOF ELECTRICAL PLAN

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



FIRST FLOOR 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 NATIONAL TIME 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 MECHANICAL EQUIPMENT TO MAINTAINED BRANCH CIRCUIT. EXTEND CONDUIT AND WIRE AS REQUIRED.
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 WITH THE TEMPERATURE CONTROL/FIRE ALARM CONTRACTOR. PROVIDE WEATHER PROOF ENCLOSURES AS REQUIRED.
3. CIRCUIT TO 20A, 1P SPARE CIRCUIT BREAKER IN NEAREST 208Y/120V, 3ø, 4W PANELBOARD WITH SPARE AMPACITY.

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KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Horizon High School

3225 Caniff
Hamtramck, MI 48212

PROJECT NO.

22-106C

ISSUES / REVISIONS

Owner Review	03/22/2022
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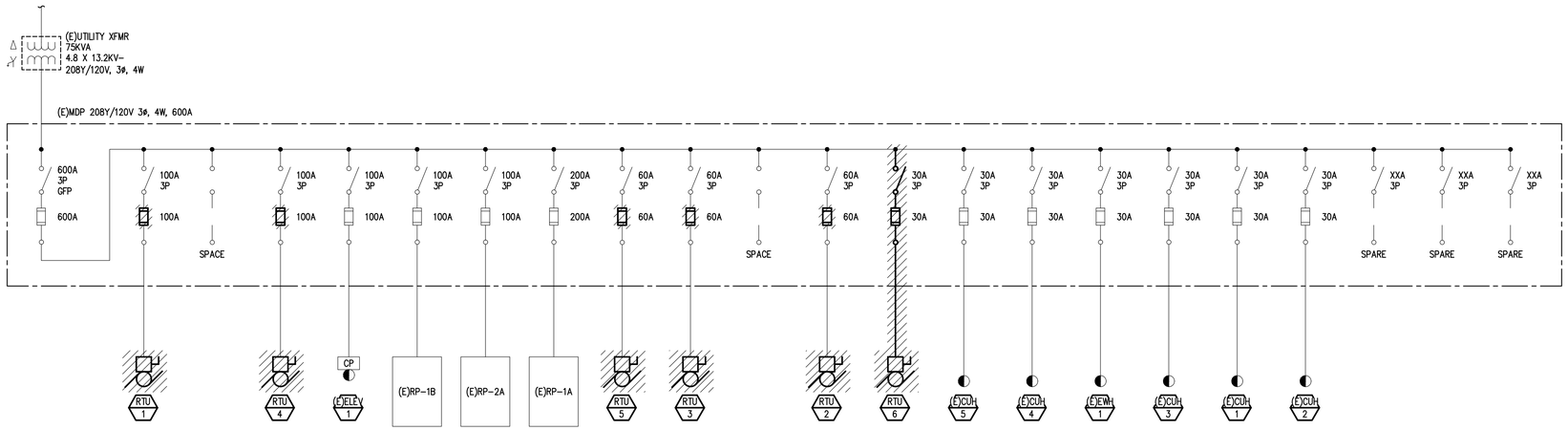
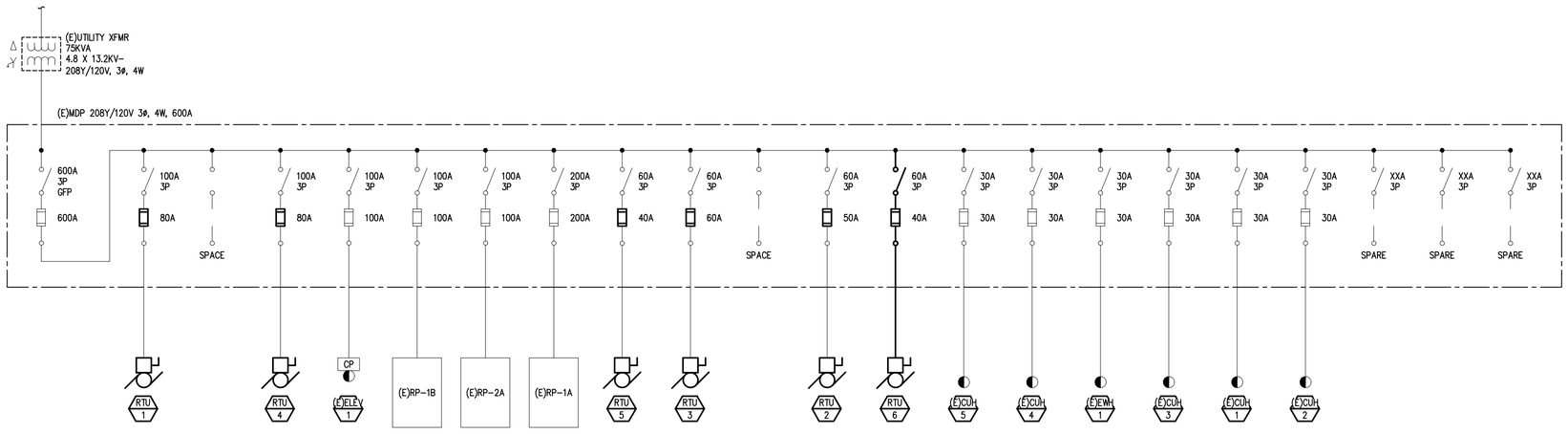
SHEET NAME
ELECTRICAL PLANS

SHEET NO.
E3-20

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. 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.





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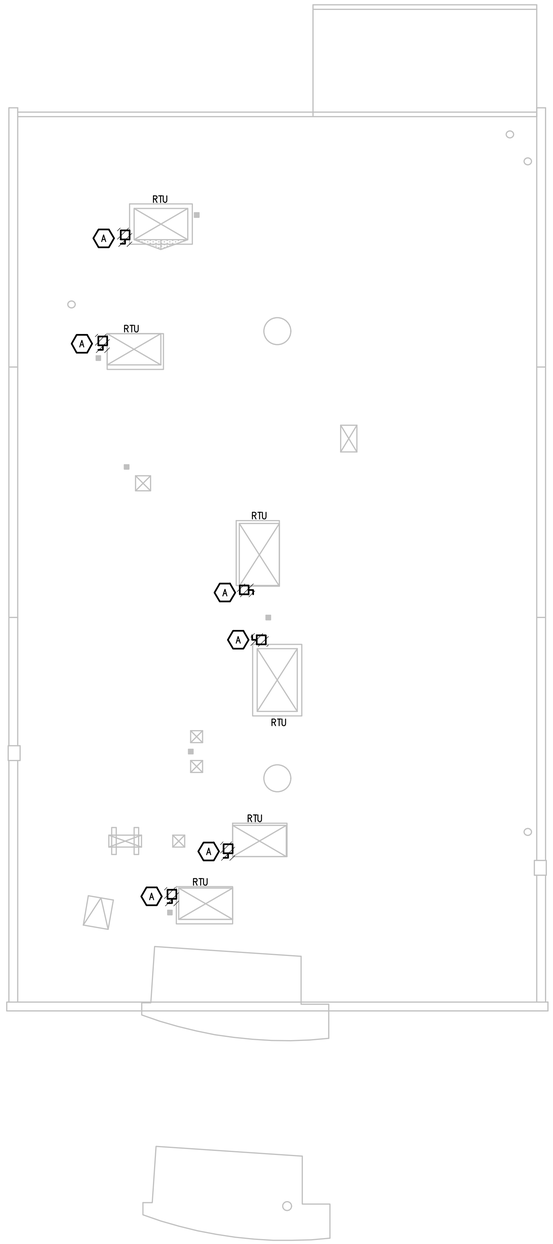
SHEET NAME

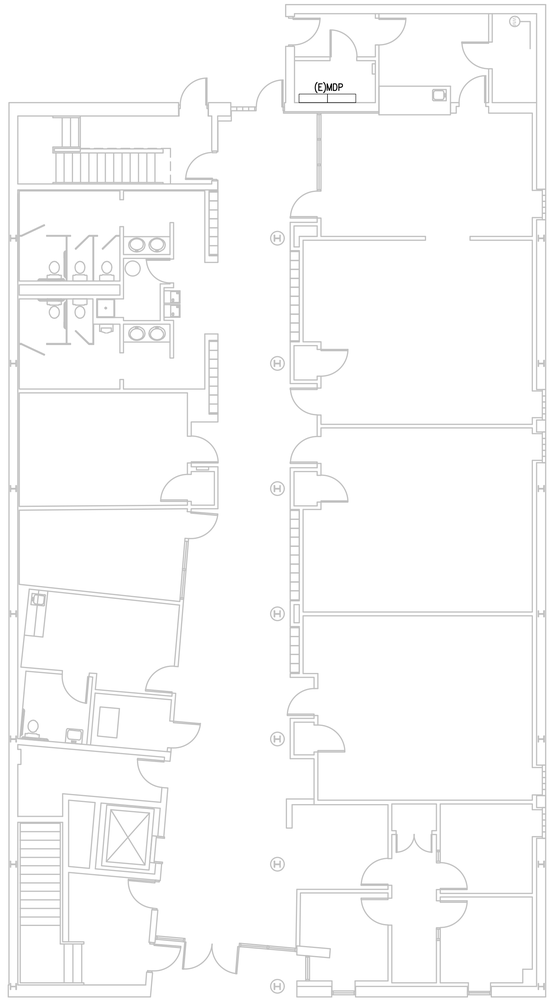
ONE LINE DIAGRAM

SHEET NO.

E5-01

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. RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS "SPARE".
10. PROVIDE UPDATED TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS ALTERATION.
11. 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. MECHANICAL EQUIPMENT BEING REPLACED. MAINTAIN BRANCH CIRCUIT FOR REUSE. REFER TO NEW WORK PLANS.

ROOF ELECTRICAL DEMOLITION PLAN

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

FIRST FLOOR ELECTRICAL DEMOLITION PLAN

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

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SHEET NAME
ELECTRICAL DEMOLITION PLANS

SHEET NO.
ED3-20

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 VENTILATING
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HWH	HOT WATER HEATING
HWHR	HOT WATER HEATING RETURN
HWHS	HOT WATER HEATING SUPPLY
HW	DOMESTIC HOT WATER
HW(___)	DOMESTIC HOT WATER (SPECIFIC TEMP °F)
HWR	DOMESTIC HOT WATER RETURN
HX	HEAT EXCHANGER
HZ	HERTZ
IAQ	INDOOR AIR QUALITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IH	INTAKE HOOD
IN	INCHES
IR	INFRARED HEATER
IW	INDIRECT WASTE
JC	JANITOR'S CLOSET
JP	JOCKEY PUMP
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
WAGD	WASTE ANESTHETIC GAS DISPOSAL
WB	WET BULB
WC	WATER CLOSET
WC	WATER COLUMN
WG	WATER GAUGE
WH	WALL HYDRANT
WMSD	WASHING MACHINE SUPPLY AND DRAIN BOX
WPD	WATER PRESSURE DROP
WT	WEIGHT
XFMR	TRANSFORMER
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
	CIRCULATING PUMP
CO	CLEAN OUT – IN FLOOR
CO	CLEAN OUT – FLANGE
	DIRECTION OF FLOW
	DIRECTION OF PITCH – DOWN
	FINNED TUBE RADIATION
	FIRE PROTECTION – SIAMESE CONNECTION – FREE STANDING
	FIRE PROTECTION – SIAMESE CONNECTION – WALL MOUNTED
	FIRE PROTECTION – SPRINKLER HEAD, CONCEALED
	FIRE PROTECTION – SPRINKLER HEAD, PENDANT
	FIRE PROTECTION – SPRINKLER HEAD, UPRIGHT
	FIRE PROTECTION – SPRINKLER HEAD, SIDEWALL
	FLOOR DRAIN
	FLOOR DRAIN – ELEVATION
	FLOOR DRAIN – FUNNEL
	FLOOR DRAIN – FUNNEL, ELEVATION
	FLOW MEASURING DEVICE (FOR TEST AND BALANCING)
FS	FLOW SWITCH
FM	FLOW METER
HB	HOSE BIBB
MH	MANHOLE
	OPEN SITE DRAIN
	PIPE – ANCHOR
	PIPE – CAP OR PLUG
	PIPE – ELBOW DOWN
	PIPE – ELBOW UP
	PIPE – EXPANSION JOINT OR COMPENSATOR
	PIPE – FLANGE
	PIPE – HOSE AND BRAID FLEXIBLE CONNECTION
	PIPE – RUBBER FLEXIBLE CONNECTION
	PIPE – GUIDE
	PIPE – TEE DOWN
	PIPE – TEE UP
	PIPE – UNION
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)
F&T 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
T/P	VALVE – PRESSURE & TEMPERATURE RELIEF
VTR	VENT THROUGH ROOF
WH	WALL HYDRANT
	VALVE – OS&Y HORIZONTAL STEM
	VALVE – OS&Y VERTICAL STEM

DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
VTU-101	AIR TERMINAL UNIT
FH-101	AIR TERMINAL UNIT WITH HEATING COIL
FH-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

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

MECHANICAL DRAWING INDEX

SHEET NO.	SHEET TITLE
M0-01	MECHANICAL STANDARDS AND DRAWING INDEX
MD1-10	MECHANICAL DEMOLITION PLANS
MD1-20	ROOF MECHANICAL DEMOLITION PLAN
M3-10	MECHANICAL PLANS
M3-20	ROOF MECHANICAL PLAN
M6-01	MECHANICAL DETAILS
M7-01	MECHANICAL SCHEDULES
M7-02	MECHANICAL SCHEDULES
M8-01	TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES

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.
3d-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
8Ø 22x10 / 18x14Ø	DUCT SIZE NOTATION ALL SIZES IN INCHES OVAL DUCT RECTANGULAR DUCT
1	CONSTRUCTION KEY NOTE (NUMBER) OR DEMOLITION KEY NOTE (LETTER)
EF-1	EQUIPMENT DESIGNATION, (i.e. EXHAUST FAN NUMBER 1)
HW-1	PIPING RISER DESIGNATION (i.e. HOT WATER RISER NUMBER 1)
	NEW SYSTEM COMPONENT EXISTING SYSTEM COMPONENT TO REMAIN POINT OF NEW CONNECTION SYMBOL
1 / M5.1	SECTION OR PLAN NUMBER SHEET WHERE SECTION IS DRAWN
	AREA OF ENLARGEMENT
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

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

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

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KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Horizon High School

3225 Caniff
Hamtramck, MI 48212

PROJECT NO.

22-106C

ISSUES / REVISIONS

Owner Review	03/22/2022
Bidding - Construction	04/07/2022

DRAWN BY

JPG

CHECKED BY

SVM

APPROVED BY

SVM

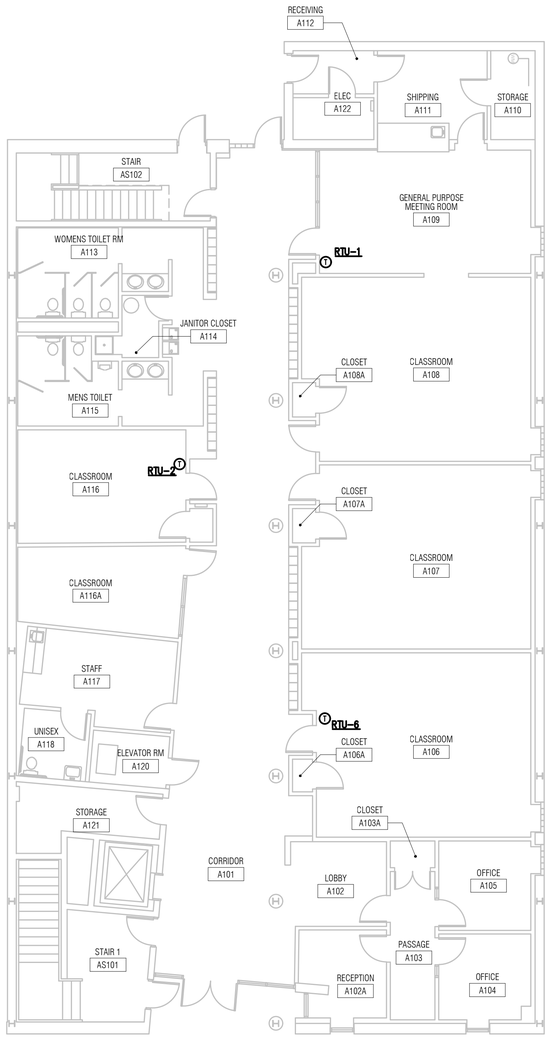
SHEET NAME

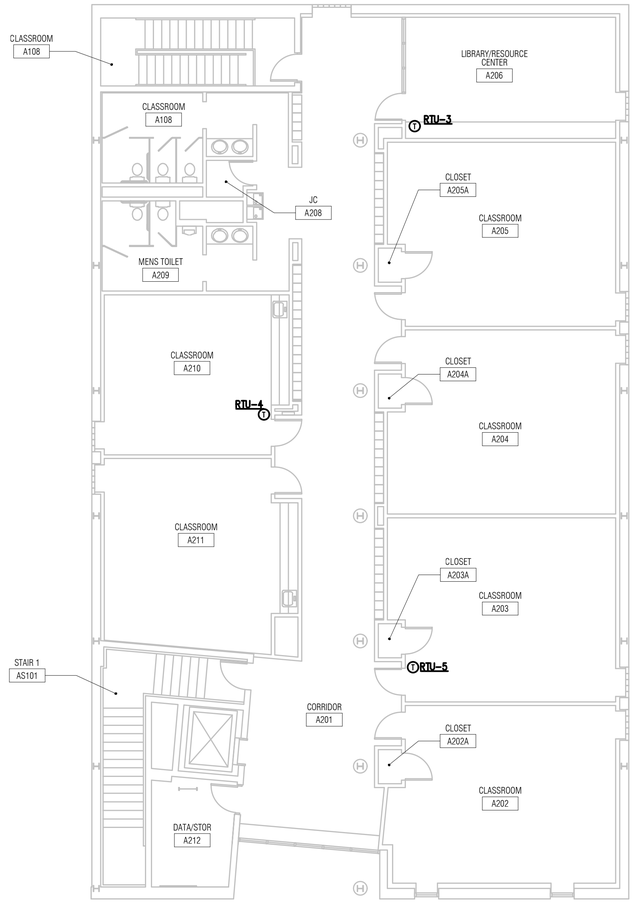
MECHANICAL STANDARDS AND DRAWING INDEX

SHEET NO.

M0-01

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





PLUMBING GENERAL NOTES:

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

SHEET METAL GENERAL NOTES:

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

(#) CONSTRUCTION KEY NOTES:

1. CONNECT RTU SUPPLY AND RETURN DUCTWORK TO EXISTING DUCTWORK IN CEILING BELOW.
2. PROVIDE ROOF CURB ADAPTER. APPROXIMATE EXISTING CURB SIZE IS 58x87. CONTRACTOR TO FIELD VERIFY PRIOR TO FABRICATION.
3. PROVIDE ROOF CURB ADAPTER. APPROXIMATE EXISTING CURB SIZE IS 45x73.5. CONTRACTOR TO FIELD VERIFY PRIOR TO FABRICATION.
4. PROVIDE ROOF CURB ADAPTER. APPROXIMATE EXISTING CURB SIZE IS 45x75. CONTRACTOR TO FIELD VERIFY PRIOR TO FABRICATION.

FIRST FLOOR MECHANICAL PLAN

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

SECOND FLOOR MECHANICAL PLAN

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

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PROJECT NO.

22-106C

ISSUES / REVISIONS

Owner Review	03/22/2022
Bidding - Construction	04/07/2022

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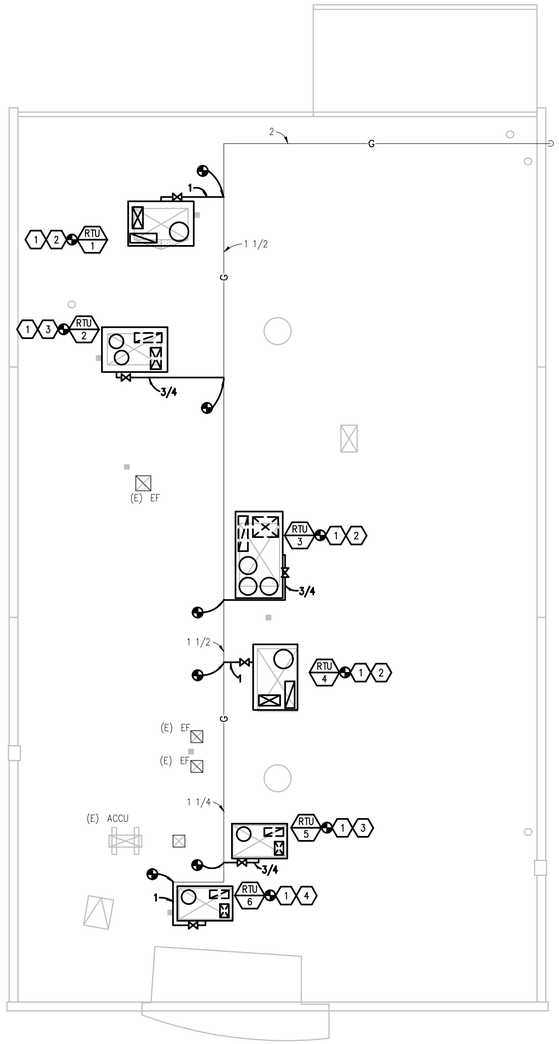
MECHANICAL PLANS

SHEET NO.
M3-10

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



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

PLUMBING GENERAL NOTES:

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

SHEET METAL GENERAL NOTES:

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

(#) CONSTRUCTION KEY NOTES:

1. CONNECT RTU SUPPLY AND RETURN DUCTWORK TO EXISTING DUCTWORK IN CEILING BELOW.
2. PROVIDE ROOF CURB ADAPTER. APPROXIMATE EXISTING CURB SIZE IS 58x87. CONTRACTOR TO FIELD VERIFY PRIOR TO FABRICATION.
3. PROVIDE ROOF CURB ADAPTER. APPROXIMATE EXISTING CURB SIZE IS 45x73.5. CONTRACTOR TO FIELD VERIFY PRIOR TO FABRICATION.
4. PROVIDE ROOF CURB ADAPTER. APPROXIMATE EXISTING CURB SIZE IS 45x75. CONTRACTOR TO FIELD VERIFY PRIOR TO FABRICATION.

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PBA Project No. 2022.0014

KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Horizon High School

3225 Caniff
Hamtramck, MI 48212

PROJECT NO.

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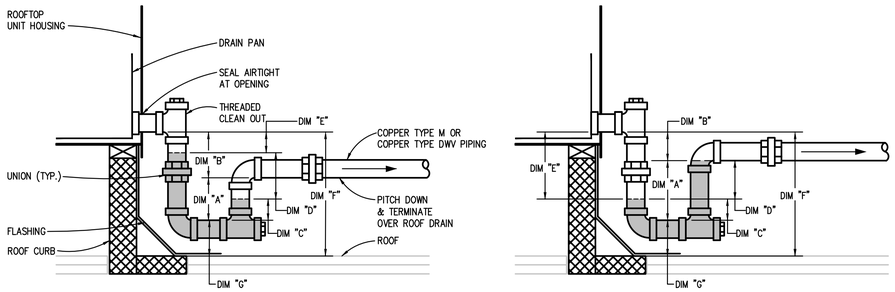
TRAP DIMENSION TABLE

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

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ROOF MOUNTED PIPING SUPPORT APPLICATION SCHEDULE

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

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. SUPPORT ELEMENTS IN CONTACT WITH BARE COPPER PIPE SHALL BE COPPER PLATED, PLASTIC OR PLASTIC COATED, FELT LINED, OR USE MANUFACTURED COPPER TUBE ISOLATORS

KEYED NOTES

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

DUCT SYSTEM INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES): 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	FIELD APPLIED JACKET MATERIAL: ALUMINUM	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	KEYED NOTES
DUCT SYSTEMS LOCATED INDOORS										
SUPPLY AIR, EXCEPT AS NOTED BELOW		1.5								A, E
OUTSIDE AIR AND MIXED AIR, EXCEPT AS NOTED BELOW		1.5								
EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, EXCEPT AS NOTED BELOW		1.5								
DUCT SYSTEMS LOCATED OUTDOORS										
RECTANGULAR DUCTS AND AIR PLENUMS, ALL TYPES				2					X	

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

GENERAL NOTES

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

KEYED NOTES

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

SCHEDULES GENERAL NOTES:

TYPICAL FOR ALL SCHEDULE SHEETS:

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

DUCT SYSTEM APPLICATION SCHEDULE

AIR SYSTEMS	DUCT MATERIAL: 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	
RETURN AIR WITHOUT TERMINAL UNITS	X														−2	A	5	
EXHAUST 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.

PLUMBING PIPING & VALVE APPLICATION SCHEDULE

PIPE SIZE (INCHES)	MATERIAL: SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (STD.)	GALV. STEEL (SCHED. 40)	STAINLESS STEEL (SCHED. 10)	PEX	PE PIPE	PE SHEATHED CARBON STEEL PIPE	CSST	NO-HUB CISP	PVC TYPE DWV	PP DRAINAGE PIPE	COPPER TYPE DWV	DUCTILE IRON PIPE	PRESSURE CONNECTIONS: SOLDERED	BRAZED	WELDED	THREADED	FLANGED	GROOVED	INSERT & CRIMP	FUSION	PRESSURE-SEAL	MECHANICALLY-FORMED TEE	MECHANICAL JOINT	PUSH-ON-JOINT	GRAVITY DWV CONNECTIONS: SOLVENT WELDED	SOLDERED	FUSION	CISP HUBLESS	HEAVY-DUTY HUBLESS	ISOLATION VALVES: BALL	AGA BALL	GENERAL SERVICE BUTTERFLY	LUBRICATED PLUG	GATE	KEYED NOTES
ABOVEGROUND COLD CONDENSATE DRAIN - MIN. WORKING PRESSURE: 10 FT. HEAD OF WATER																																							
ALL SIZES			X												X		X	X																						
ABOVEGROUND FUEL GAS - MIN. WORKING PRESS.: 100 PSIG																																							
UP TO 2				X															X	X															X				E
2-1/2 TO 3				X															X		X														X				E
4 TO 10				X															X		X																X			E

GENERAL NOTES

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

KEYED NOTES

A. GROOVED AND FLANGED FITTINGS, JOINTS, AND COUPLINGS, IF INDICATED AS AN ACCEPTABLE SELECTION, MAY BE USED IN ACCESSIBLE LOCATIONS ONLY FOR THIS PIPING SYSTEM. ACCESSIBLE LOCATIONS ARE DEFINED AS EXPOSED CONSTRUCTION OR ABOVE LAY-IN CEILINGS.
B. JOINTS ARE NOT PERMITTED ON UNDERGROUND WATER PIPING.
C. USE CAST IRON DRAINAGE PATTERN (DURHAM) FITTINGS.
D. INSTALL IN CONTAINMENT JACKET, REFER TO SPECIFICATIONS.
E. VALVES, UNIONS, AND FLANGED JOINTS MAY BE USED IN ACCESSIBLE LOCATIONS ONLY, EXCLUDING CEILINGS USED AS AIR PLENUMS. ACCESSIBLE LOCATIONS ARE DEFINED AS EXPOSED CONSTRUCTION OR ABOVE LAY-IN CEILINGS. USE ONLY STEEL WELDED FITTINGS AND WELDED JOINTS IN CEILING USED AS AIR PLENUMS.
F. NO JOINTS ALLOWED UNDERGROUND.

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MECHANICAL SCHEDULES

SHEET NO.

M7-01

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 ADAPTER)	TOTAL UNIT ELECTRICAL						MODEL NO.	KEYED NOTES
		AIRFLOW CFM	MINIMUM OUTSIDE AIR FLOW CFM	E.S.P. IN. W.G.	FAN SUCTION OR DISCHARGE S.P. IN. W.G. AT COOLING COIL DRAIN PAN	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–1	–	4000	1500	1.00	+0.64/–0.64.	1.64	939	3.85	5	2782	0.41	–	–	–	82	68	58	57	108.37	73.76	–	R–410A	–	95	45	2	53.6	99	240	195	7/11 IN. WC.	156	2	PLEATED	13	–	–	NO	NO	18	115.9	76.75	63.4	2000	208	3	70	80	5	B	48HCUE11K3M 5–2W5J0	
RTU–2	–	2000	750	1.00	+1.00/–1.00.	2.00	2747	2.18	2.4	490	0.41	–	–	–	82	68.3	58.8	58.3	57.91	42.56	–	R–410A	–	95	45	1	45.0	86.7	110	88	7/11 IN. WC.	65	2	PLEATED	13	–	–	NO	NO	14	74.4	55.4	46.6	1000	208	3	35	50	5	B	48GCUN06K3M 5–2WH0Q	
RTU–3	–	3000	1150	1.00	+0.66/–0.66.	1.66	917	3.40	5	2782	0.41	–	–	–	82	68	59	58	75.39	56.34	–	R–410A	–	95	45	2	39.2	93.6	240	195	7/11 IN. WC.	156	2	PLEATED	13	–	–	NO	NO	18	115.9	76.8	63.4	2400	208	3	57	60	5	B	48LCU00BK4M 5–1R5G0	
RTU–4	–	4000	1500	1.00	+0.64/–0.64.	1.64	939	3.85	5	2782	0.41	–	–	–	82	68	58	57	108.37	73.76	–	R–410A	–	95	45	2	53.6	99	240	192	7/11 IN. WC.	156	2	PLEATED	13	–	–	NO	NO	18	115.9	76.75	63.4	2000	208	3	70	80	5	B	48HCUE11K3M 5–2W5J0	
RTU–5	–	1600	650	1.00	+0.98/–0.98	1.98	2631	1.92	2	490	0.41	–	–	–	82	68	59.7	58	45.39	32.04	–	R–410A	–	95	45	1	45.0	97.2	110	88	7/11 IN. WC.	65	2	PLEATED	13	–	–	NO	NO	14	74.4	47.4	46.6	900	208	3	31	40	5	B	48GCUN05K3M 5–2WH0Q	
RTU–6	–	1200	475	1.00	–	–	–	–	–	–	–	–	–	–	82	68	59.7	58	35.41	24.8	–	R–410A	–	95	45	1	45.2	97	110	88	7/11 IN. WC.	–	–	PLEATED	13	–	–	NO	NO	14	74.4	47.4	46.6	900	208	3	31	40	5	B	48GCUN04K3M 5–2WH0Q	

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.
6. ALL UNITS TO BE SUPPLIED WITH FULLY WELDED CURB ADAPTER. CONTRACTOR TO VERIFY EXISTING ROOF CURB SIZE PRIOR TO ORDERING ADAPTER.
7. UNITS TO COME WITH HOT GAS REHEAT

MAXIMUM SOUND POWER LEVELS																	
UNIT I.D.	UNIT INLET Lw BY OCTAVE BAND								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)	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	96.0	89.6	76.5	70.2	68.4	64.0	64.6	62.3	89.3	86.0	82.9	80.7	78.5	73.6	69.6	64.5
RTU–2	91.1	86.6	76.5	73.2	73.6	66.8	58.9	52.9	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3
RTU–3	96.8	89.4	77.9	69.9	67.8	63.1	63.4	61.7	89.3	86.0	82.9	80.7	78.5	73.6	69.6	64.5
RTU–4	96.0	89.6	76.5	70.2	68.4	64.0	64.6	62.3	89.3	86.0	82.9	80.7	78.5	73.6	69.6	64.5
RTU–5	91.4	87.3	76.9	74.0	74.2	67.5	59.5	53.4	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3
RTU–6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

NOTE: SEE NOTES UNDER PART "A"

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KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

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Phase 1
Horizon High School

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Hamtramck, MI 48212

PROJECT NO.

22-106C

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MECHANICAL SCHEDULES

SHEET NO.

M7-02

TEMPERATURE CONTROL - SYMBOLS LIST

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
CS	CURRENT SWITCH
	DAMPER – OPPOSED BLADE
	DAMPER – PARALLEL BLADE
M	DAMPER MOTOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
DPS	DIFFERENTIAL PRESSURE SWITCH
CM	FIRE ALARM SYSTEM, ADDRESSABLE CONTROL MODULE
P	GAUGE – PRESSURE
H	HUMIDITY SENSOR, DUCT MOUNTED
LS	LIMIT SWITCH
	LINE – ELECTRIC
	LINE – PNEUMATIC
M S	MOTOR STARTER
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
AI	SIGNAL – PACKAGED EQUIPMENT, ANALOG INPUT
AO	SIGNAL – PACKAGED EQUIPMENT, ANALOG OUTPUT
DI	SIGNAL – PACKAGED EQUIPMENT, DIGITAL INPUT
DO	SIGNAL – PACKAGED EQUIPMENT, DIGITAL OUTPUT
DD	SMOKE DETECTOR – DUCT MOUNTED
SD	SMOKE DETECTOR – SPACE MOUNTED

SCHEMATIC SYMBOLS (CONT.)

SYMBOL	DESCRIPTION
S/S	START/STOP RELAY
SPT	STATIC PRESSURE TRANSMITTER
SP	STATIC PRESSURE SENSOR OR PROBE
SW	SWITCH
T	TEMPERATURE SENSOR – DUCT MOUNTED AVG ELEMENT
T	TEMPERATURE SENSOR – DUCT MOUNTED RIGID ELEMENT
T	THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)
VFC	VARIABLE SPEED DRIVE
XF	TRANSFORMER

WIRING SYMBOLS

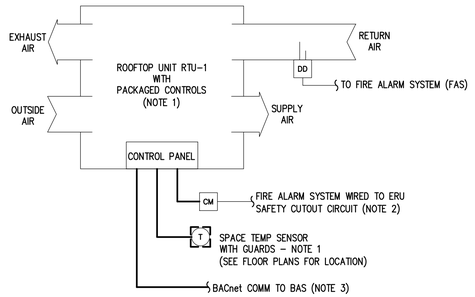
SYMBOL	DESCRIPTION
R	COIL – RELAY
	CONTACT – INSTANT OPERATING, NO
	CONTACT – INSTANT OPERATING, NC
	GROUND
	MOTOR, SINGLE PHASE
	SWITCH – LIMIT, NO
	SWITCH – PRESSURE & VACUUM, NC
	WIRE TERMINATION AT DEVICE
	WIRE TO WIRE TERMINATION

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.



PACKAGED RTU-1 THRU 6 FIELD WIRING & CONTROL

NOTES:

1. SINGLE ZONE 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 INSTALL SPACE TEMPERATURE SENSOR FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARDS FOR SPACE 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 ERU SAFETY CUTOUT CIRCUIT.
3. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM ROOFTOP UNIT CONTROL PANEL TO NEW BAS NETWORK SUPERVISORY CONTROLLER, COMMUNICATING BUT NOT LIMITED TO THE FOLLOWING POINTS AS AVAILABLE:

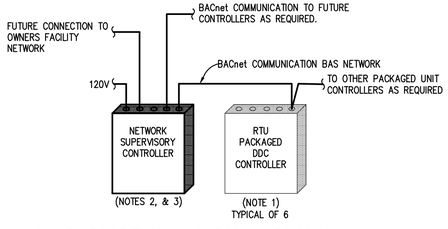
- OCCUPANCY MODE SCHEDULER (FROM BAS)
- EFFECTIVE OCCUPANCY MODE (TO BAS)
- SUPPLY FAN RUN STATUS (TO BAS)
- OCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- OCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- DISCHARGE AIR TEMP (TO BAS)
- HEATING/COOLING MODE STATUS (TO BAS)
- HEATING OUTPUT 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)

SEQUENCE OF OPERATION (SINGLE ZONE RTU):

1. FOR OCCUPIED MODE, RTU WITH PACKAGED CONTROLS SHALL MAINTAIN OCCUPIED SPACE TEMPERATURE HEATING OR COOLING SETPOINT WHILE SUPPLY FAN OPERATES CONTINUOUSLY. DAMPER ECONOMIZER SHALL BE AVAILABLE FOR COOLING MODE.
2. FOR UNOCCUPIED MODE, RTU WITH PACKAGED CONTROLS SHALL CYCLE SUPPLY FAN AS REQUIRED TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE HEATING OR COOLING SETPOINT. OA DAMPER SHALL REMAIN CLOSED.
3. BACnet OPEN PROTOCOL COMMUNICATIONS INTERFACE SHALL BE PROVIDED WITH PACKAGED CONTROLS AND CONNECTED TO OWNER'S BUILDING AUTOMATION SYSTEM THAT SHALL ALLOW UNIT SCHEDULING (UNIT SHALL OPERATE 24/7), FAN STATUSES, SPACE TEMP AND HUMIDITY ADJUSTMENT AND ADDITIONAL UNIT MONITORING AS AVAILABLE.
4. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE ROOFTOP UNIT THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.

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.

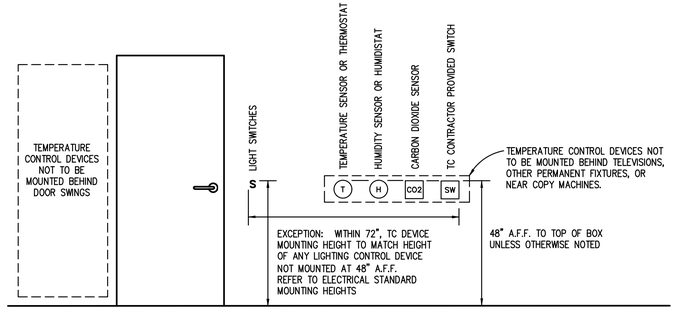


DDC SYSTEM ARCHITECTURE

NO SCALE

NOTES:

1. REFER TO TEMPERATURE CONTROL SCHEMATICS FOR THE REQUIRED POINTS ASSOCIATED FOR EACH SYSTEM.
2. TC CONTRACTOR SHALL PROVIDE NEW TRIDIUM NIAGARA N4 NETWORK SUPERVISORY CONTROLLER FOR CONNECTION TO OWNER'S FUTURE FACILITY NETWORK. COORDINATE BACnet CONNECTION TO PACKAGED CONTROLS..
3. TC CONTRACTOR SHALL PROVIDE REQUIRED POWER SUPPLIES FROM DEDICATED AND/OR SPARE CIRCUITS IDENTIFIED ON ELECTRICAL PANEL SCHEDULES. COORDINATE WITH ELEC CONTRACTOR. REFER TO ELECTRICAL DWGS FOR PANEL SCHEDULES AND PANEL LOCATIONS.
4. GRAPHICS FOR OPERATOR INTERFACE OF SYSTEMS ARE TO RESIDE ON THE JACE WITH VIEWABLE ACCESS FROM A LOCAL TOUCHSCREEN DISPLAY.



TC DEVICE STANDARD MOUNTING HEIGHTS DETAIL

NO SCALE

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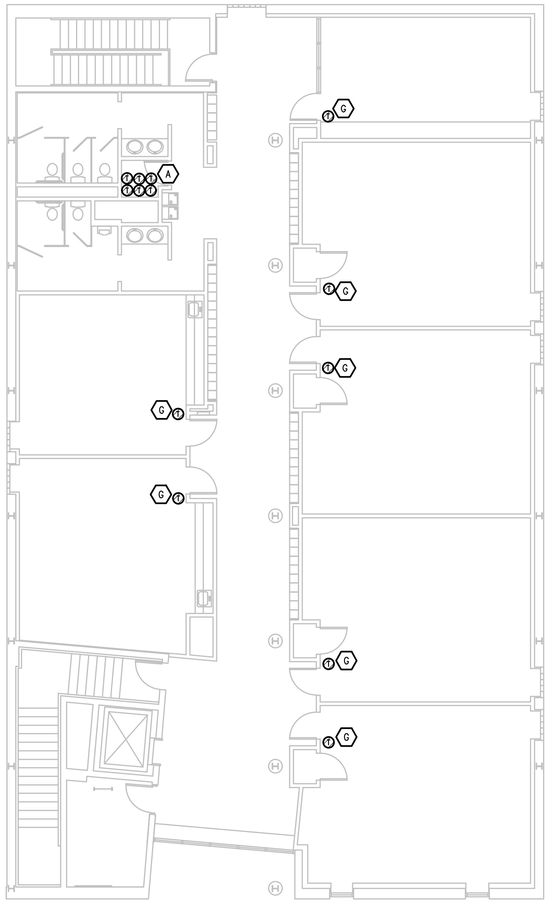
TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES

SHEET NO.

M8-01

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 (6) SIX ROOFTOP CENTRAL THERMOSTATS COMPLETE.

B. PRIOR TO REMOVAL PROVIDE PRE-DEMO AIRFLOW READINGS AT UNIT. REMOVE 4 TON GAS FIRED ROOFTOP UNIT AND ASSOCIATED BRANCH GAS PIPING INCLUDING SHUTOFF VALVE. REMOVE SHUTOFF VALVE. PREPARE CURB FOR NEW WORK. PREPARE SUPPLY & RETURN DUCT CONNECTIONS BENEATH UNIT FOR NEW WORK.

C. PRIOR TO REMOVAL PROVIDE PRE-DEMO AIRFLOW READINGS AT UNIT. REMOVE 5 TON GAS FIRED ROOFTOP UNIT AND ASSOCIATED BRANCH GAS PIPING INCLUDING SHUTOFF VALVE. REMOVE SHUTOFF VALVE. PREPARE CURB FOR NEW WORK. PREPARE SUPPLY & RETURN DUCT CONNECTIONS BENEATH UNIT FOR NEW WORK.

D. PRIOR TO REMOVAL PROVIDE PRE-DEMO AIRFLOW READINGS AT UNIT. REMOVE 6 TON GAS FIRED ROOFTOP UNIT AND ASSOCIATED BRANCH GAS PIPING INCLUDING SHUTOFF VALVE. REMOVE SHUTOFF VALVE. PREPARE CURB FOR NEW WORK. PREPARE SUPPLY & RETURN DUCT CONNECTIONS BENEATH UNIT FOR NEW WORK.

E. PRIOR TO REMOVAL PROVIDE PRE-DEMO AIRFLOW READINGS AT UNIT. REMOVE 8 TON GAS FIRED ROOFTOP UNIT AND ASSOCIATED BRANCH GAS PIPING INCLUDING SHUTOFF VALVE. REMOVE SHUTOFF VALVE. PREPARE CURB FOR NEW WORK. PREPARE SUPPLY & RETURN DUCT CONNECTIONS BENEATH UNIT FOR NEW WORK.

F. PRIOR TO REMOVAL PROVIDE PRE-DEMO AIRFLOW READINGS AT UNIT. REMOVE 12 TON GAS FIRED ROOFTOP UNIT AND ASSOCIATED BRANCH GAS PIPING INLCUDING SHUTOFF VALVE. REMOVE SHUTOFF VALVE. PREPARE CURB FOR NEW WORK. PREPARE SUPPLY & RETURN DUCT CONNECTIONS BENEATH UNIT FOR NEW WORK.

G. REMOVE ROOM TEMPERATURE SENSOR COMPLETE.

FIRST FLOOR MECHANICAL DEMOLITION PLAN

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

SECOND FLOOR MECHANICAL DEMOLITION PLAN

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

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PBA Project No. 2022.0014

KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Horizon High School

3225 Caniff
Hamtramck, MI 48212

PROJECT NO.

22-106C

ISSUES / REVISIONS

Owner Review	03/22/2022
Bidding - Construction	04/07/2022

DRAWN BY

JPG

CHECKED BY

SVM

APPROVED BY

SVM

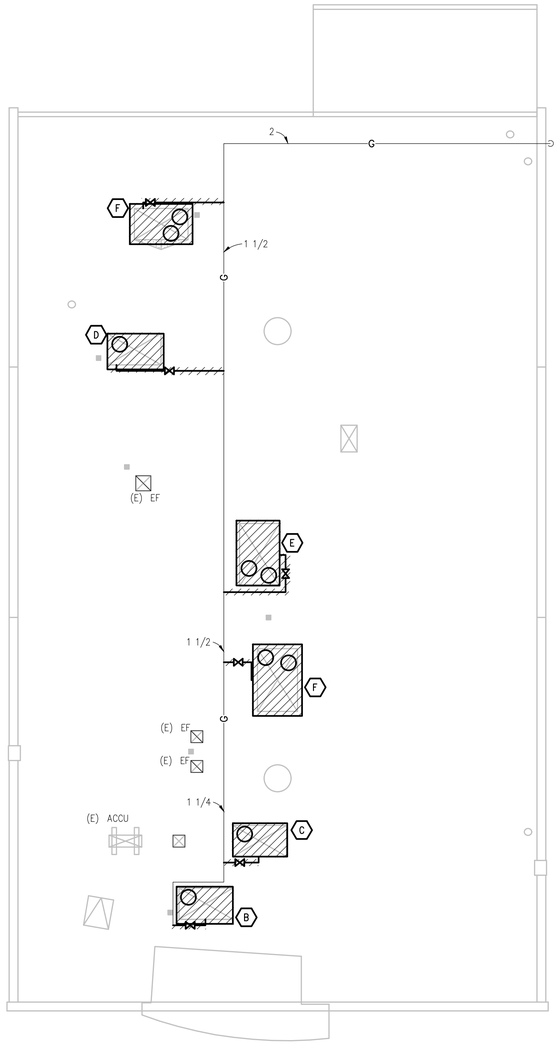
SHEET NAME

MECHANICAL DEMOLITION PLANS

SHEET NO.

MD1-10

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



ROOF 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 (6) SIX ROOFTOP CENTRAL THERMOSTATS COMPLETE.

B. PRIOR TO REMOVAL PROVIDE PRE-DEMO AIRFLOW READINGS AT UNIT. REMOVE 4 TON GAS FIRED ROOFTOP UNIT AND ASSOCIATED BRANCH GAS PIPING INCLUDING SHUTOFF VALVE. REMOVE SHUTOFF VALVE. PREPARE CURB FOR NEW WORK. PREPARE SUPPLY & RETURN DUCT CONNECTIONS BENEATH UNIT FOR NEW WORK.

C. PRIOR TO REMOVAL PROVIDE PRE-DEMO AIRFLOW READINGS AT UNIT. REMOVE 5 TON GAS FIRED ROOFTOP UNIT AND ASSOCIATED BRANCH GAS PIPING INCLUDING SHUTOFF VALVE. REMOVE SHUTOFF VALVE. PREPARE CURB FOR NEW WORK. PREPARE SUPPLY & RETURN DUCT CONNECTIONS BENEATH UNIT FOR NEW WORK.

D. PRIOR TO REMOVAL PROVIDE PRE-DEMO AIRFLOW READINGS AT UNIT. REMOVE 6 TON GAS FIRED ROOFTOP UNIT AND ASSOCIATED BRANCH GAS PIPING INCLUDING SHUTOFF VALVE. REMOVE SHUTOFF VALVE. PREPARE CURB FOR NEW WORK. PREPARE SUPPLY & RETURN DUCT CONNECTIONS BENEATH UNIT FOR NEW WORK.

E. PRIOR TO REMOVAL PROVIDE PRE-DEMO AIRFLOW READINGS AT UNIT. REMOVE 8 TON GAS FIRED ROOFTOP UNIT AND ASSOCIATED BRANCH GAS PIPING INCLUDING SHUTOFF VALVE. REMOVE SHUTOFF VALVE. PREPARE CURB FOR NEW WORK. PREPARE SUPPLY & RETURN DUCT CONNECTIONS BENEATH UNIT FOR NEW WORK.

F. PRIOR TO REMOVAL PROVIDE PRE-DEMO AIRFLOW READINGS AT UNIT. REMOVE 12 TON GAS FIRED ROOFTOP UNIT AND ASSOCIATED BRANCH GAS PIPING INLCUDING SHUTOFF VALVE. REMOVE SHUTOFF VALVE. PREPARE CURB FOR NEW WORK. PREPARE SUPPLY & RETURN DUCT CONNECTIONS BENEATH UNIT FOR NEW WORK.

G. REMOVE ROOM TEMPERATURE SENSOR COMPLETE.

PARTNERS

PARTNERS in Architecture, PLC

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