HPS HVAC Improvements - Phase 1

Community Center

11350 Charest, Hamtramck, MI 48212

PARTNERS

Architect:

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586-469-3600

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List of Drawings

PARTNERS

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LOCATION MAP

NORTH

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Community Center

11350 Charest St.
Hamtramck, MI 48212

PROJECT NO.

22-106B

ISSUES / REVISIONS

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

DRAWN BY

AAA

CHECKED BY

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

Q

QT	QUARRY TILE
QB	QUARRY TILE BASE
QTR	QUARTER

R

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

R (CONT.)

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

S

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

T

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

U

UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
UR	URINAL

V

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

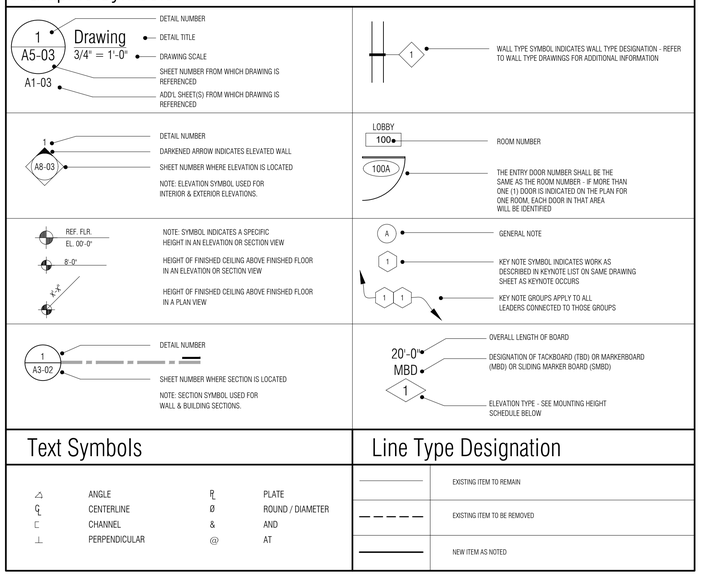
W

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

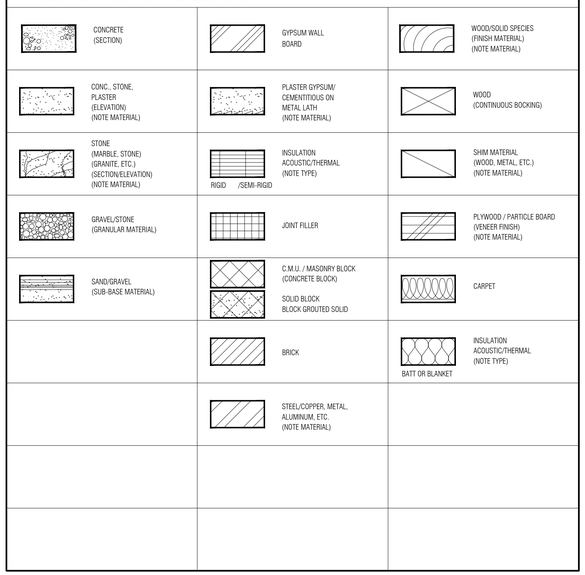
Y

YD	YARD

Graphic Symbols



Material Poche Indications



Text Symbols

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

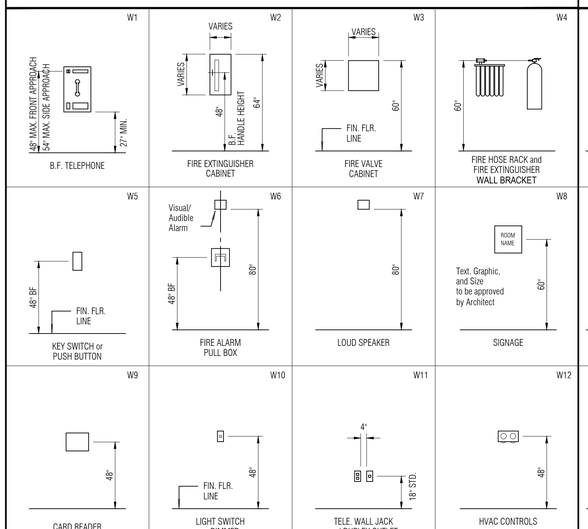
Line Type Designation

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

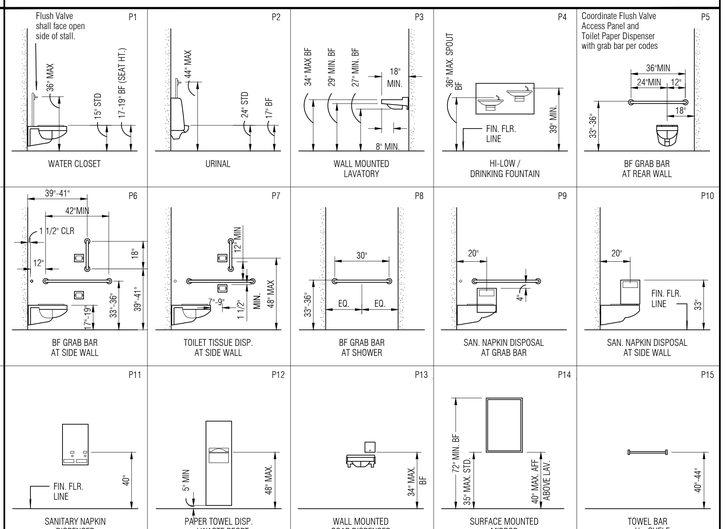
Mounting Height Schedule

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

WALL MOUNTED ACCESSORIES



PLUMBING FIXTURES and TOILET ACCESSORIES



PARTNERS

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P 586.469.3600

CONSULTANT

KEY PLAN

OWNER

Hamtramck Public Schools

PROJECT NAME

HVAC Improvements Phase 1 Community Center

11350 Charest St.
Hamtramck, MI 48212

PROJECT NO.

22-106B

ISSUES / REVISIONS

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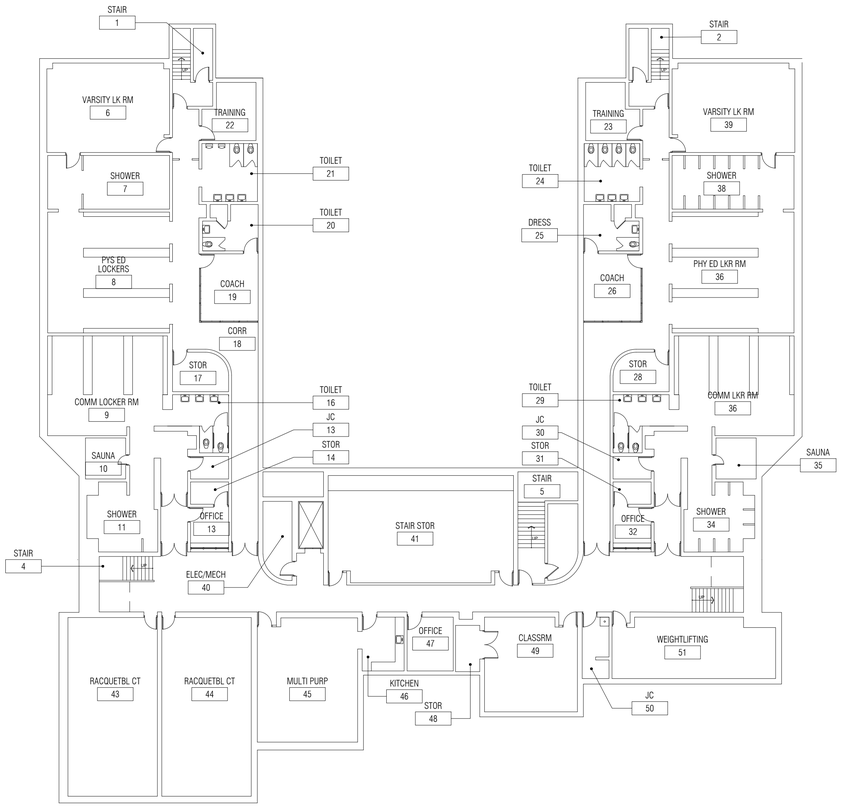
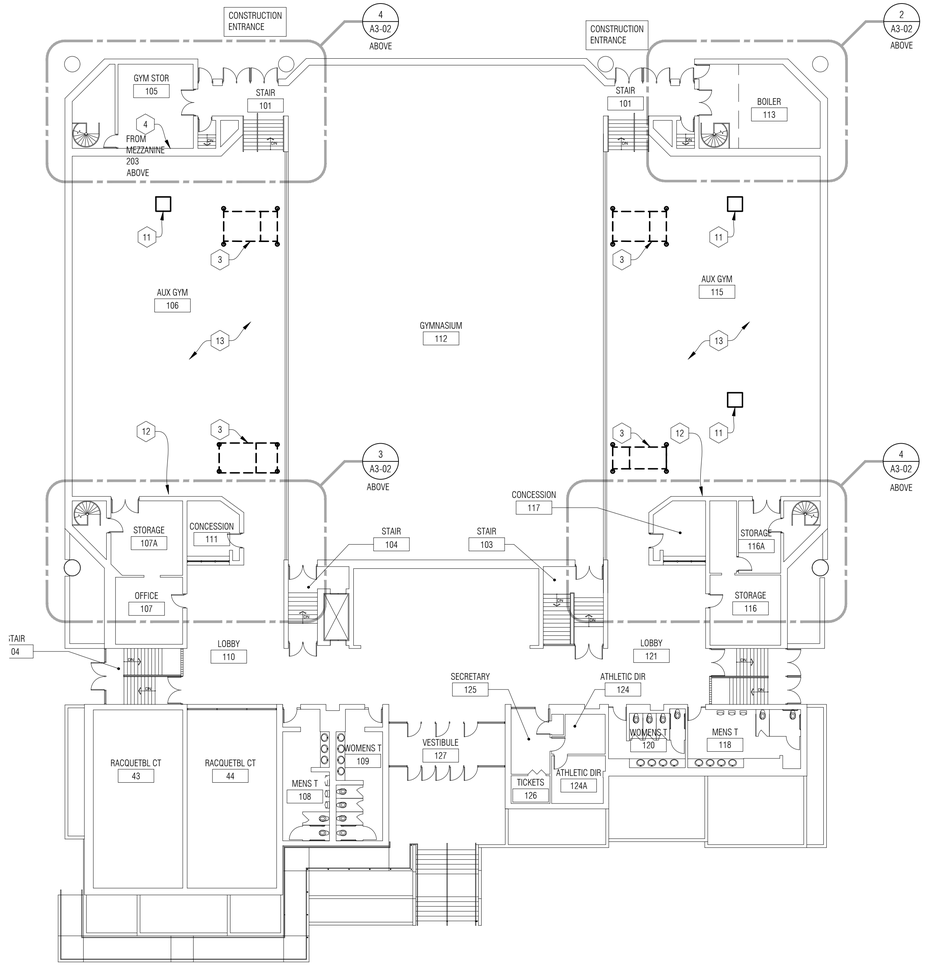
SHEET NAME

GENERAL INFORMATION

SHEET NO.

A0-01





N

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

N

1 Composite Main Level Floor Plan
1/16" = 1'-0"

BUILDING CODE INFORMATION

OWNER: HAMTRAMCK PUBLIC SCHOOLS
PROJECT: HVAC IMPROVEMENTS
ADDRESS: 11350 CHAREST, 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 IIB (UNPROTECTED, NON-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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ACS

APPROVED BY
MAM

SHEET NAME
COMPOSITE
FLOOR PLANS

SHEET NO.
A3-01

DEMOLITION GENERAL NOTES:

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

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

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

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

DEMOLITION GENERAL NOTES:

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

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

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

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

DEMO PLAN KEY NOTES:

D1 CAREFULLY REMOVE AND SALVAGE EXISTING CIRCULAR LOUVER FOR RE-INSTALLATION. PROTECT EDGE OF WALL PANELS AROUND PERIMETER OF LOUVER OPENING

D2 CUT AND REMOVE PORTION OF EXISTING WALL PANEL. REFER TO NEW WORK SECTIONS AND PLANS FOR EXTENT

D3 REMOVE STEEL BEAMS TO TOP OF STEEL COLUMN BELOW - TYP

D4 REMOVE EXISTING UTILITY CURB/HOOD. REMOVE DECK AND ROOFING AS REQUIRED FOR INSTALLATION OF NEW LARGER CURB/HOOD

FLOOR PLAN GENERAL NOTES:

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

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

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

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

E. PROTECT EXISTING ROOF MEMBRANE DURING CONSTRUCTION.

FLOOR PLAN KEY NOTES:

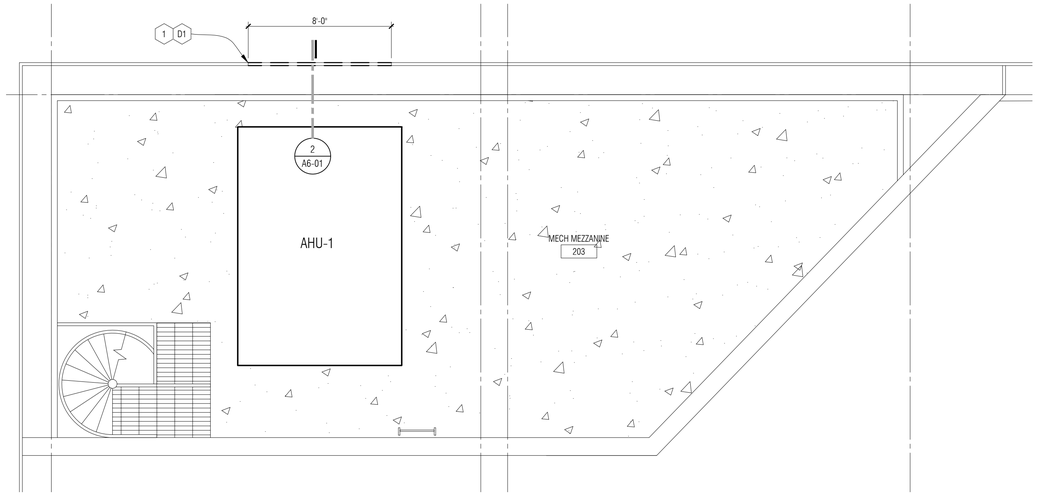
1 REINSTALL SALVAGED CIRCULAR LOUVER IN SAME LOCATION. PROVIDE TEMPORARY SUPPORT / PROTECTION FOR INSULAED PANEL OPENING DURING DEMO / NEW WORK - REPLACE DAMAGED ITEMS.

2 NEW CUSTOM HM DOUBLE ACCESS DOORS FOR DEMO AND NEW AHU INSTALLATION ACCESS - VERIFY AND COORDINATE FINISH OPENING MINIMUM SIZE W/ MECH CONTRACTOR AND UNIT SUPPLIER. REFER TO DETAILS, DOOR SCHEDULE AND SPECIFICATION.

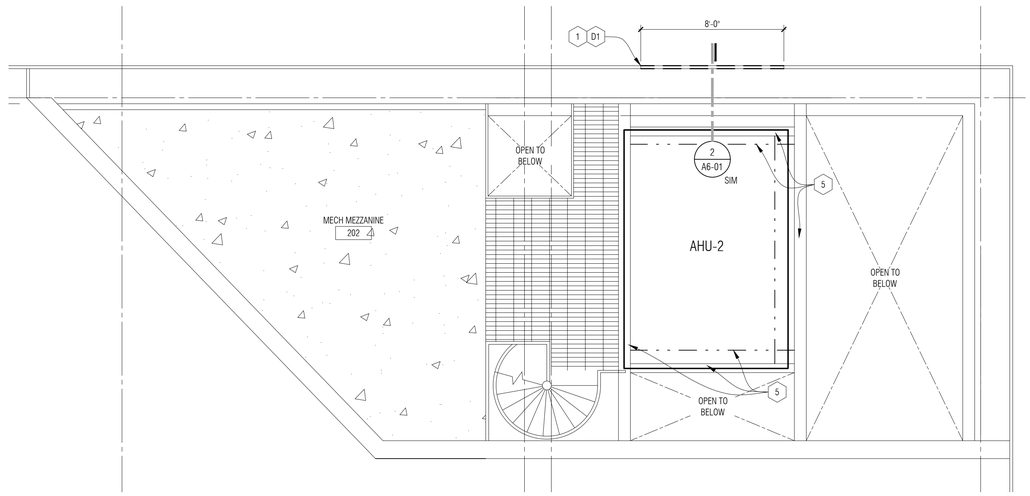
3 COORDINATE DOOR LOCATION W/ EXISTING STRUCTURAL PANEL SUPPORTS AND BRACING RODS. POSITION AND COORDINATE DOOR OPENING FOR EXISTING AHU DEMO AND NEW WORK INSTALLATION ACCESS W/ MECH.

4 APPROXIMATE LOCATION OF EXISTING O.A. DUCT PENETRATION TO EXISTING INTAKE PLENUM TO BE MODIFIED AND ALTERED TO SERVE NEW AHU UNIT. NEW O.A. INTAKE TRANSITION DUCT AND INSULATED BLANK OFF PANEL BY MECH - COORDINATE UNIT LOCATION, DUCT TRANSITION REQUIREMENTS IN FIELD.

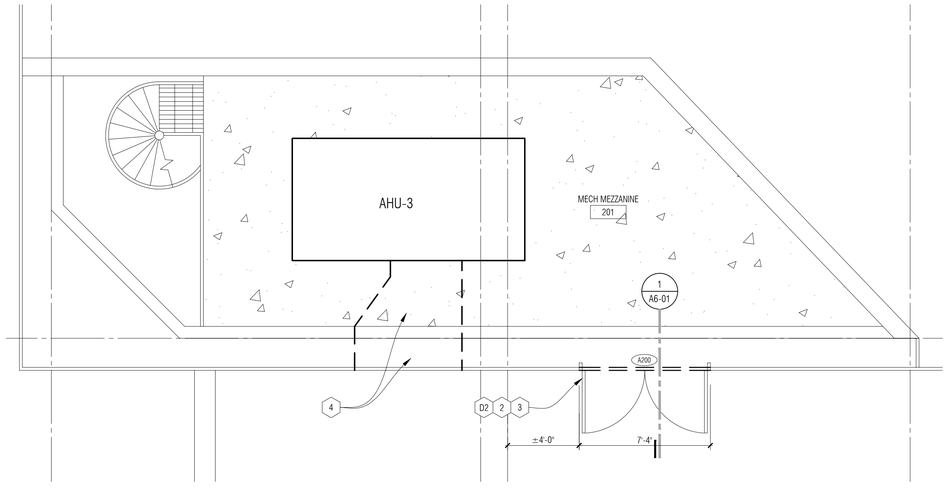
5 EXISTING STEEL BEAM SUPPORT STEEL TO BE MODIFIED TO SUPPORT NEW AHU UNIT - COORDINATE STEEL MODIFICATIONS TO LOCATE UNIT ADJACENT TO EXISTING ACCESS PLATFORM - REFER TO STRUCT - COORDINATE SUPPORT REQUIREMENTS AND LOCATION W/ MECH AND UNIT SUPPLIER.



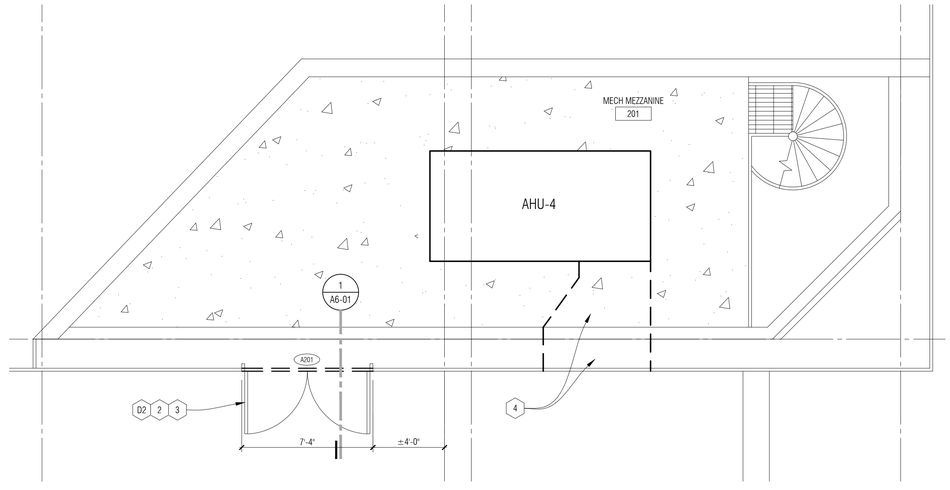
4 A3-01 Northeast Floor Plan
1/4" = 1'-0"



2 A3-01 Southeast Floor Plan
1/4" = 1'-0"



3 A3-01 Northwest Floor Plan
1/4" = 1'-0"



1 A3-01 Southwest Floor Plan
1/4" = 1'-0"

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PROJECT NAME

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Phase 1
Community Center

11350 Charest St.
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PROJECT NO.

22-106B

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MEZZANINE DEMO AND NEW WORK FLOOR PLANS

SHEET NO.
A3-02

DEMOLITION GENERAL NOTES:

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

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

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

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

DEMOLITION GENERAL NOTES:

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

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

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

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

DEMO PLAN KEY NOTES:

D1 CAREFULLY REMOVE AND SALVAGE EXISTING CIRCULAR LOUVER FOR RE-INSTALLATION. PROTECT EDGE OF WALL PANELS AROUND PERIMETER OF LOUVER OPENING

D2 CUT AND REMOVE PORTION OF EXISTING WALL PANEL. REFER TO NEW WORK SECTIONS AND PLANS FOR EXTENT

D3 REMOVE STEEL BEAMS TO TOP OF STEEL COLUMN BELOW - TYP

D4 REMOVE EXISTING UTILITY CURB/HOOD. REMOVE DECK AND ROOFING AS REQUIRED FOR INSTALLATION OF NEW LARGER CURB/HOOD

ROOF PLAN GENERAL NOTES:

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

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

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

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

ROOF PLAN KEY NOTES:

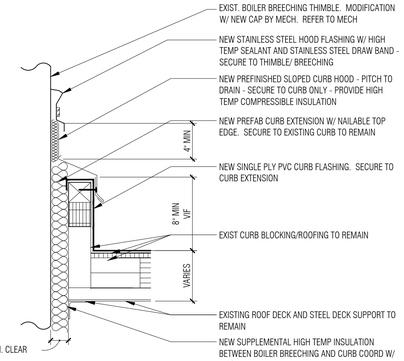
1 NEW STRUCTURAL STEEL ON EXISTING FRAMING SYSTEM - COORDINATE W/ STRUCTURAL

2 MECHANICAL UNIT ON STRUCTURAL STEEL PLATFORM - COORD W/ MECH FOR EXACT UNIT SIZE. COORDINATE W/ STRUCT DRAWINGS

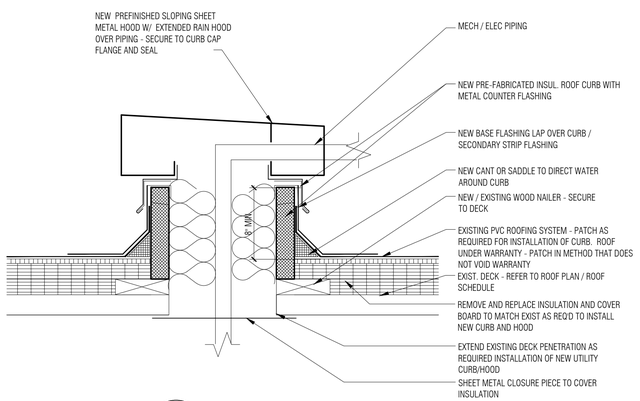
3 REMOVE EXISTING UNISTRUT ON EXISTING SUPPORT RAIL AND EXTEND WITH NEW GALV UNISTRUT AS REQUIRED TO SUPPORT NEW PIPING. EXISTING PIPE SUPPORT RAIL TO REMAIN - LOCATION AND QUANTITY APPROXIMATE - REF TO MECH

4 NEW 24" X 12" UTILITY HOOD/CURB AT LOCATION OF EXISTING UTILITY HOOD/CURB. REF DTL 2 ON THIS SHEET

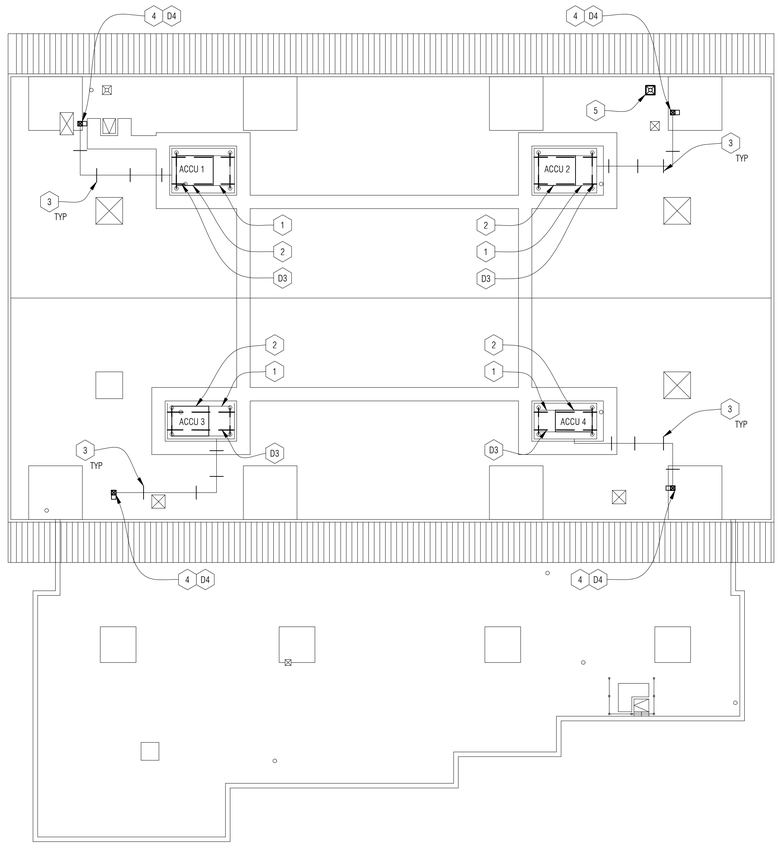
5 NEW ROOF CURB EXTENSION CAP AND INSUL THIMBLE AT BOILER BREECHING MOD. REF DTL 3 ON THIS SHEET - COORD W/ MECH



3 Exist Boiler Breeching Curb Detail
1 1/2" - 1'-0"



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



N

1 Composite Floor Plan
1/16" = 1'-0"

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SHEET NAME

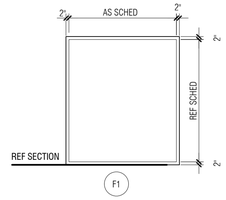
ROOF DEMO AND NEW WORK PLANS

SHEET NO.
A3-03

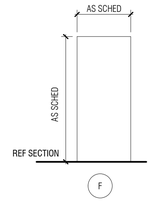
Door/ Opening Schedule

DOOR/OPN'G NO.	DOOR/OPEN'G SIZE (W x H) (CONTRACTOR TO VERIFY OPENING SIZE PRIOR TO MANUFACTURE OF DOORS/FRAMES)	DOOR			FRAME			DETAILS			HARDWARE SET #	LABEL (MIN)	DOOR/ OPENING KEY NOTES
		TYPE	MAT.	FINISH	TYPE	MAT.	FINISH	HEAD	JAMB	THRES / SILL			
A200	(2) 3'-6" x 4'-8"	F	GALV. HM	MATCH ADJACENT	F1	HM	MATCH ADJACENT	4/A6-01	5/A6-01	3/A6-01	001	--	-
A201	(2) 3'-6" x 4'-8"	F	GALV. HM	MATCH ADJACENT	F1	HM	MATCH ADJACENT	4/A6-01	5/A6-01	3/A6-01	001	--	-

Frame Type

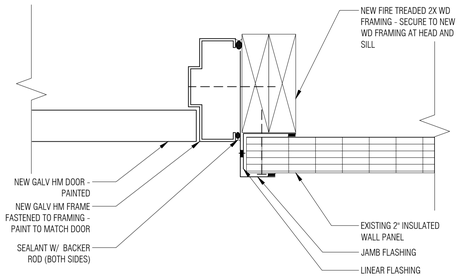


Door Type

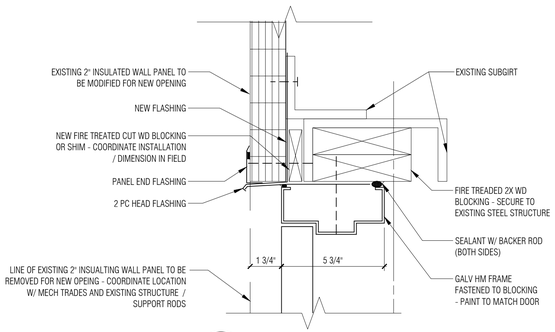


Door/ Openings General Notes:

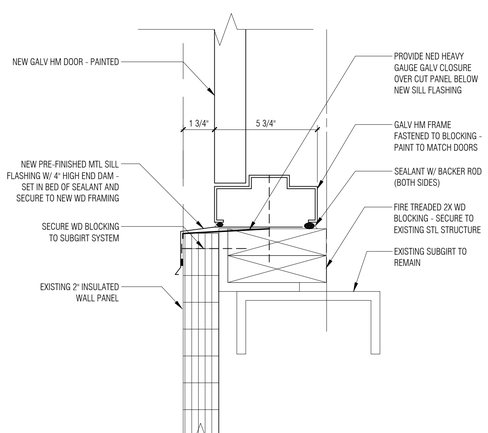
A. FOR TYPICAL HEAD/JAMB/SILL DETAIL-REFER TO BALANCE OF DRAWINGS FOR ADDITIONAL DETAILS.
B. HOLLOW METAL FRAME TO BE GALV AND HAVE A 2" PROFILE AND 5-3/4" DEPTH
C. PT-1 MATCH COLOR OF ADJACENT WALL PANELS - CONTRACTOR TO PROVIDE COLOR MATCH
D. COORDINATE DOOR SIZE WITH MECHANICAL CONTRACTOR - NOTIFY ARCHITECT IF DOOR SIZE IS SMALLER THAN THE PROPOSED NEW RTU-3 OR RTU-4'S LARGEST SPLIT SIZE
E. DOOR AND FRAME TO BE PAINTED TO MATCH THE COLOR OF THE ADJACENT METAL WALL PANEL



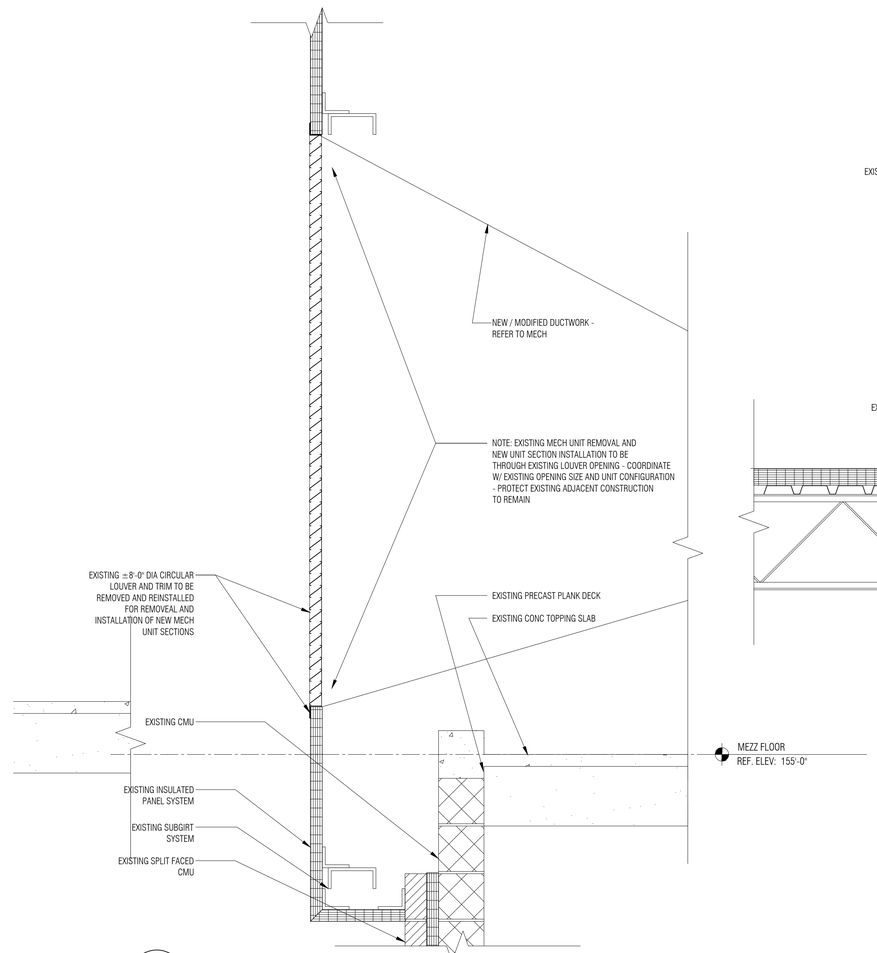
5 / A6-01 Wall Section @ Access Door Jamb
3" = 1'-0"



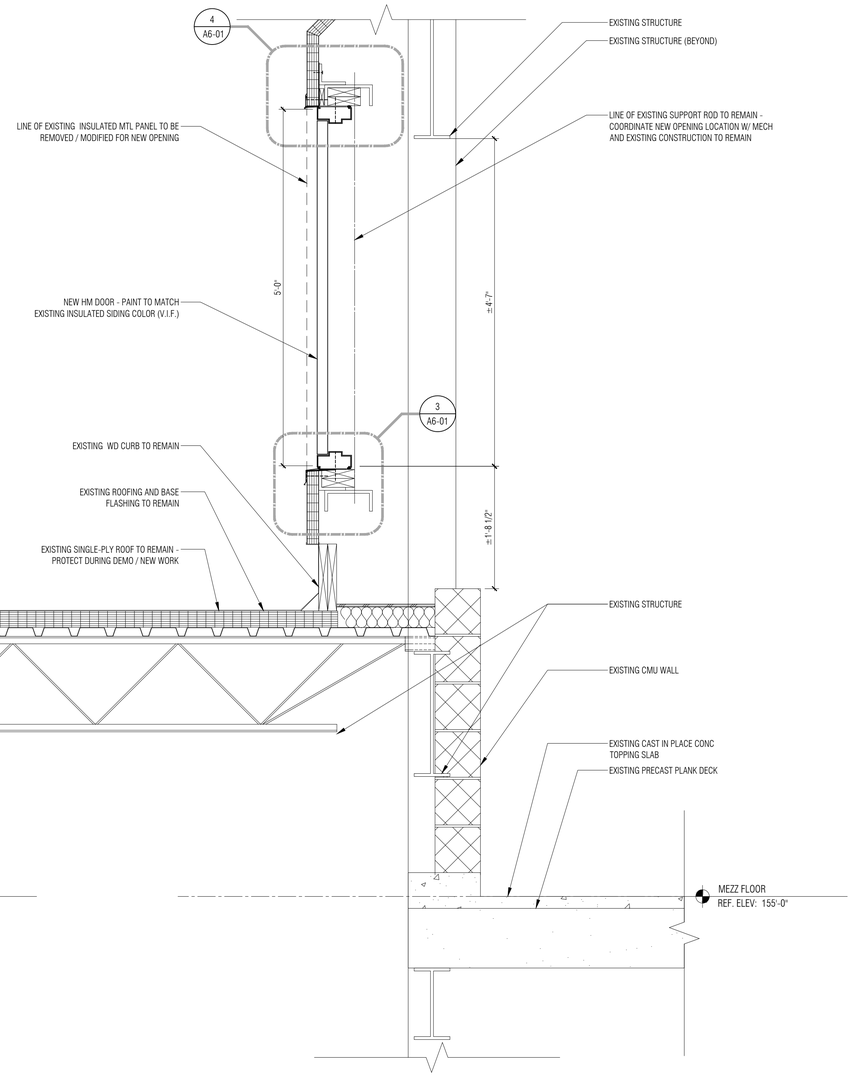
4 / A6-01 Wall Section @ Access Door Head
3" = 1'-0"



3 / A6-01 Wall Section @ Access Door Sill
3" = 1'-0"



2 / A2-02 Wall Section @ Salvaged Louver
1" = 1'-0"



1 / A2-02 Wall Section @ Access Door
1" = 1'-0"

P:\2022\22-106-HPS HVAC Bid Package 1\01_Drawings\CC\A6-01 Wall Sections and Door info.dwg - 4/7/2022 3:53:55 PM - Pam Elderkin

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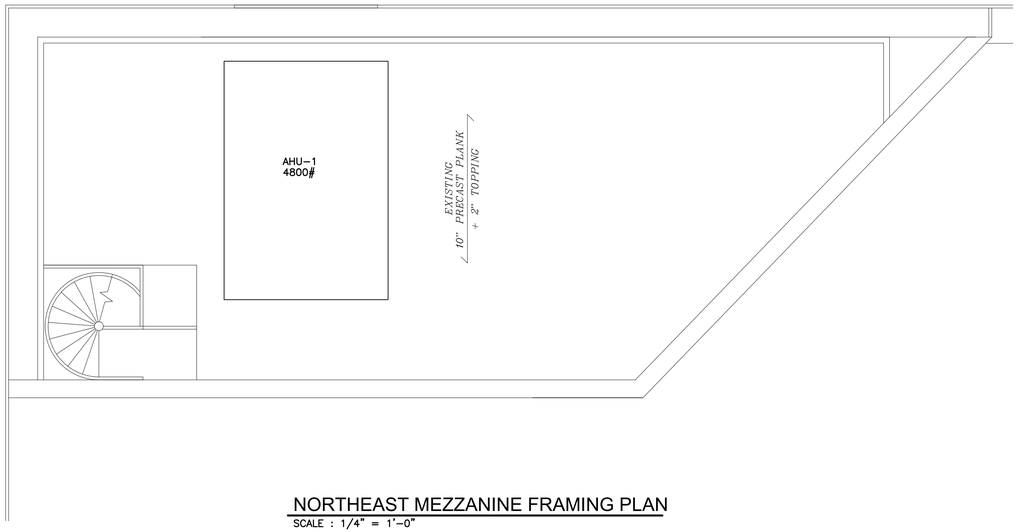
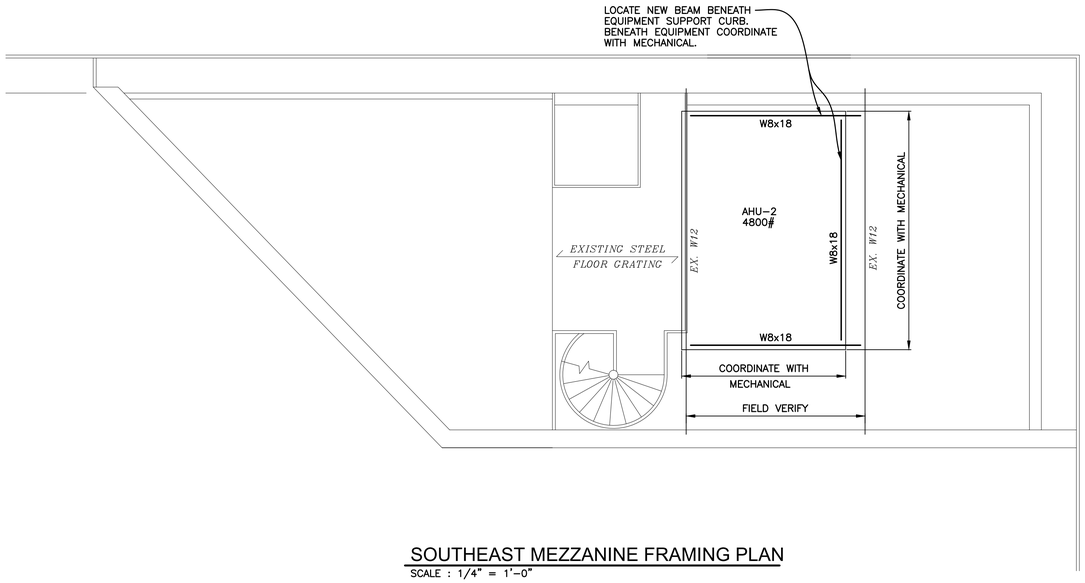
WALL SECTIONS, DETAILS & DOOR INFORMATION

SHEET NO.
A6-01



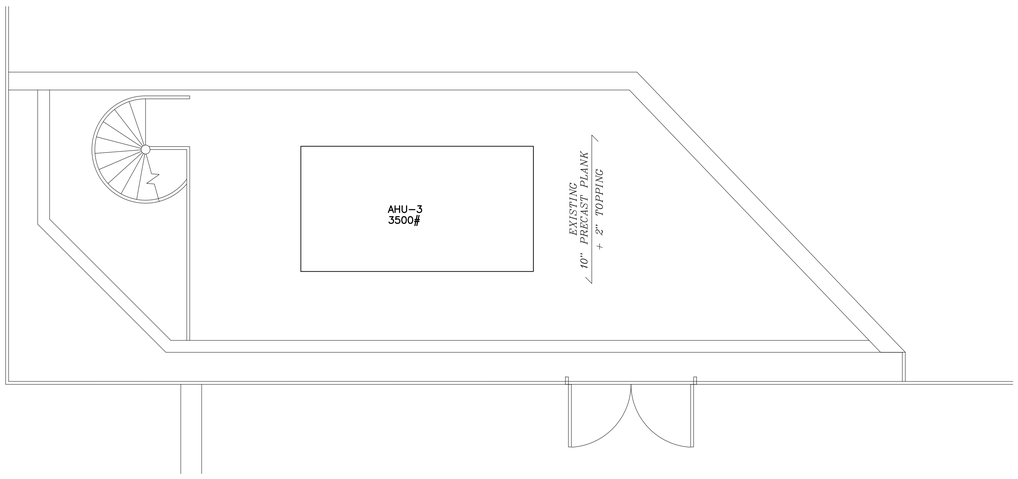
NORTHEAST MEZZANINE FRAMING PLAN

SCALE : 1/4" = 1'–0"



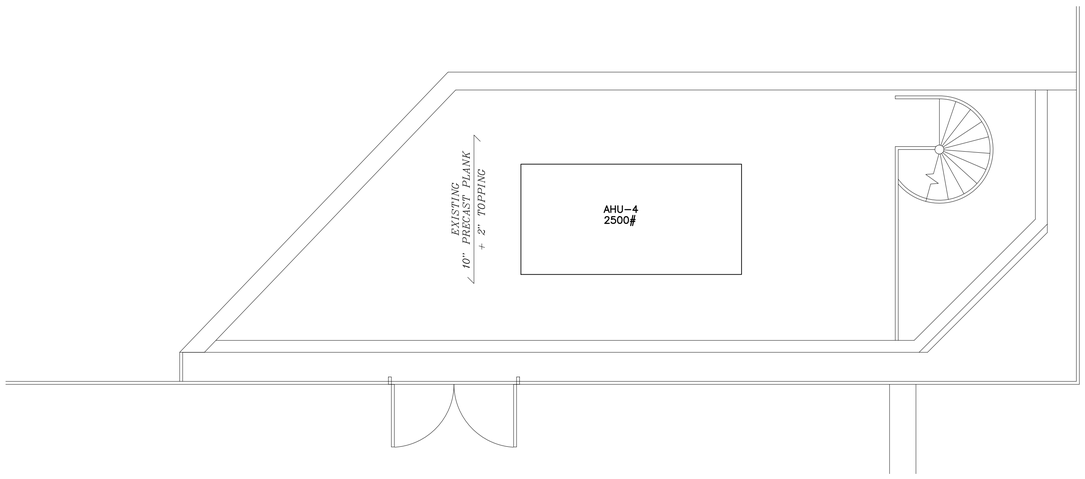
SOUTHEAST MEZZANINE FRAMING PLAN

SCALE : 1/4" = 1'–0"



NORTHWEST MEZZANINE FRAMING PLAN

SCALE : 1/4" = 1'–0"



SOUTHWEST MEZZANINE FRAMING PLAN

SCALE : 1/4" = 1'–0"

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FRAMING PLANS

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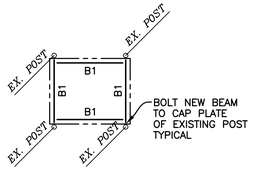
S3-02



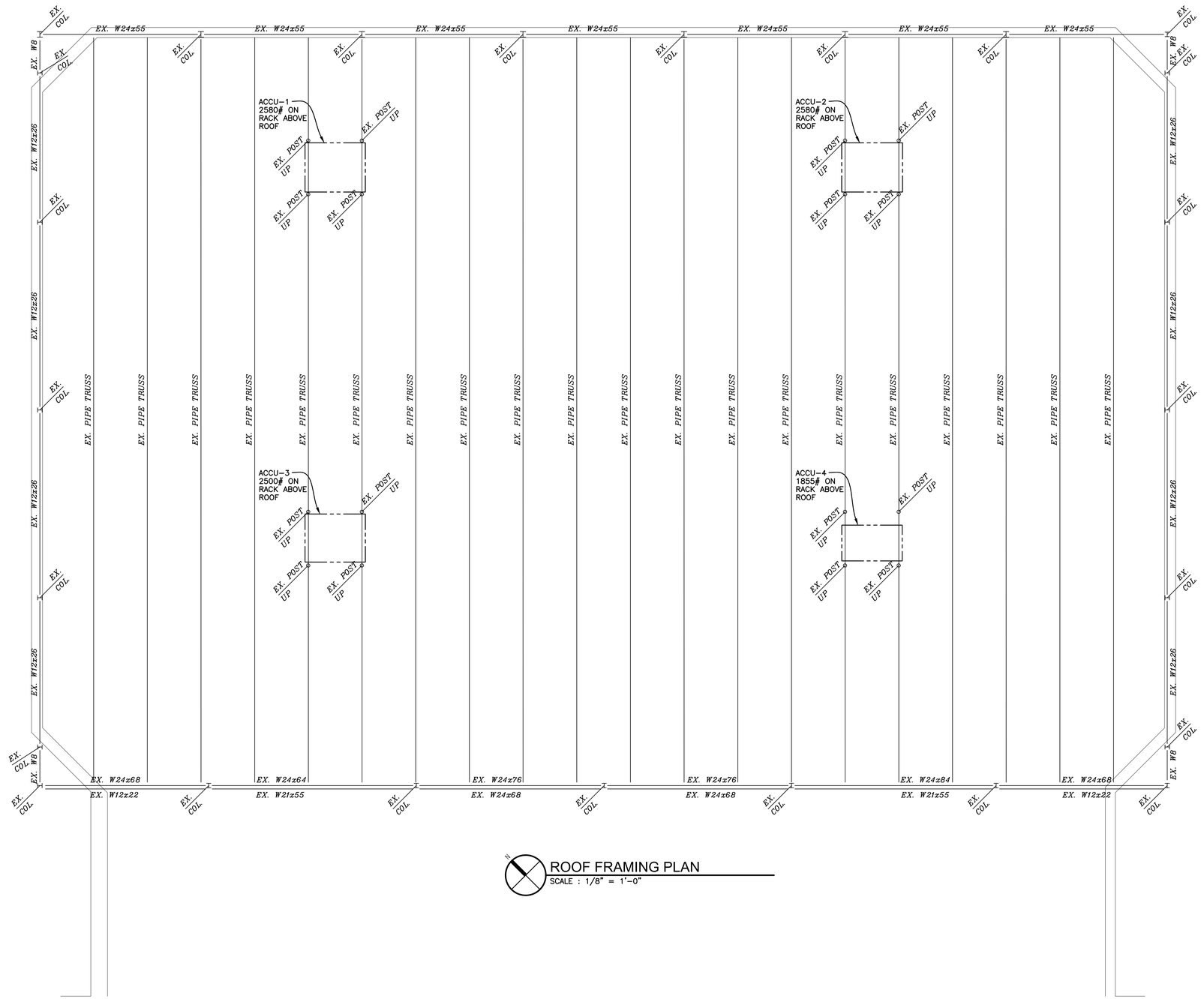
TYPICAL RACK FRAMING PLAN ABOVE ROOF

SCALE : 3/32" = 1'-0"

B1: W8x18

NOTES:

1. LOCATE BEAMS BELOW RTU SUPPORT CURB. VERIFY LOCATION WITH MECH. CONTRACTOR.
2. ALL STEEL TO BE GALVANIZED.



ROOF FRAMING PLAN

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

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SHEET NAME

ROOF FRAMING PLAN

SHEET NO.

S3-03

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.

6. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL RELEVANT DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATIONS AGAINST PURCHASED MANUFACTURER'S CERTIFIED EQUIPMENT DRAWINGS. DIMENSIONS THAT DEPEND UPON SPECIFIC EQUIPMENT SUCH AS ELEVATOR OPENINGS, MECHANICAL EQUIPMENT SUPPORTS, ETC. SHALL BE COORDINATED BY THE CONTRACTOR PRIOR TO SUBMITTAL TO THE ARCHITECT/ENGINEER. SUCH DIMENSIONS SHALL BE PROVIDED ON THE SHOP DRAWINGS BY THE CONTRACTOR PRIOR TO SUBMITTAL TO THE ARCHITECT/ENGINEER.

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.

STRUCTURAL STEEL

1. STEEL DESIGN, FABRICATION AND ERECTION TO BE IN ACCORDANCE WITH THE LATEST A.I.S.C. MANUAL AND SPECIFICATION FOR STRUCTURAL STEEL FOR BUILDINGS. ALL WIDE FLANGE BEAMS AND COLUMNS SHALL CONFORM TO THE LATEST ASTM. SERIAL DESIGNATION A992, GR50; ALL MISCELLANEOUS STEEL PLATES, BARS, ANGLES, ETC., SHALL CONFORM TO ASTM A36; STEEL TUBING TO BE ASTM A5OO, GRADE B; STEEL PIPE ASTM. A-53, GRADE B. ANCHOR BOLTS TO BE ASTM F1554 GRADE 36 KSI MINIMUM UNLESS OTHERWISE NOTED

2. ALL WELDED CONNECTIONS SHALL BE IN ACCORDANCE WITH THE LATEST AWS CODE, E7OXX ELECTRODES, WITH WELDING PERFORMED BY QUALIFIED WELDERS.

3. BOLTED CONNECTIONS SHALL BE MADE WITH A-325 OR A-490 BOLTS. ALL BOLTS ARE TO BE INSTALLED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS FOR "STRUCTURAL JOINTS USING A.S.T.M. A-325 OR A-490 BOLTS." TYPICAL BOLTED CONNECTIONS ARE "BEARING TYPE" UNLESS NOTED OTHERWISE.

4. DESIGN CONNECTIONS FOR MINIMUM ONE-HALF THE TOTAL ALLOWABLE UNIFORM LOAD PER A.I.S.C. BEAM LOAD TABLES, UNLESS OTHERWISE NOTED. (MIN. 2 BOLTS EACH CONNECTION).

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

6. TYPE OF CONSTRUCTION PER ASCE A2.2 IS TYPE 2 "SIMPLE FRAMING" UNLESS NOTED OTHERWISE.

7. TEMPORARY ERECTION SEATS SHALL BE PROVIDED AS RECOMMENDED ON PAGE 3-59 OF THE A.I.S.C. PUBLICATION "ENGINEERING FOR STEEL CONSTRUCTION".

8. ALL PROVISIONS OF THE RECOMMENDED CODE OF STANDARD PRACTICE FOR STEEL JOISTS AS ADOPTED BY THE STEEL JOIST INSTITUTE SHALL BE ADHERED TO.

9. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL ANGLES, PLATES, BARS, CLIPS, ETC., ATTACHED TO STRUCTURAL STEEL.

10. UNLESS OTHERWISE NOTED, ALL FLOOR AND ROOF OPENINGS SHALL BE FRAMED WITH L 5 X 3-1/2 X 5/16 L.L.V. VERIFY EXACT SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND WITH CONTRACTOR INVOLVED.

11. THE CONTRACTOR SHALL FURNISH ALL ACCESSORIES INCLUDING CLOSURES, "Z" CLOSURES, COLUMN CLOSURES, SCREED ANGLES AND GIRDER FILLERS AS

12. NO LOADS SHALL BE PERMITTED TO BE HUNG FROM ANY ROOF DECK. ALL HANGERS FOR CEILINGS, DUCTWORK, ELECTRICAL CONDUIT, PIPING, ETC., SHALL BE HUNG DIRECTLY FROM STRUCTURAL STEEL WORK OR SUPPLEMENTARY MEMBERS.

SPECIAL INSPECTION

1. WORK CONSTRUCTED SHALL BE INSPECTED BY AN INDEPENDENT TESTING AGENCY TO ENSURE COMPLIANCE WITH THE REQUIREMENTS SHOWN ON THE DRAWINGS. INSPECTIONS REQUIRED BY CHAPTER 17 OF THE OHIO BUILDING CODE; LOCAL BUILDING DEPARTMENTS AND THE CONTRACT DOCUMENTS SHALL BE PERFORMED BY AN INDEPENDENT TESTING AGENCY. SITE VISITS BY THE DESIGN ENGINEER DO NOT CONSTITUTE OR REPLACE INSPECTION

2. THE FOLLOWING ITEMS SHALL BE INSPECTED IN ACCORDANCE WITH IBC 2015 SEC. 1704 & 1705 BY A CERTIFIED SPECIAL INSPECTOR UNLESS NOTED OTHERWISE IN REMARKS COLUMN. ALL INSPECTION SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED. ALL PRODUCTS WITH ICC APPROVALS SHALL BE INSTALLED PER THE APPROVAL AND PER MANUFACTURER'S RECOMMENDATIONS. FOR MATERIAL TESTING REQUIREMENTS, SEE SPECIFICATIONS AND/OR GENERAL NOTES. TESTING AGENCY SHALL SEND COPIES OF ALL STRUCTURAL TESTING AND INSPECTION REPORTS DIRECTLY TO THE ARCHITECT.

INSPECTION OF FABRICATOR'S (SEC. 1704.2.5) *

FABRICATION AND IMPLEMENTATION PROCEDURES 1704.2.5.1

*SPECIAL INSPECTION IS NOT REQUIRED FOR FABRICATOR SHOP IF CERTIFICATE OF APPROVAL SUBMITTED BY FABRICATOR'S INSPECTION AGENCY PER EXCEPTION 1704.2.5.1

TABLE 1705.2.2
REQUIRED VERIFICATION AND
INSPECTION OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	NOT APPLICABLE	REFERENCED STANDARD
1. MATERIAL VERIFICATION OF COLD-FORMED STEEL DECK:				
a. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	-	X	-	APPLICABLE ASTM MATERIAL STANDARDS
b. MANUFACTURER'S CERTIFIED TEST REPORTS.	-	X	-	-
2. INSPECTION OF WELDING:				
a. COLD-FORMED STEEL DECK:				
1) FLOOR AND ROOF DECK WELDS.	-	X	-	AWS D1.3
b. REINFORCING STEEL:				
1) VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706.	-	X	-	AWS D1.4 ACI 318: SECTION 3.5.2
2) REINFORCING STEEL RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL STRUCTURAL WALLS OF CONCRETE AND SHEAR REINFORCEMENT.	X	-	-	
3) SHEAR REINFORCEMENT.	X	-	-	
4) OTHER REINFORCING STEEL.	-	X	-	

TABLE N5.4-1
INSPECTION TASKS PRIOR TO WELDING

INSPECTION TASKS PRIOR TO WELDING	QC	QA	NOT APPLICABLE
WELDING PROCEDURE SPECIFICATIONS (WPSs) AVAILABLE	P	P	-
MANUFACTURER CERTIFICATION FOR WELDING CONSUMABLES AVAILABLE	P	P	-
MATERIAL IDENTIFICATION (TYPE/GRADE)	O	O	-
WELDER IDENTIFICATION SYSTEM[1]	O	O	-
FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY) • JOINT PREPARATION • DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION) • BACKING TYPE AND FIT (IF APPLICABLE)	O	O	-
CONFIGURATION AND FINISH OF ACCESS HOLES	O	O	-
FIT-UP OF FILLET WELDS • DIMENSIONS (ALIGNMENT, GAPS AT ROOT) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION)	O	O	-
CHECK WELDING EQUIPMENT	O	-	-

[1]THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED. STAMPS, IF USED, SHALL BE THE LOW-STRESS TYPE.

SPECIAL INSPECTION (CONT.)

TABLE N5.4-2
INSPECTION TASKS DURING WELDING

INSPECTION TASKS DURING TO WELDING	QC	QA	NOT APPLICABLE
USE OF QUALIFIED WELDERS	O	O	-
CONTROL AND HANDLING OF WELDING CONSUMABLES • PACKAGING • EXPOSURE CONTROL	O	O	-
NO WELDING OVER CRACKED TACK WELDS	O	O	-
ENVIRONMENTAL CONDITIONS • WIND SPEED WITHIN LIMITS • PRECIPITATION AND TEMPERATURE	O	O	-
WPS FOLLOWED • SETTINGS ON WELDING EQUIPMENT • TRAVEL SPEED • SELECTED WELDING MATERIALS • SHIELDING GAS TYPE/FLOW RATE • PREHEAT APPLIED • INTERPASS TEMPERATURE MAINTAINED (MIN./MAX.) • PROPER POSITION (F, V, H, OH)	O	O	-
WELDING TECHNIQUES • INTERPASS AND FINAL CLEANING • EACH PASS WITHIN PROFILE LIMITATIONS • EACH PASS MEETS QUALITY REQUIREMENTS	O	O	-

TABLE N5.4-3
INSPECTION TASKS AFTER WELDING

INSPECTION TASKS AFTER WELDING	QC	QA	NOT APPLICABLE
WELDS CLEANED	O	O	-
SIZE, LENGTH AND LOCATION OF WELDS	P	P	-
WELDS MEET VISUAL ACCEPTANCE CRITERIA • CRACK PROHIBITION • WELD/BASE-METAL FUSION • CRATER CROSS SECTION • WELD PROFILES • WELD SIZE • UNDERCUT • POROSITY	P	P	-
ARC STRIKES	P	P	-
K-AREA[1]	P	P	-
BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	P	P	-
REPAIR ACTIVITIES	P	P	-
DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	P	P	-

[1]WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OF STIFFENERS HAS BEEN PERFORMED IN THE K-AREA, VISUALLY INSPECT THE WEB K-AREA FOR CRACKS WITHIN 3 IN. (75MM) OF THE WELD.

TABLE N5.6-1
INSPECTION TASKS PRIOR TO BOLTING

INSPECTION TASKS PRIOR TO BOLTING	QC	QA	NOT APPLICABLE
MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS	O	P	-
FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	O	O	-
PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE)	O	O	-
PROPER BOLTING PROCEDURE SELECTED FOR JOINT DETAIL	O	O	-
CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS	O	O	-
PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED	P	O	-
PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTNER COMPONENTS	O	O	-

TABLE N5.6-2
INSPECTION TASKS DURING BOLTING

INSPECTION TASKS DURING BOLTING	QC	QA	NOT APPLICABLE
FASTENERS ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED	O	O	-
JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION	O	O	-
FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	O	O	-
FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES	O	O	-

TABLE N5.6-3
INSPECTION TASKS AFTER BOLTING

INSPECTION TASKS AFTER BOLTING	QC	QA	NOT APPLICABLE
FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	O	O	-

O - OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS.

P - PERFORM THESE TASKS FOR EACH WELDED JOINT OR MEMBER.

SPECIAL INSPECTION (CONT.)

DESIGN CRITERIA		
CODE: 2014 OHIO BUILDING CODE THE STRUCTURE IS DESIGNED FOR THE FOLLOWING LIVE LOADS, IN ADDITION TO THE LATERAL LOADS, SUPER-IMPOSED DEAD LOADS, & SELF WEIGHT OF THE STRUCTURE, WHERE APPLICABLE LIVE LOADS ARE REDUCED IN ACCORDANCE WITH THE PROVISIONS OF THE BUILDING CODE. A. AMERICAN CONCRETE INSTITUTE BUILDING CODE (ACI-318). B. MANUAL OF STEEL CONSTRUCTION BY AMERICAN INSTITUTE OF STEEL CONSTRUCTION (LATEST EDITION). C. LATEST MASONRY STANDARDS JOINT COMMITTEE (MSJC) BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (TMS 402/ACI 530/ASCE 5) AND SPECIFICATIONS FOR MASONRY STRUCTURES (TMS 602/ACI 530.1/ASCE 6) D. AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (AITC) STANDARDS AND SPECIFICATIONS. E. NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (NDS) AS PUBLISHED BY AMERICAN FOREST AND PAPER ASSOCIATION.		
		CODE REFERENCE
BUILDING OCCUPANCY CATEGORY	II	IBC-Table 1604.5 ASCE Table 1.5-1

SNOW LOADS/ROOF LIVE LOADS		
SNOW CRITERIA		CODE REFERENCE
GROUND SNOW LOAD	Pg = 20 PSF	IBC FIG. 1608.2 ASCE Fig. 7-1
FLAT ROOF SNOW LOAD	Pf = 20 PSF (MINIMUM)	ASCE Sec. 7.3
EXPOSURE FACTOR	Ce = 1.0	ASCE Table 7-2
IMPORTANCE FACTOR	I = 1.0	ASCE Table 1.5-2
THERMAL FACTOR	Ct = 1.0	ASCE Table 7-3
ROOF LIVE LOADS	Lr = 20 PSF	ASCE Table 4-1
NOTE: SNOW LOADS ADJACENT VERTICAL PROJECTIONS, ON LOWER ROOFS, ADJACENT TO HIGH ROOFS, ON SLOPED ROOFS ARE INCREASED FOR THE EFFECT OR DRIFTING		

WIND LOADS		
WIND CRITERIA		CODE REFERENCE
BASIC WIND SPEED (3 SEC. GUST)	V = 115 MPH, V = 89 MPH ALLOWABLE	ASCE FIG. 26.5-1A, 26.5-1B, 26.5-1C
RISK CATEGORY	II	ASCE Table 1.5-1
EXPOSURE CATEGORY	B	ASCE Sec. 26.7.3
INTERNAL PRESSURE COEFFICIENT	± 0.18 (ENCLOSED)	ASCE TABLE 26.11-1
MWFRS ANALYSIS PROCEDURE	DIRECTIONAL PROCEDURE	ASCE CHAP. 27
COMPONENTS AND CLADDING	± 33 PSF MINIMUM ULTIMATE AND PER CODE REQUIREMENTS BASED ON ABOVE INFORMATION	ASCE Sec. 30.2.2

SEISMIC LOADS		
SEISMIC CRITERIA		CODE REFERENCE
SEISMIC RISK CATEGORY	II	ASCE Table 1.5-1
SEISMIC IMPORTANCE FACTOR	I = 1.0	ASCE Table 1.5-2
-0.2 SEC MAPPED SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING) Ss	Ss = .142	ASCE Sec. 11.4
-1.0 SEC MAPPED SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING) S1	S1 = .075	ASCE Sec. 11.4
SHORT PERIOR SPECTRAL RESPONSE ACCELERATION	Sds = .151	ASCE Sec. 11.4-3
1.0 SEC PERIOD SPECTRAL RESPONSE ACCELERATION	Sd1 = .121	ASCE Sec. 11.4-4
SOIL SITE CLASS	D	ASCE Sec. 11.4.2
SEISMIC DESIGN CATEGORY	B	ASCE Sec. 11.6
SEISMIC FORCE RESISTING SYSTEM	STEEL NOT SPECIFICALLY DETAILED FOR SEISMIC	ASCE Table 12.2-1
RESPONSE MODIFICATION FACTOR	R = 3.0	ASCE Table 12.2-1
DEFLECTION AMPLIFICATION FACTOR	Cd = 3.0	ASCE Table 12.2-1
ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE	ASCE Sec. 12.8

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KEY PLAN

OWNER

Hamtramck Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Community Center

11350 Charest St.
Hamtramck, MI 48212

PROJECT NO.

22-106B

ISSUES / REVISIONS

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

DRAWN BY

CHECKED BY
ACS

APPROVED BY
MAM

SHEET NAME
GENERAL NOTES

SHEET NO.
S4-00

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	2-WAY	VALVE – 2 WAY CONTROL VALVE
	GUARD FOR STAT OR SENSOR	3-WAY	VALVE – 3 WAY CONTROL VALVE
H	HUMIDISTAT OR HUMDITY 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
HB	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)
0.5	VALVE – COMBINATION BALANCE & FLOW MEASURING (i.e. BALANCE VALVE TO 0.5 GPM)
	VALVE – CHECK
	VALVE – SPRING CHECK
	VALVE – GAS (MANUAL)
	VALVE – GLOBE
	VALVE – ISOLATION
	VALVE – NEEDLE
	VALVE – OS&Y
	VALVE – PLUG
	VALVE – PRESSURE REGULATING
	VALVE – PRESSURE REDUCING
	VALVE – PRESSURE RELIEF
	VALVE – PRESSURE & TEMPERATURE RELIEF
VTR	VENT THROUGH ROOF
WH	WALL HYDRANT

DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
1U–101	AIR TERMINAL UNIT
1H–101	AIR TERMINAL UNIT WITH HEATING COIL
VTU–101	VENTURI AIR TERMINAL UNIT
VTU–101	VENTURI AIR TERMINAL UNIT WITH HEATING COIL
	DAMPER – HORIZONTAL FIRE (EXISTING, NEW)
	DAMPER – HORIZONTAL FIRE / SMOKE (EXISTING, NEW)
	DAMPER – SMOKE (EXISTING, NEW)
	DAMPER – VERTICAL FIRE (EXISTING, NEW)
	DAMPER – VERTICAL FIRE / SMOKE (EXISTING, NEW)
BDD	DAMPER – BACK DRAFT
M	DAMPER – MOTORIZED
	DAMPER – VOLUME (MANUALLY ADJUSTABLE)
	DIFFUSER – BLANK OFF
	DIFFUSER – LINEAR SLOT
	DIFFUSER – SQUARE OR RECTANGULAR
	DUCT CROSS SECTION – SUPPLY
	DUCT CROSS SECTION – RETURN
	DUCT CROSS SECTION – EXHAUST
	DUCT – FLEXIBLE CONNECTION
1000	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
	VALVE – OS&Y HORIZONTAL STEM
	VALVE – OS&Y VERTICAL STEM

MECHANICAL DRAWING INDEX

STANDARD METHODS OF NOTATION

S–1 10# 350–4	SUPPLY DIFFUSER WITH SCHEDULE TAG "1", 10" DIAMETER NECK SIZE 350 CFM TYPICAL FOR 4
R–1 22x22 640–2	RETURN REGISTER WITH SCHEDULE TAG "1", 22"x 22" NECK SIZE 640 CFM TYPICAL FOR 2 EXHAUST REGISTER E DESIGNATION SIMILAR.
1U–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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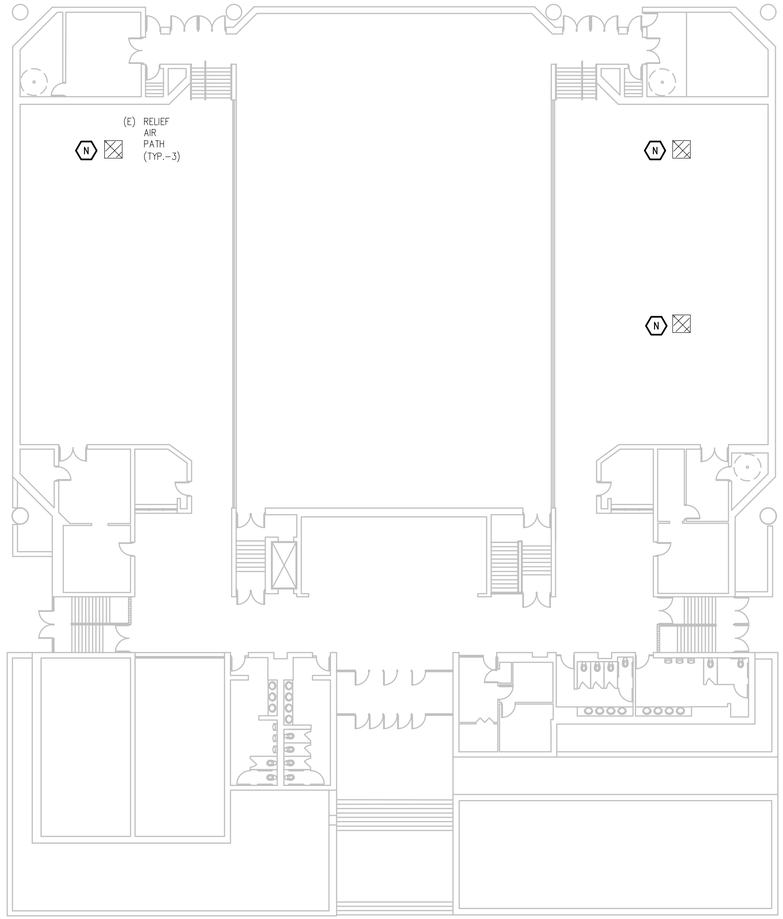
SHEET NAME

MECHANICAL STANDARDS AND DRAWING INDEX

SHEET NO.

M0-01

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. PROVIDE PRE-DEMO AIR FLOW READINGS AT AIR HANDLING UNIT. REMOVE AIR HANDLING UNIT, ASSOCIATED VERTICAL SUPPLY AND RETURN DUCTWORK, OUTDOOR AIR DUCTWORK, MIXED AIR DAMPERS AND ASSOCIATED CONTROLS. PREPARE EXISTING HORIZONTAL DUCTWORK ABOVE FOR NEW WORK.

B. REMOVE 3-WAY PNEUMATIC MIXING VALVE AND ASSOCIATED HOT WATER HEATING SUPPLY/RETURN BRANCH PIPING BACK TO MAINS. PREPARE HOT WATER HEATING PIPING MAINS FOR NEW CONNECTIONS.

C. PROVIDE PRE-DEMO WATERFLOW READINGS AT PUMP PRIOR TO REMOVAL. REMOVE INLINE CIRCULATING PUMP AND PIPING DOWNSTREAM OF PUMP COMPLETE. PREPARE PIPING FOR NEW CONNECTIONS.

D. REMOVE 80 TON AIR COOLED CONDENSER AND ASSOCIATED REFRIGERANT PIPING COMPLETE.

E. REMOVE 30 TON AIR COOLED CONDENSER AND ASSOCIATED REFRIGERANT PIPING COMPLETE.

F. REMOVE 20 TON AIR COOLED CONDENSER AND ASSOCIATED REFRIGERANT PIPING COMPLETE..

G. CAREFULLY REMOVE AND SALVAGE LOUVER TO FACILITATE REMOVAL & REPLACEMENT OF AIR HANDLING UNIT. PREPARE FOR RE-INSTALLATION OF LOUVER. REFER TO ARCHITECTURAL DRAWINGS.

H. REMOVE OUTDOOR AIR DUCTWORK AND ASSOCIATED DAMPERS, ACTUATORS.

I. PROVIDE PRE-DEMOLITION AIR FLOW READINGS FOR UTILITY EXHAUST FAN. DISCONNECT AND REMOVE UTILITY EXHAUST FAN. PREPARE DUCT CONNECTIONS FOR NEW WORK.

J. REMOVE DAMAGED EXHAUST BREECHING. PREPARE FOR NEW WORK.

K. REMOVE SHUTOFF VALVE. PREPARE PIPING FOR NEW WORK.

L. REFER TO ARCHITECTURAL DRAWINGS FOR NEW SEVEN (7) FOOT WIDE OPENING IN WALL.

M. REMOVE EXISTING REFRIGERANT PIPING COMPLETE.

N. REMOVE DAMPER AND ACTUATOR LOCATED HIGH UP IN CEILING.

FIRST FLOOR MECHANICAL DEMOLITION PLAN

SCALE: 1/16" = 1' - 0"

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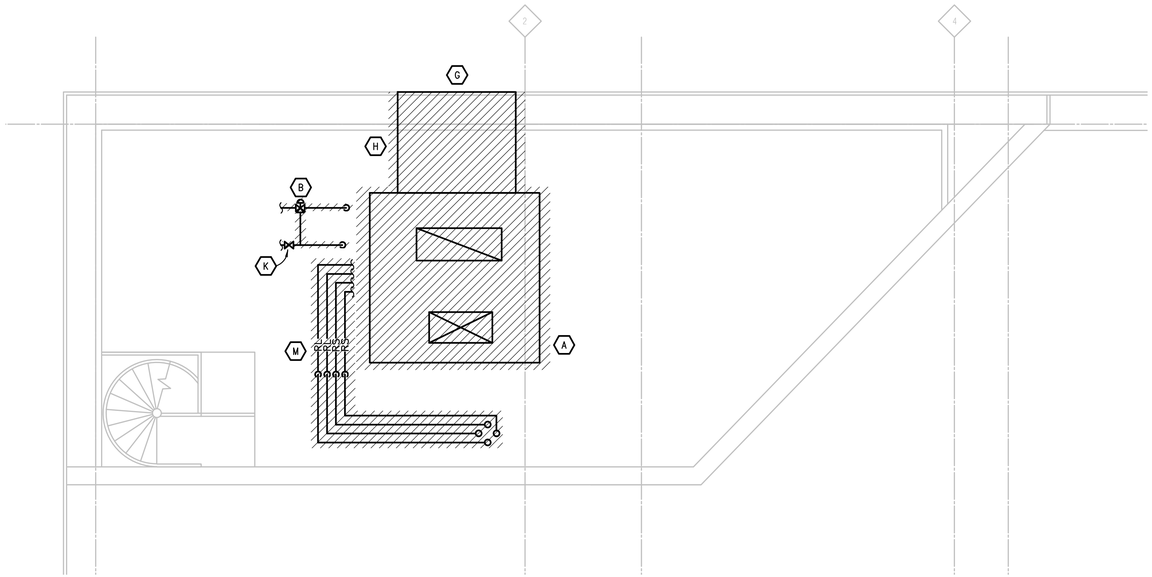
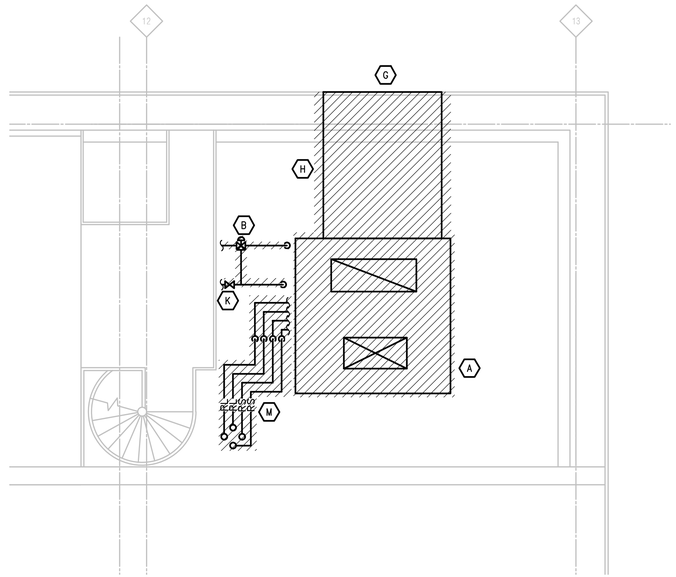
SHEET NAME
FIRST FLOOR MECHANICAL DEMOLITION PLAN

SHEET NO.
MD1-10

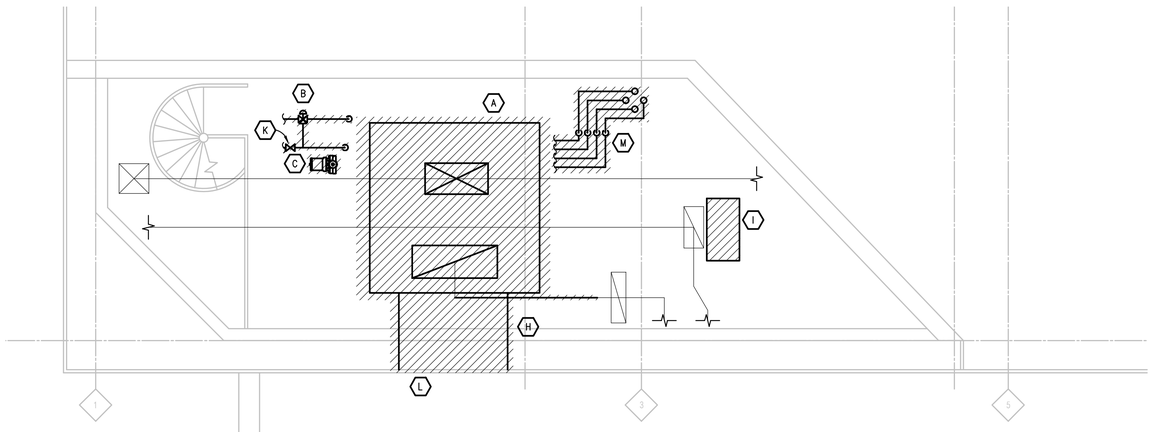
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



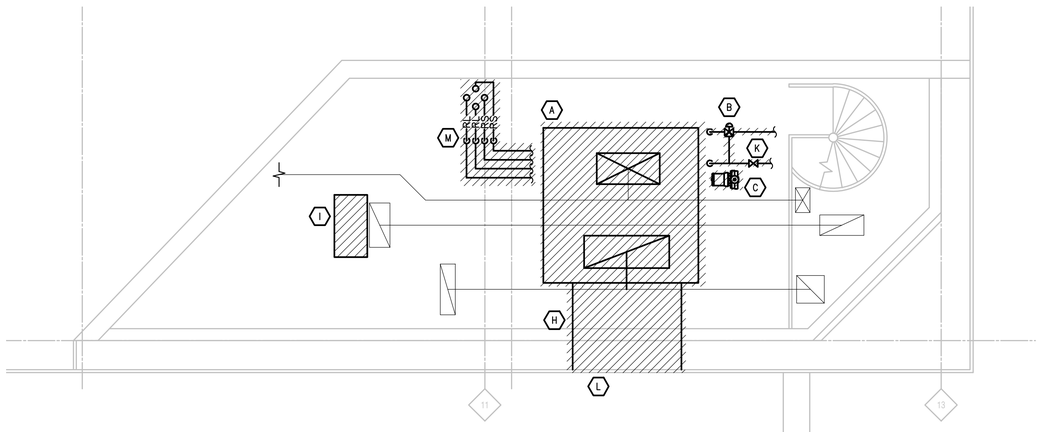
NORTHEAST MEZZANINE MECHANICAL DEMOLITION PLAN
SCALE: 1/4" = 1' - 0"



SOUTHEAST MEZZANINE MECHANICAL DEMOLITION PLAN
SCALE: 1/4" = 1' - 0"



NORTHWEST MEZZANINE MECHANICAL DEMOLITION PLAN
SCALE: 1/4" = 1' - 0"



SOUTHWEST MEZZANINE MECHANICAL DEMOLITION PLAN
SCALE: 1/4" = 1' - 0"

GENERAL AND KEYED NOTES: SEE SHEET MD2-10

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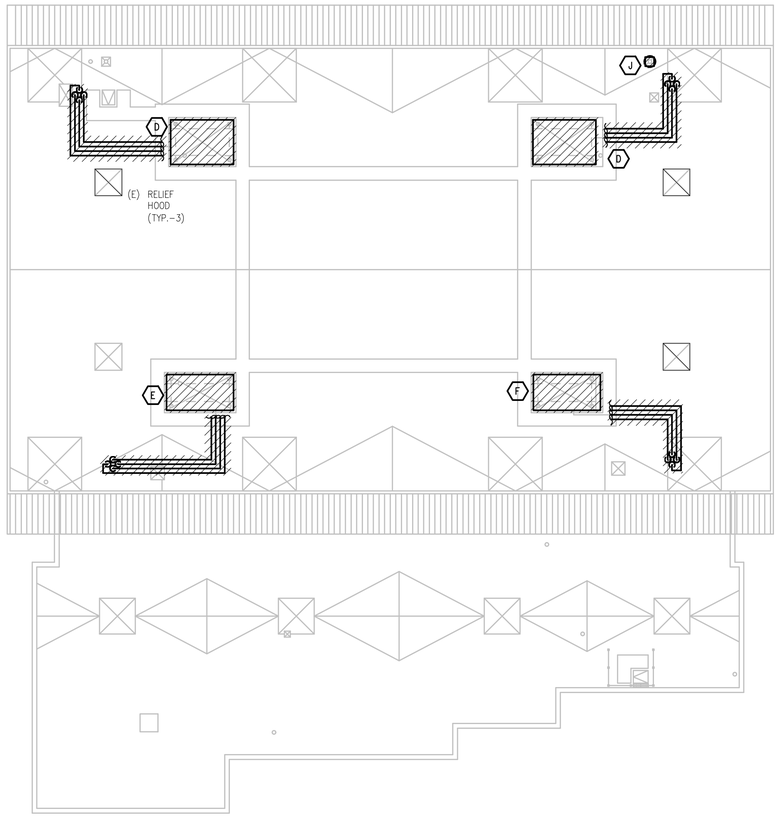
SHEET NAME
MEZZANINE MECHANICAL DEMOLITION PLAN

SHEET NO.
MD1-20

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



ROOF MECHANICAL DEMOLITION PLAN
SCALE: 1/16" = 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.
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3. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
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(#) DEMOLITION KEY NOTES:

A. PROVIDE PRE-DEMO AIR FLOW READINGS AT AIR HANDLING UNIT. REMOVE AIR HANDLING UNIT, ASSOCIATED VERTICAL SUPPLY AND RETURN DUCTWORK, OUTDOOR AIR DUCTWORK, MIXED AIR DAMPERS AND ASSOCIATED CONTROLS. PREPARE EXISTING HORIZONTAL DUCTWORK ABOVE FOR NEW WORK.

B. REMOVE 3-WAY PNEUMATIC MIXING VALVE AND ASSOCIATED HOT WATER HEATING SUPPLY/RETURN BRANCH PIPING BACK TO MAINS. PREPARE HOT WATER HEATING PIPING MAINS FOR NEW CONNECTIONS.

C. PROVIDE PRE-DEMO WATERFLOW READINGS AT PUMP PRIOR TO REMOVAL. REMOVE INLINE CIRCULATING PUMP AND PIPING DOWNSTREAM OF PUMP COMPLETE. PREPARE PIPING FOR NEW CONNECTIONS.

D. REMOVE 80 TON AIR COOLED CONDENSER AND ASSOCIATED REFRIGERANT PIPING COMPLETE.

E. REMOVE 30 TON AIR COOLED CONDENSER AND ASSOCIATED REFRIGERANT PIPING COMPLETE.

F. REMOVE 20 TON AIR COOLED CONDENSER AND ASSOCIATED REFRIGERANT PIPING COMPLETE..

G. CAREFULLY REMOVE AND SALVAGE LOUVER TO FACILITATE REMOVAL & REPLACEMENT OF AIR HANDLING UNIT. PREPARE FOR RE-INSTALLATION OF LOUVER. REFER TO ARCHITECTURAL DRAWINGS.

H. REMOVE OUTDOOR AIR DUCTWORK AND ASSOCIATED DAMPERS, ACTUATORS.

I. PROVIDE PRE-DEMOLITION AIR FLOW READINGS FOR UTILITY EXHAUST FAN. DISCONNECT AND REMOVE UTILITY EXHAUST FAN. PREPARE DUCT CONNECTIONS FOR NEW WORK.

J. REMOVE DAMAGED EXHAUST BREECHING. PREPARE FOR NEW WORK.

K. REMOVE SHUTOFF VALVE. PREPARE PIPING FOR NEW WORK.

L. REFER TO ARCHITECTURAL DRAWINGS FOR NEW SEVEN (7) FOOT WIDE OPENING IN WALL.

M. REMOVE EXISTING REFRIGERANT PIPING COMPLETE.

N. REMOVE DAMPER AND ACTUATOR LOCATED HIGH UP IN CEILING.

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SHEET NAME
ROOF MECHANICAL DEMOLITION PLAN

SHEET NO.
MD1-30

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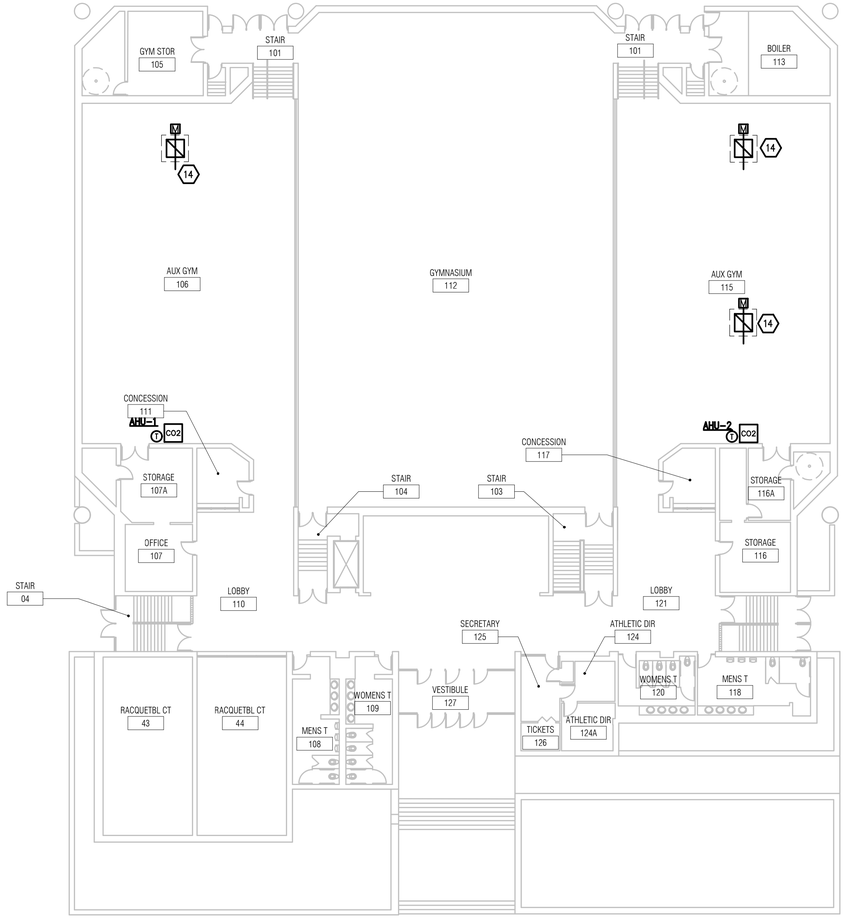

FIRST FLOOR MECHANICAL PLAN

SCALE: 1/16" = 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 , 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. RE-USE EXISTING PATE RAILS FOR NEW PIPING SUPPORT.
2. PROVIDE BOILER EXHAUST BREECHING. VERIFY SIZE IN FIELD.
3. RE-INSTALL SALVAGED LOUVER.
4. CONNECT NEW 2 HOT WATER HEATING SUPPLY & RETURN (HWHS/R) PIPING FOR AHU COIL TO EXISTING MAINS. PROVIDE NEW 3-WAY HEATING VALVE, PIPING AND COIL PUMPS. REFER TO DETAIL.
5. CONNECT NEW 2 1/2 HWHS/R PIPING FOR AHU COIL TO EXISTING MAINS. PROVIDE NEW 3-WAY HEATING VALVE AND PIPING. REFER TO DETAIL.
6. NEW DOUBLE DOORS. REFER TO ARCHITECTURAL FOR DETAILS AND LOCATION.
7. EXISTING OUTSIDE AIR LOUVER TO REMAIN.
8. RECONNECT EXISTING SA/RA DUCTWORK TO NEW AHU. PROVIDE ALL REQUIRED TRANSITIONS AND OFFSETS. PROVIDE FLEXIBLE CONNECTORS.
9. RECONNECT EXISTING EA DUCTWORK TO NEW FAN. PROVIDE FLEXIBLE CONNECTORS AND ALL REQUIRED DUCTWORK TRANSITIONS. PROVIDE NEW MOTORIZED DAMPER ON EF DISCHARGE.
10. REUSE EXISTING EQUIPMENT RAILS. PROVIDE SUPPLEMENTAL SUPPORT FRAMING AS REQUIRED FOR NEW CONDENSING UNIT.
11. PROVIDE NEW PIPE PORTAL FOR REFRIGERANT PIPING.
12. PIPE AHU CONDENSATE. CONNECT TO EXISTING DRAIN PATH. REFER TO DETAIL.
13. CONNECT NEW OUTDOOR DUCT INTO EXISTING OUTDOOR AIR PLENUM.
14. PROVIDE NEW DAMPER AND MOTORIZED ACTUATOR. USE 48x48 FOR DAMPER SIZE FOR BIDDING PURPOSES ONLY. FIELD VERIFY DAMPER SIZE HIGH UP IN GYM CEILING.
15. REFER TO ARCHITECTURAL FOR PIPE PENETRATION DETAIL.

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PBA Project No: 2022.0017

KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Community Center

11350 Charest St.
Hamtramck, MI 48212

PROJECT NO.

22-106B

ISSUES / REVISIONS

OWNER REVIEW	03/22/2022
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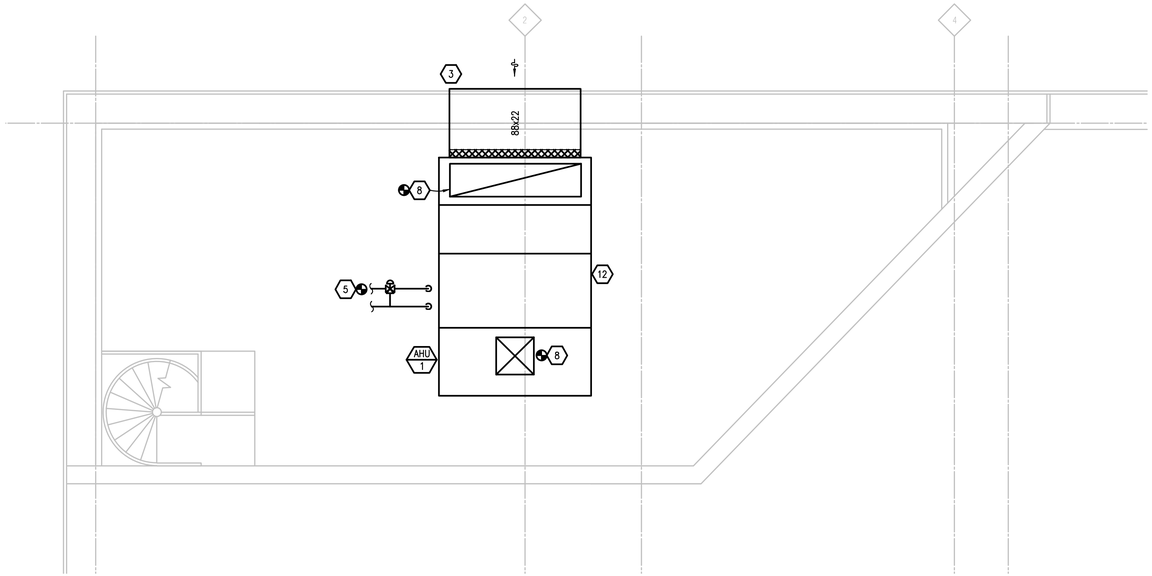
SHEET NAME

FIRST FLOOR MECHANICAL PLAN

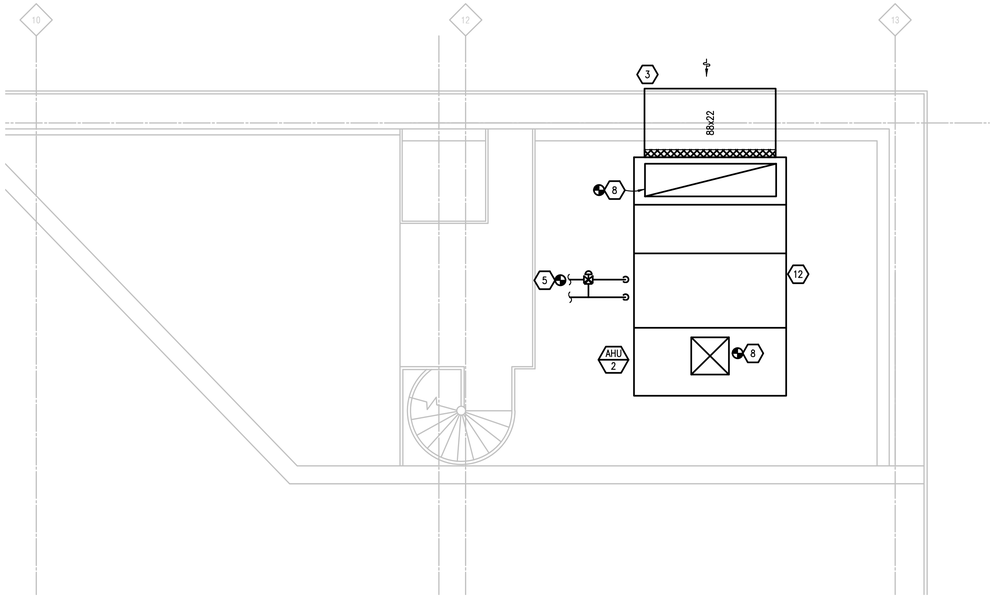
SHEET NO.

M3-10

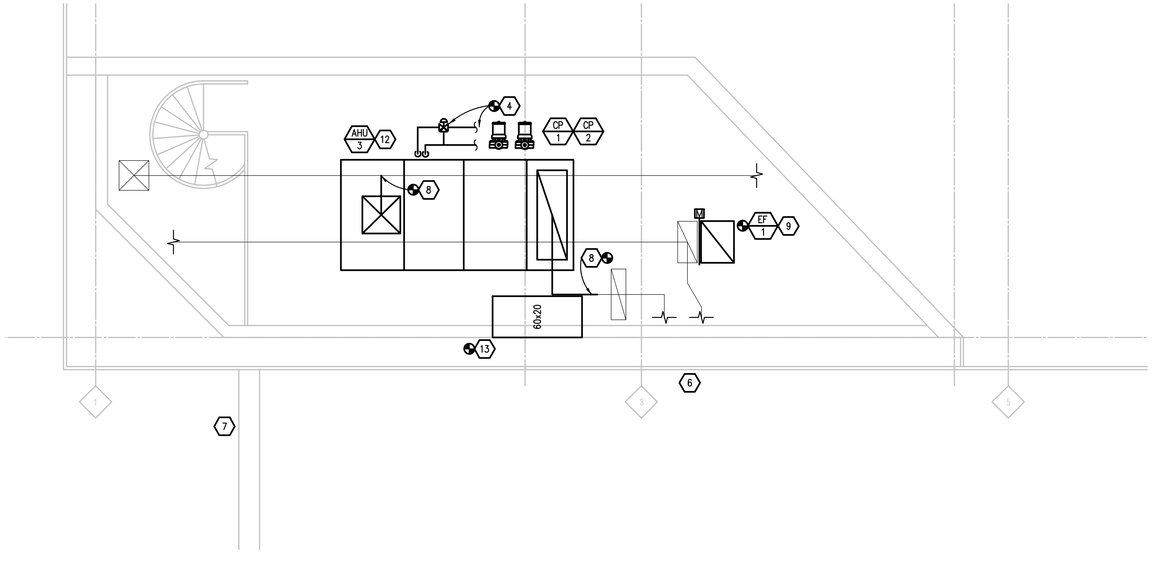
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



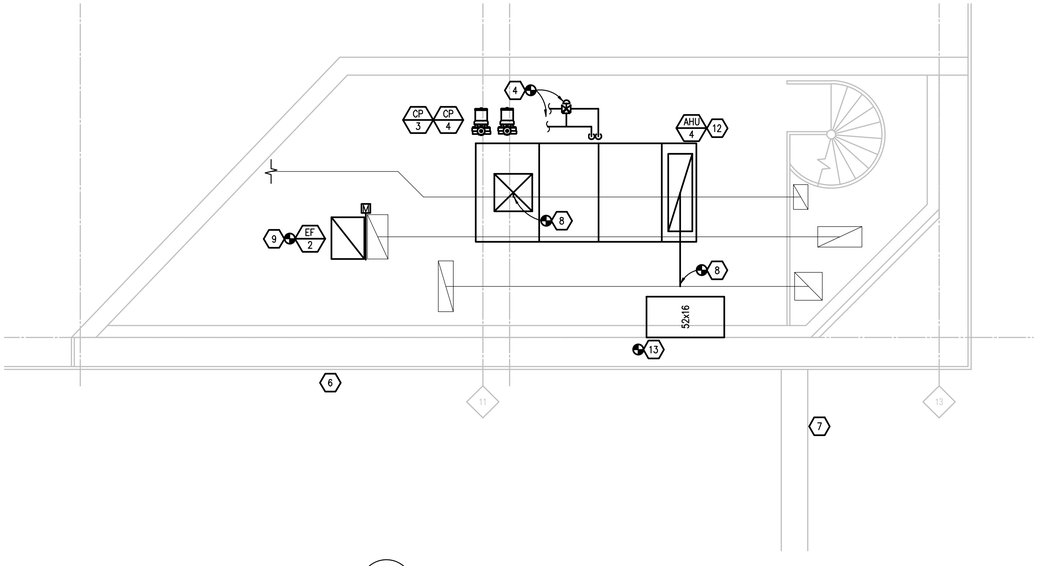
NORTHEAST MEZZANINE FLOOR MECHANICAL PLAN
SCALE: 1/4" = 1' - 0"



SOUTHEAST MEZZANINE FLOOR MECHANICAL PLAN
SCALE: 1/4" = 1' - 0"



NORTHWEST MEZZANINE FLOOR MECHANICAL PLAN
SCALE: 1/4" = 1' - 0"



SOUTHWEST MEZZANINE FLOOR MECHANICAL PLAN
SCALE: 1/4" = 1' - 0"

GENERAL AND KEYED NOTES: SEE SHEET M3-10

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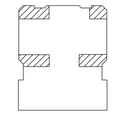
KEY PLAN



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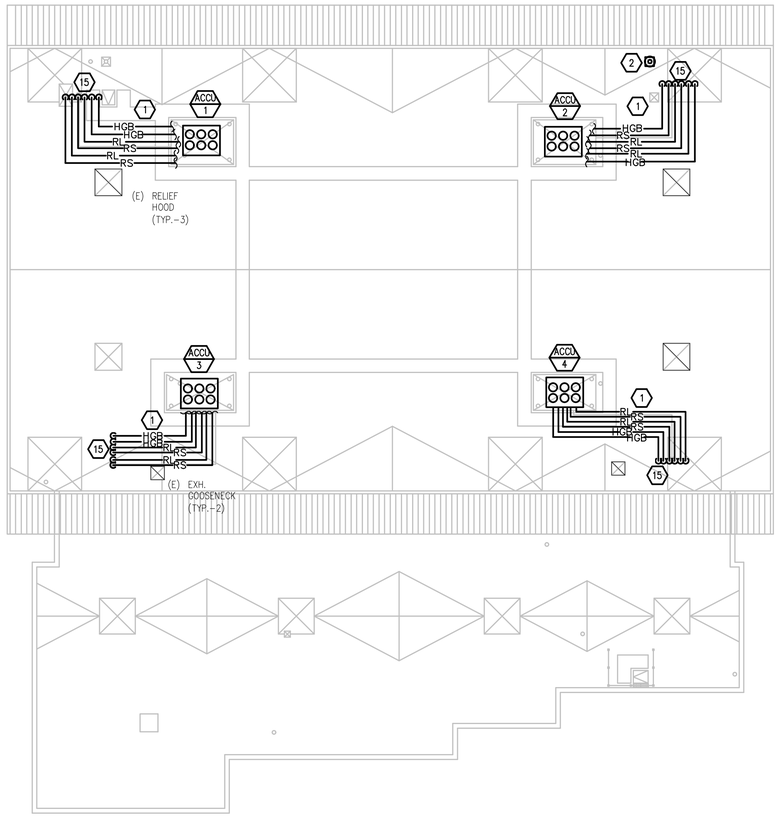
SHEET NAME
MEZZANINE MECHANICAL PLAN

SHEET NO.
M3-20

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



ROOF MECHANICAL PLAN
SCALE: 1/16" = 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 , 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. RE-USE EXISTING PATE RAILS FOR NEW PIPING SUPPORT.
2. PROVIDE BOILER EXHAUST BREECHING. VERIFY SIZE IN FIELD.
3. RE-INSTALL SALVAGED LOUVER.
4. CONNECT NEW 2 HOT WATER HEATING SUPPLY & RETURN (HWHS/R) PIPING FOR AHU COIL TO EXISTING MAINS. PROVIDE NEW 3-WAY HEATING VALVE, PIPING AND COIL PUMPS. REFER TO DETAIL.
5. CONNECT NEW 2 1/2 HWHS/R PIPING FOR AHU COIL TO EXISTING MAINS. PROVIDE NEW 3-WAY HEATING VALVE AND PIPING. REFER TO DETAIL.
6. NEW DOUBLE DOORS. REFER TO ARCHITECTURAL FOR DETAILS AND LOCATION.
7. EXISTING OUTSIDE AIR LOUVER TO REMAIN.
8. RECONNECT EXISTING SA/RA DUCTWORK TO NEW AHU. PROVIDE ALL REQUIRED TRANSITIONS AND OFFSETS. PROVIDE FLEXIBLE CONNECTORS.
9. RECONNECT EXISTING EA DUCTWORK TO NEW FAN. PROVIDE FLEXIBLE CONNECTORS AND ALL REQUIRED DUCTWORK TRANSITIONS. PROVIDE NEW MOTORIZED DAMPER ON EF DISCHARGE.
10. REUSE EXISTING EQUIPMENT RAILS. PROVIDE SUPPLEMENTAL SUPPORT FRAMING AS REQUIRED FOR NEW CONDENSING UNIT.
11. PROVIDE NEW PIPE PORTAL FOR REFRIGERANT PIPING.
12. PIPE AHU CONDENSATE. CONNECT TO EXISTING DRAIN PATH. REFER TO DETAIL.
13. CONNECT NEW OUTDOOR DUCT INTO EXISTING OUTDOOR AIR PLENUM.
14. PROVIDE NEW DAMPER AND MOTORIZED ACTUATOR. USE 48x48 FOR DAMPER SIZE FOR BIDDING PURPOSES ONLY. FIELD VERIFY DAMPER SIZE HIGH UP IN GYM CEILING.
15. REFER TO ARCHITECTURAL FOR PIPE PENETRATION DETAIL.

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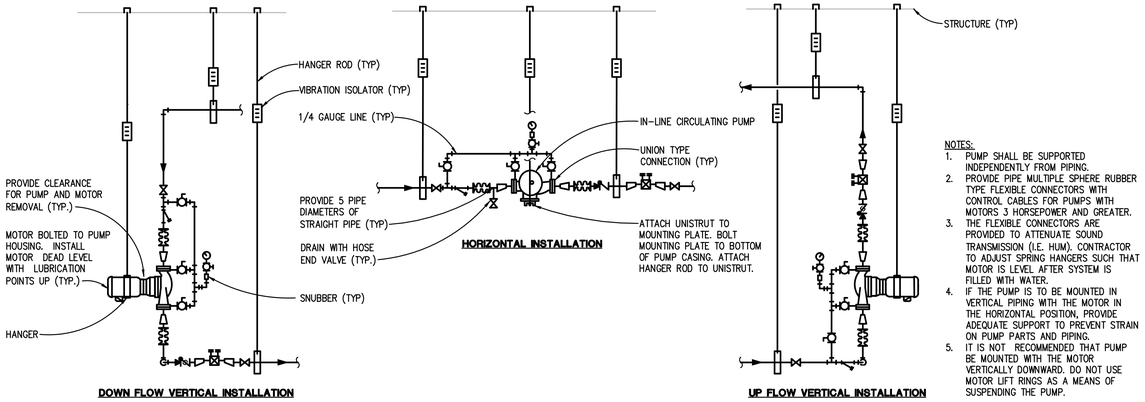
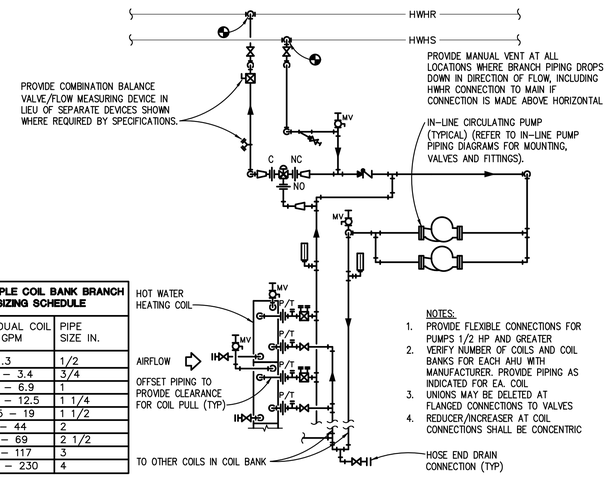
SHEET NAME
ROOF MECHANICAL PLAN

SHEET NO.
M3-30



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

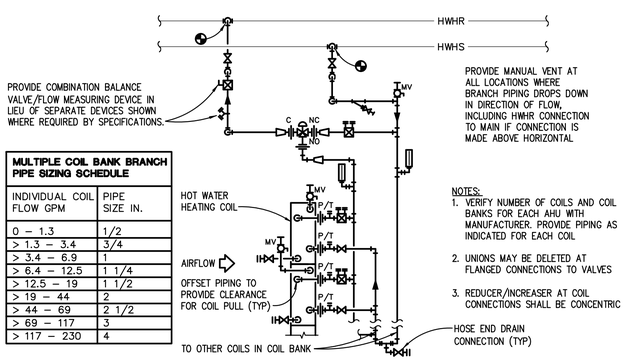
IN-LINE CLOSE COUPLED (BELL AND GOSSETT SERIES 80 AND 90) TYPE CIRCULATING PUMP PIPING DIAGRAM
NO SCALE



MULTIPLE COIL BANK BRANCH PIPE SIZING SCHEDULE	
INDIVIDUAL COIL FLOW GPM	PIPE SIZE IN.
0 – 1.3	1/2
> 1.3 – 3.4	3/4
> 3.4 – 6.9	1
> 6.4 – 12.5	1 1/4
> 12.5 – 19	1 1/2
> 19 – 44	2
> 44 – 69	2 1/2
> 69 – 117	3
> 117 – 230	4

NOTES:
1. PROVIDE FLEXIBLE CONNECTIONS FOR PUMPS 1/2 HP AND GREATER
2. VERIFY NUMBER OF COILS AND COIL BANKS FOR EACH AHU WITH MANUFACTURER. PROVIDE PIPING AS INDICATED FOR EA. COIL
3. UNIONS MAY BE DELETED AT FLANGED CONNECTIONS TO VALVES
4. REDUCER/INCREASER AT COIL CONNECTIONS SHALL BE CONCENTRIC

AHU HOT 3&4 WATER HEATING COIL PIPING DIAGRAM
NO SCALE



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> 12.5 – 19	1 1/2
> 19 – 44	2
> 44 – 69	2 1/2
> 69 – 117	3
> 117 – 230	4

NOTES:
1. VERIFY NUMBER OF COILS AND COIL BANKS FOR EACH AHU WITH MANUFACTURER. PROVIDE PIPING AS INDICATED FOR EACH COIL
2. UNIONS MAY BE DELETED AT FLANGED CONNECTIONS TO VALVES
3. REDUCER/INCREASER AT COIL CONNECTIONS SHALL BE CONCENTRIC

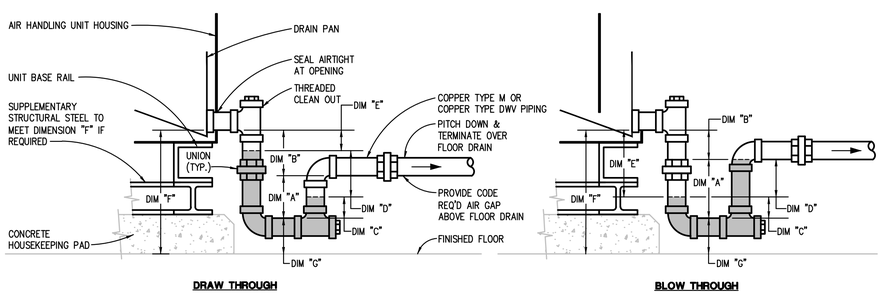
AHU HOT 1 & 2 WATER HEATING COIL PIPING DIAGRAM
NO SCALE

TRAP DIMENSION TABLE

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

NOTES: A. REFER TO AIR HANDLING UNIT SCHEDULE FOR (−) OR (+) STATIC PRESSURE AT DRAIN PAN.

B. 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



INDOOR AIR HANDLING UNIT CONDENSATE DRAIN PAN TRAP DETAIL
NO SCALE

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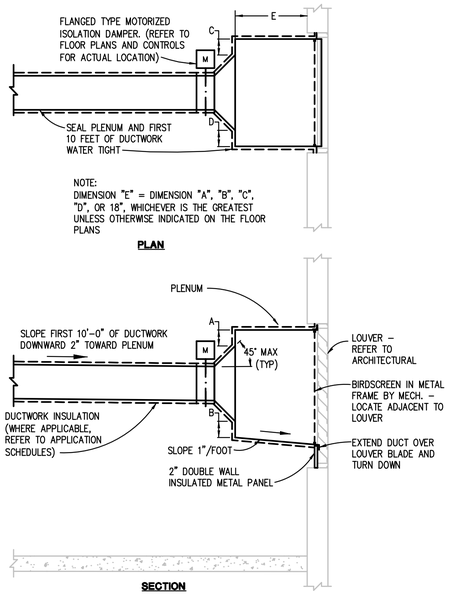
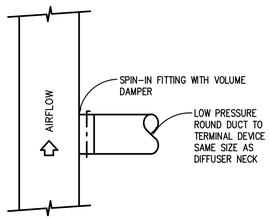
SHEET NAME
MECHANICAL DETAILS

SHEET NO.
M6-01

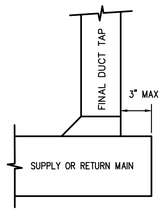


OUTDOOR AIR INTAKE OR EXHAUST/RELIEF PLENUM DETAIL

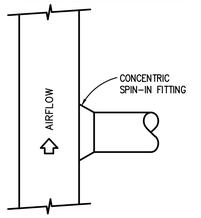
NO SCALE



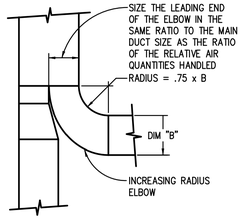
LOW PRESSURE INLET/OUTLET TO/FROM DIFFUSER, REGISTER OR GRILLE



LOW PRESSURE END OF RUN

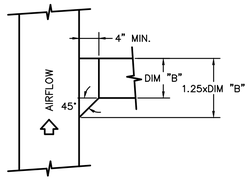


RECTANGULAR TO ROUND DUCT

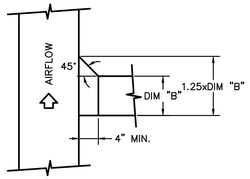


SUPPLY, RETURN OR EXHAUST DUCT

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



SUPPLY DUCT



RETURN OR EXHAUST DUCT

RECTANGULAR DUCT BRANCH TAKE-OFF DETAILS

NO SCALE

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MECHANICAL DETAILS

SHEET NO.
M6-02

DUCT SYSTEM INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD APPLIED JACKET MATERIAL		
	FIBERGLASS BLANKET 0.75 LB/CU FT	FIBERGLASS BLANKET 1.0 LB/CU FT	FIBERGLASS BOARD 2.25 LB/CU FT	FIBERGLASS BOARD 6.0 LB/CU FT	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE RATED BLANKET	2-HOUR FIRE RATED BLANKET	ALUMINUM	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	KEYED NOTES
DUCT SYSTEMS LOCATED INDOORS										
SUPPLY AIR, EXCEPT AS NOTED BELOW		1.5								A, E
RECTANGULAR SUPPLY AIR IN MECHANICAL ROOMS			1.5							
ROUND & FLAT OVAL SUPPLY AIR IN MECHANICAL ROOMS		1.5								
RECTANGULAR RETURN AIR IN MECHANICAL EQUIPMENT ROOMS			1.5							
ROUND RETURN AIR IN MECHANICAL ROOMS		1.5								
OUTSIDE AIR AND MIXED AIR, EXCEPT AS NOTED BELOW		1.5								
RECTANGULAR OUTSIDE AIR AND MIXED AIR IN MECHANICAL ROOMS			1.5							
ROUND OUTSIDE AIR AND MIXED AIR IN MECHANICAL ROOMS		1.5								
OUTSIDE AIR INTAKE, RELIEF AIR AND EXHAUST AIR PLENUMS ADJACENT TO EXTERIOR LOUVERS			1.5							
EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, EXCEPT AS NOTED BELOW		1.5								
RECTANGULAR EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, IN MECHANICAL ROOMS			1.5							
ROUND & FLAT OVAL EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, IN MECHANICAL ROOMS		1.5								
LOCKER ROOM AND WET AREA EXHAUST BETWEEN EXHAUST GRILLE & CONNECTION TO GENERAL EXHAUST OR BETWEEN EXHAUST GRILLE AND PENETRATION OF BUILDING EXTERIOR		1.5								

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.

DUCT SYSTEM APPLICATION SCHEDULE

	DUCT MATERIAL																		
AIR SYSTEMS	G90 GALV. SHEET METAL	DOUBLE-WALL LINED G90 GALV. SHEET METAL (SOLID INNER WALL)	DOUBLE-WALL LINED G90 GALV. SHEET METAL (PERF. INNER WALL)	G90 GALV. SHEET METAL WITH 1-INCH LINING	GALVANNEALED SHEET METAL	ALUMINUM	TYPE 304 STAINLESS STEEL	TYPE 316 STAINLESS STEEL	PVC COATED GALV. SHEET METAL (4X1)	PVC COATED GALV. SHEET METAL (1X4)	PVC COATED GALV. SHEET METAL (4X4)	16 GA. CARBON STEEL	ZERO-CLEARANCE PREFABRICATED RANGE HOOD EXHAUST DUCT	FABRIC	DESIGN PRESSURE CLASS (INCHES WG)	SEAL CLASS	MAX. ALLOWABLE LEAKAGE RATE (PERCENT)	KEYED NOTES
SUPPLY AIR WITHOUT TERMINAL UNITS	X														+2	A	5	
SUPPLY AIR UPSTREAM OF TERMINAL UNITS	X														+6	A	5	
SUPPLY AIR DOWNSTREAM OF TERMINAL UNITS	X														+2	A	5	
RETURN AIR WITHOUT TERMINAL UNITS	X														-2	A	5	
RETURN AIR UPSTREAM OF TERMINAL UNITS	X														-2	A	5	
LOCKER ROOM AND WET AREA EXHAUST						X	X								-2	A	5	
AIR TRANSFER DUCT				X											+2	A	5	
RELIEF AIR DOWNSTREAM OF FANS	X														+6	A	5	
OUTSIDE AIR AND MIXED AIR DUCT	X														-6	A	5	
OUTSIDE AIR, RELIEF AIR AND EXHAUST AIR PLENUMS ADJACENT TO EXTERIOR LOUVERS		X													+/-6	A	5	

GENERAL NOTES

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

KEYED NOTES

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

ABOVEGROUND HVAC PIPING & VALVE APPLICATION SCHEDULE

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

GENERAL NOTES

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

KEYED NOTES

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

ABOVEGROUND HVAC PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD-APPLIED JACKET MATERIAL						
	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	STAINLESS STEEL	PVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
INDOOR PIPE SYSTEM AND SIZE (INCHES)														
HEATING HOT WATER SUPPLY & RETURN 200 DEG F AND LOWER														
NPS 1-1/4 AND SMALLER		1.5						X		X				A
NPS 1-1/2 AND LARGER		2						X		X				A
REFRIGERANT SUCTION & HOT GAS (RIGID COPPER)														
NPS 6 AND SMALLER	1	1		1	1	1		X		X				
NPS 8 AND LARGER	1.5	1.5		1.5	1.5	1.5		X		X				
REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)	1							X		X				
OUTDOOR (ABOVEGROUND) AND TUNNEL PIPE SYSTEM AND SIZE (INCHES)														
REFRIGERANT SUCTION & HOT GAS (RIGID COPPER)	2.5	2.5						X			X			B
REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)	2							X						B

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

GENERAL NOTES

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

KEYED NOTES

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

SCHEDULES GENERAL NOTES:

TYPICAL FOR ALL SCHEDULE SHEETS:

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

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KEY PLAN

OWNER

Hamtramck
Public Schools

PROJECT NAME

HVAC Improvements
Phase 1
Community Center

11350 Charest St.
Hamtramck, MI 48212

PROJECT NO.

22-106B

ISSUES / REVISIONS

OWNER REVIEW	03/22/2022
Bidding - Construction	04/07/2022

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JPG

CHECKED BY

SVM

APPROVED BY

SVM

SHEET NAME

MECHANICAL SCHEDULES

SHEET NO.

M7-01

AIR HANDLING UNIT SUPPLY AIR FAN SCHEDULE PART 1

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	AIRFLOW CFM	MINIMUM OUTSIDE AIR FLOW CFM	E.S.P. IN. W.G.	SUCTION OR DISCHARGE S.P. IN. W.C. AT COOLING COIL DRAIN PAN	T.S.P. IN. W.G.	MINIMUM WHEEL DIAMETER INCHES	RPM	OUTLET VELOCITY FPM	FAN CLASS	HOT WATER COIL						DIRECT EXPANSION COIL							MOTOR				MODULATION/ CONTROL TYPE	ELECTRICAL			
												GPM	CAPACITY (MBH)	EWT/LWT (° F)	EAT/LAT (° F)	PRESSURE DROP (FT. of HD.)	AIR PRESSURE DROP (IN. WC.)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EAT DB/WB (° F)	LAT DB/WB (° F)	REFRIGERANT	NO. OF COILS	AIR PRESSURE DROP (IN. WC.)	BHP	HP	RPM	DRIVE TYPE		VOLTS	PHASE	SCCR KA (NOTE 5)	OPTIONS/ ACCESSORIES
AHU-1	AUX. GYM & MAIN GYM	CENTRIFUGAL	15000	6750	1.5	2.18	3.68	21.5	2547	2564	DWDI/2	45.10	904.75	180/140	30/85	8.50	0.33	677.47	461.48	82.3/67.4	54.2/52.9	R410A	2	1.14	17.38	20	1750	BELT	VAV/VFC	460	3		B
AHU-2	AUX. GYM & MAIN GYM	CENTRIFUGAL	15000	6750	1.5	2.18	3.68	21.5	2547	2564	DWDI/2	45.10	904.75	180/140	30/85	8.50	0.33	677.47	461.48	82.3/67.4	54.2/52.9	R410A	2	1.14	17.38	20	1750	BELT	VAV/VFC	460	3		B
AHU-3	LOBBY, OFFICES, LOCKER RMS	CENTRIFUGAL	10000	5500	1.5	2	3.5	19.7	2858	2123	DWDI/2	31.70	635.66	180/140	27/85	3.7	0.35	436.74	299.21	82.9/68.0	55.5/54.0	R410A	2	0.95	9.61	10	1750	BELT	VAV/VFC	460	3		B
AHU-4	LOBBY, OFFICES, LOCKER RMS	CENTRIFUGAL	6600	4000	1.5	1.97	3.47	15.75	3457	1859	DWDI/2	18.00	375.85	180/140	45/87	1.7	0.36	261.48	184.87	81.3/67.0	55.7/54.1	R410A	1	0.89	5.92	7.5	1750	BELT	VAV/VFC	460	3		B

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE TRANE 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. REFER TO AIR HANDLING UNIT FILTER SCHEDULE FOR AIR PRESSURE DROP TO BE USED FOR TOTAL STATIC PRESSURE CALCULATIONS.
5. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

AIR HANDLING UNIT SUPPLY AIR FAN SCHEDULE PART 2

MAXIMUM SOUND POWER LEVELS																						MODEL NUMBER	KEYED NOTES
UNIT DISCHARGE Lw BY OCTAVE BAND								UNIT RETURN 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)	63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)		
108	103	99	100	94	88	84	80	98	93	81	83	77	71	64	57	98	93	81	79	72	60	46	51	CAH032GDGM	
108	103	99	100	94	88	84	80	98	93	81	83	77	71	64	57	98	93	81	79	72	60	46	51	CAH032GDGM	
103	98	94	95	89	83	79	75	93	88	76	78	72	66	59	52	93	88	76	74	67	55	46	51	CAH022GDGM	
96	95	90	91	85	82	77	75	86	85	75	77	70	67	59	55	86	85	72	70	63	54	46	51	CAH014GDGM	

MODULAR AIR HANDLING UNIT COMPONENT SCHEDULE

UNIT IDENTIFICATION	POSITION NUMBER 1	POSITION NUMBER 2	POSITION NUMBER 2	POSITION NUMBER 3	POSITION NUMBER 4	POSITION NUMBER 5	MAXIMUM UNIT LENGTH	KEYED NOTES
AHU-1	MIXING BOX	FILTER	HWC	DXC	ACCESS	SUPPLY FAN	160"	
AHU-2	MIXING BOX	FILTER	HWC	DXC	ACCESS	SUPPLY FAN	160"	
AHU-3	MIXING BOX	FILTER	HWC	DXC	ACCESS	SUPPLY FAN	156"	
AHU-4	MIXING BOX	FILTER	HWC	DXC	ACCESS	SUPPLY FAN	148"	

GENERAL NOTES:
1. MODULES SELECTED BASED ON DAIKIN INDOOR MODULAR AIR HANDLING UNIT.
2. POSITION NUMBERS ARE INDICATED IN THE DIRECTION OF AIRFLOW FROM RETURN AIR INLET TO SUPPLY AIR DISCHARGE.

AIR-COOLED CONDENSING UNIT SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TOTAL CAPACITY MBH	MINIMUM EER	REFRIGERATION TYPE	NUMBER OF CIRCUITS	NUMBER OF CONTROL STAGES	CONDENSER		SUCTION TEMPERATURE °F	CONDENSER FAN		COMPRESSOR		MODULATION/ CONTROL TYPE	DIMENSIONS			WEIGHT (LBS.)	ELECTRICAL						MODEL NUMBER	KEYED NOTES
							DESIGN AMBIENT TEMPERATURE °F	MINIMUM AMBIENT TEMPERATURE °F		QUANTITY	HP EACH	NUMBER OF COMPRESSORS	TYPE OF COMPRESSOR		LENGTH IN.	WIDTH IN.	HEIGHT IN.		VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS/ ACCESSORIES		
ACCU-1	AHU-1	660	11	R-410A	2	4	95	40	46	6	area	4	SCROLL	MODULATING	80	99	73	2580	460	3	112	125		B	RCS062D	
ACCU-2	AHU-2	660	11	R-410A	2	4	95	40	46	6	area	4	SCROLL	MODULATING	80	99	73	2580	460	3	112	125		B	RCS062D	
ACCU-3	AHU-3	429	11	R-410A	2	4	95	40	44	4	area	4	SCROLL	MODULATING	80	99	55.5	2500	460	3	81	90		B	RCS040D	
ACCU-4	AHU-4	279	11	R-410A	2	4	95	40	44	2	area	3	SCROLL	MODULATING	58	99	55.5	1855	460	3	50	60		B	RCS025D	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE DAIKIN UNLESS OTHERWISE NOTED.
3. REFER TO AIR HANDLING UNIT DIRECT EXPANSION COOLING COIL SCHEDULE FOR ASSOCIATED COOLING COIL.
4. EFFICIENCY RATING SHALL BE IN ACCORDANCE WITH ARI-STANDARD 340/360-2004.

AIR HANDLING UNIT FILTER SCHEDULE

UNIT I.D.	SYSTEM SERVED	TYPE	AIRFLOW CFM	AIR PRESS. DROP		EFFICIENCIES		FILTER MEDIA					HOUSING				MODEL NO.	KEYED NOTES
				INITIAL IN. W.G.	DIRTY IN. W.G.	MERV	D.S. %	QUAN.	WIDTH IN.	HEIGHT IN.	DEPTH IN.	MIN. MEDIA FACE AREA SQ. FT.	ACCESS TYPE	WIDTH IN.	HEIGHT IN.	DEPTH IN.		
AF-1	AHU-1	PLEATED	15000	0.23	1	13	35	8	24	24	2	30.4	SIDE	102	60	34		
AF-2	AHU-2	PLEATED	15000	0.23	1	13	35	8	24	24	2	30.4	SIDE	102	60	34		
AF-3	AHU-3	PLEATED	10000	0.17	1	13	35	6	24	20	2	24.5	SIDE	74	60	32		
								3	24	12	2	24.5						
AF-4	AHU-4	PLEATED	6600	0.23	1	13	35	2	24	24	2	13.1	SIDE	66	46	28		
								1	24	12	2	13.1						
								2	12	24	2	13.1						

GENERAL NOTES:
1. MODEL NUMBERS ARE FARR UNLESS OTHERWISE NOTED.
2. PROVIDE 25% TO 30% EFFICIENT 2 INCH THROW AWAY PREFILTERS
3. MERV DESIGNATES THE "MINIMUM EFFICIENCY REPORTING VALUE" AS EVALUATED UNDER ASHRAE STANDARD 52.2 1999.
4. 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.

PUMP SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	LOCATION	TYPE	COUPLING TYPE	WATERFLOW GPM	FLUID TYPE	COLDEST SYSTEM OPERATING TEMP. °F FOR PUMP SELECTION	PUMP HEAD FT.	OVERLOAD GPM	MINIMUM EFFICIENCY %	MOTOR			MODULATION/ CONTROL TYPE	ELECTRICAL				MODEL NUMBER	KEYED NOTES
											BHP	HP	RPM		VOLTS	PHASE	SCCR KA (NOTE 4)	OPTIONS/ ACCESSORIES		
CP-1	AHU-3	MEZZANINE	INLINE	CLOSE	32	WATER	45 °F	18	NON-OVERLOADING	53	0.26	3/4	1750	AUTO	480	3	5	-	e-90 1.5AAB	
CP-2	AHU-3	MEZZANINE	INLINE	CLOSE	32	WATER	45 °F	18	NON-OVERLOADING		0.26	3/4	1750	AUTO	480	3	5	-	e-90	STANDBY
CP-3	AHU-4	MEZZANINE	INLINE	CLOSE	18	WATER	45 °F	18	NON-OVERLOADING	64	0.17	3/4	1750	AUTO	480	3	5	-	e-90	
CP-4	AHU-4	MEZZANINE	INLINE	CLOSE	18	WATER	45 °F	18	NON-OVERLOADING		0.17	3/4	1750	AUTO	480	3	5	-	e-90	STANDBY

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBER ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.
4. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

ROOF MOUNTED PIPING SUPPORT APPLICATION SCHEDULE

	SUPPORT TYPE								SHIELD TYPE			
PIPE TYPE & SIZE	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	MSS TYPE 39 PROTECTION SADDLE	MSS TYPE 40 INSULATION PROTECTION SHIELD	THERMAL-HANGER SHIELD	KEYED NOTES
SINGLE PIPES												
REFRIGERANT PIPE NPS 4 AND SMALLER				X	X			X				
MULTIPLE PARALLEL PIPES												
REFRIGERANT PIPE NPS 4 AND SMALLER	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.

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KEY PLAN

OWNER
Hamtramck
Public Schools

PROJECT NAME
HVAC Improvements
Phase 1
Community Center

11350 Charest St.
Hamtramck, MI 48212

PROJECT NO.
22-106B

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MECHANICAL SCHEDULES

SHEET NO.
M7-02

POWER VENTILATOR SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	AIRFLOW CFM	T.S.P. IN. W.G.	TIP SPEED FPM	FAN RPM	MOTOR				CURB HEIGHT INCHES	MODULATION/ CONTROL TYPE	ELECTRICAL				MAXIMUM SOUND POWER LEVELS														MODEL NUMBER	KEYED NOTES
							BHP	HP	RPM	DRIVE TYPE			VOLTS	PHASE	SCCR KA (NOTE 3)	OPTIONS/ ACCESSORIES	UNIT DISCHARGE Lw BY OCTAVE BAND								UNIT INLET Lw BY OCTAVE BAND									
																	63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)	63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)		
EF-1	ENTIRE BUILDING	BACKWARD INCLINED	4000	1.5	6787	1565	1.85	2	1725	BELT	–	AUTO	480	3	5	B	92	84	88	80	75	72	68	62	92	84	88	80	75	72	68	62	USF-18	
EF-2	ENTIRE BUILDING	BACKWARD INCLINED	4000	1.5	6787	1565	1.85	2	1725	BELT	–	AUTO	480	3	5	B	101	91	88	82	77	73	68	63	101	91	88	82	77	73	68	63	USF-18	

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

VIBRATION ISOLATOR APPLICATION SCHEDULE

EQUIPMENT TYPE	EQUIPMENT CATEGORY	HORSEPOWER AND OTHER	RPM	EQUIPMENT LOCATION						KEYED NOTES
				SLAB ON GRADE			UP TO 40 FT (12 M) FLOOR SPAN			
				BASE TYPE	ISOLATOR TYPE	MIN. DEFL., IN. (MM)	BASE TYPE	ISOLATOR TYPE	MIN. DEFL., IN. (MM)	
REFRIGATION MACHINES AND CHILLERS	RECIPROCATING CENTRIFUGAL, SCROLL	ALL ALL	ALL ALL	A A	2 1a OR 1b	0.25 (6) 0.25 (6)	A A	4 4	2.50 (64) 1.50 (38)	NOTE 3
	SCREW ABSORPTION AIR-COOLED RECIP., SCROLL	ALL ALL ALL	ALL ALL ALL	A A A	1a OR 1b 1a OR 1b 2	1.00 (25) 0.25 (6) 0.25 (6)	A A A	4 4 4	2.50 (64) 1.50 (38) 2.50 (64)	
	AIR-COOLED SCREW OPEN CENTRIFUGAL	ALL ALL	ALL ALL	A C	4 1a OR 1b	1.00 (25) 0.25 (6)	B C	4 4	2.50 (64) 1.50 (38)	
PUMPS	CLOSE COUPLED	≤7.5 ≥10	ALL ALL	B C	2 3	0.25 (6) 0.75 (19)	C C	3 3	0.75 (19) 1.50 (38)	NOTE 3
	INLINE	5 TO 25 ≥30	ALL ALL	A A	3 3	0.75 (19) 1.50 (38)	A A	3, 8a OR 8b 3, 8a OR 8b	1.50 (38) 2.50 (64)	
	END SUCTION AND DOUBLE SUCTION/SPLIT CASE	≤40 50 TO 125 ≥150	ALL ALL ALL	C C C	3 3 3	0.75 (19) 0.75 (19) 0.75 (19)	C C C	3 3 3	1.50 (38) 2.50 (64) 3.50 (89)	
	PACKAGED PUMP SYSTEMS	ALL	ALL	A	3	0.75 (19)	C	3	2.50 (64)	
BASE MOUNTED AXIAL FANS, PLENUM FANS, CABINET FANS, FAN SECTIONS, CENTRIFUGAL INLINE FANS	UP TO 22 IN. DIAMETER	ALL	ALL	A	2	0.25 (6)	C	3	0.75 (19)	NOTES 1, 3, 4
	24 IN. DIAMETER AND UP	≤2 IN. SP	UP TO 300 301 TO 500 500 AND UP	B B B	3 3 3	2.50 (64) 0.75 (19) 0.75 (19)	C C B	3 3 3	3.50 (89) 2.50 (64) 1.50 (38)	
		>2 IN. SP	UP TO 300 301 TO 500 500 AND UP	C C C	3 3 3	2.50 (64) 1.50 (38) 0.75 (19)	C C C	3 3 3	3.50 (89) 2.50 (64) 2.50 (64)	
CENTRIFUGAL FANS	UP TO 22 IN. DIAMETER	ALL	ALL	B	2	0.25 (6)	B	3	1.50 (38)	NOTES 1, 3, 4
	24 IN. DIAMETER AND UP	≤40	UP TO 300 301 TO 500 500 AND UP	B B B	3 3 3	2.50 (64) 1.50 (38) 0.75 (19)	B B B	3 3 3	3.50 (89) 2.50 (64) 1.50 (38)	
		≥50	UP TO 300 301 TO 500 500 AND UP	C C C	3 3 3	2.50 (64) 1.50 (38) 1.00 (25)	C C C	3 3 3	3.50 (89) 2.50 (64) 2.50 (64)	
PROPELLER FANS	WALL-MOUNTED ROOF EXHAUSTER	ALL ALL	ALL ALL	A A	1a OR 1b 1a OR 1b	0.25 (6) 0.25 (6)	A D OR E	1a OR 1b 4	0.25 (6) 1.50 (38)	NOTE 4
BASE MOUNTED CONDENSING UNITS	ALL ALL	≤1HP >1HP	ALL ALL	A OR B A OR B	2 2	0.25 (6) 0.25 (6)	A OR B A OR B	2 4	0.25 (64) 2.50 (64)	NOTE 3
PACKAGED AND MODULAR AIR HANDLING, AIR CONDITIONING, AND HEATING AND VENTILATING UNITS	ALL	≤10	ALL	A	3	0.75 (19)	A	3	0.75 (19)	NOTES 1, 3, 4
	ALL	≤15 AND ≤4 IN. SP	UP TO 300 301 TO 500 500 AND UP	A A A	3 3 3	0.75 (19) 0.75 (19) 0.75 (19)	C A A	3 3 3	3.50 (89) 2.50 (64) 1.50 (38)	
		≥15 AND/OR >4 IN. SP	UP TO 300 301 TO 500 500 AND UP	B B B	3 3 3	0.75 (19) 0.75 (19) 0.75 (19)	C C C	3 3 3	3.50 (89) 2.50 (64) 2.50 (64)	
PACKAGED AND MODULAR AIR HANDLING, AIR CONDITIONING AND HEATING AND VENTILATING UNITS WITH INTERNAL SPRING ISOLATORS	ALL	ALL	ALL	A	1a	0.25 (6)	A	1a	0.25 (6)	NOTES 1, 3, 4
BASE MOUNTED DUCTED ROTATING EQUIPMENT	SMALL FANS, FAN-POWERED BOXES	≤600 CFM >600 CFM	ALL ALL	A A	3 3	0.50 (13) 0.75 (19)	A A	3 3	0.50 (13) 0.75 (19)	NOTES 3, 4
SUSPENDED DUCTED ROTATING EQUIPMENT	SMALL FANS, FAN-POWERED BOXES	≤600 CFM >600 CFM	ALL ALL				A A	8a OR 8b 8a OR 8b	0.50 (13) 0.75 (19)	NOTES 3, 4

GENERAL NOTES:

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

BASE TYPES:

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

ISOLATOR TYPES:

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

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KEY PLAN

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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

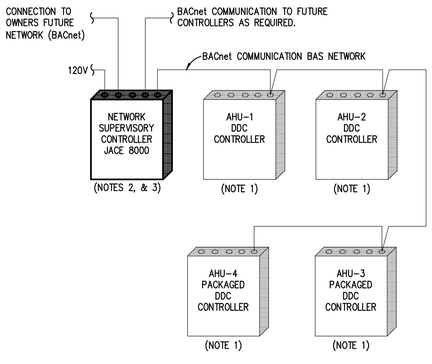
SYMBOL	DESCRIPTION
R	COIL – RELAY
	CONTACT – INSTANT OPERATING, NO
	CONTACT – INSTANT OPERATING, NC
	GROUND
	MOTOR, SINGLE PHASE
	SWITCH – LIMIT, NO
	SWITCH – PRESSURE & VACUUM, NC
	WIRE TERMINATION AT DEVICE
	WIRE TO WIRE TERMINATION

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.

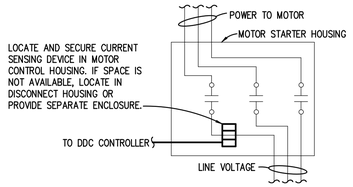


DDC SYSTEM ARCHITECTURE

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 VYCON NETWORK SUPERVISORY CONTROLLER FOR CONNECTION TO OWNER'S FUTURE FACILITY NETWORK (BACnet). COORDINATE BACnet CONNECTION..
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.

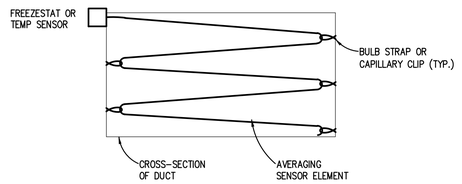


CURRENT SWITCH INSTALLATION DETAIL

TYPICAL

NOTES:

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

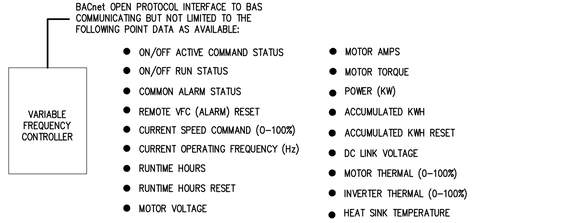


AVERAGING ELEMENT INSTALLATION DETAIL

TYPICAL

NOTES:

1. FREEZESTAT QUANTITY SHALL BE ONE PER 20 SQ. FT. OF CROSS-SECTIONAL AREA.
2. AVERAGING DDC SENSOR QUANTITY SHALL BE SUFFICIENT TO COVER AND SENSE THE CROSS-SECTIONAL AREA.
3. PROVIDE REQUIRED CAPILLARY STRAP OR CLIPS TO SUPPORT SENSOR TO PREVENT VIBRATION FROM AIR MOVEMENT.
4. PROVIDE PROTECTION AT EACH CAPILLARY STRAP OR CLIP TO PREVENT ABRASION TO CAPILLARY.

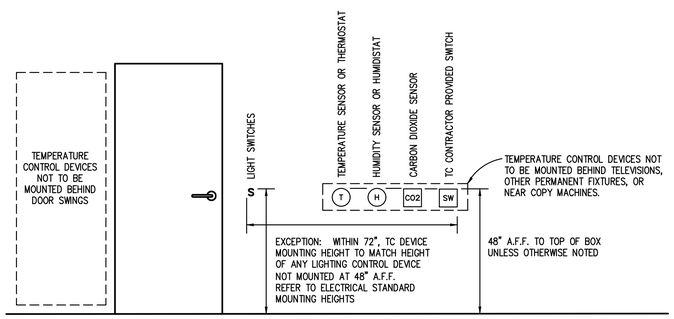


VFC BACnet INTERFACE & MONITORING REQUIREMENTS

TYPICAL FOR PUMP & FAN VFCs

NOTE:

TC CONTRACTOR SHALL COORDINATE BACnet OPEN PROTOCOL WIRE TERMINATION REQUIREMENTS AND POINT INTEGRATION CAPABILITIES WITH VFC SUPPLIER/MANUFACTURER AND PROVIDE APPROPRIATE BAS COMPONENTS FOR COMMUNICATION INTERFACE TO BAS.

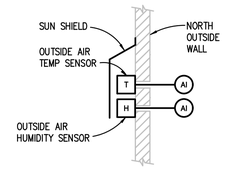


TC DEVICE STANDARD MOUNTING HEIGHTS DETAIL

NO SCALE

TC GENERAL NOTES

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



OA SENSOR INSTALLATION DETAIL

NO SCALE

NOTES:

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

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KEY PLAN

OWNER

Hamtramck Public Schools

PROJECT NAME

HVAC Improvements Phase 1 Community Center

11350 Charest St.
Hamtramck, MI 48212

PROJECT NO.

22-106B

ISSUES / REVISIONS

OWNER REVIEW	03/22/2022
Bidding - Construction	04/07/2022

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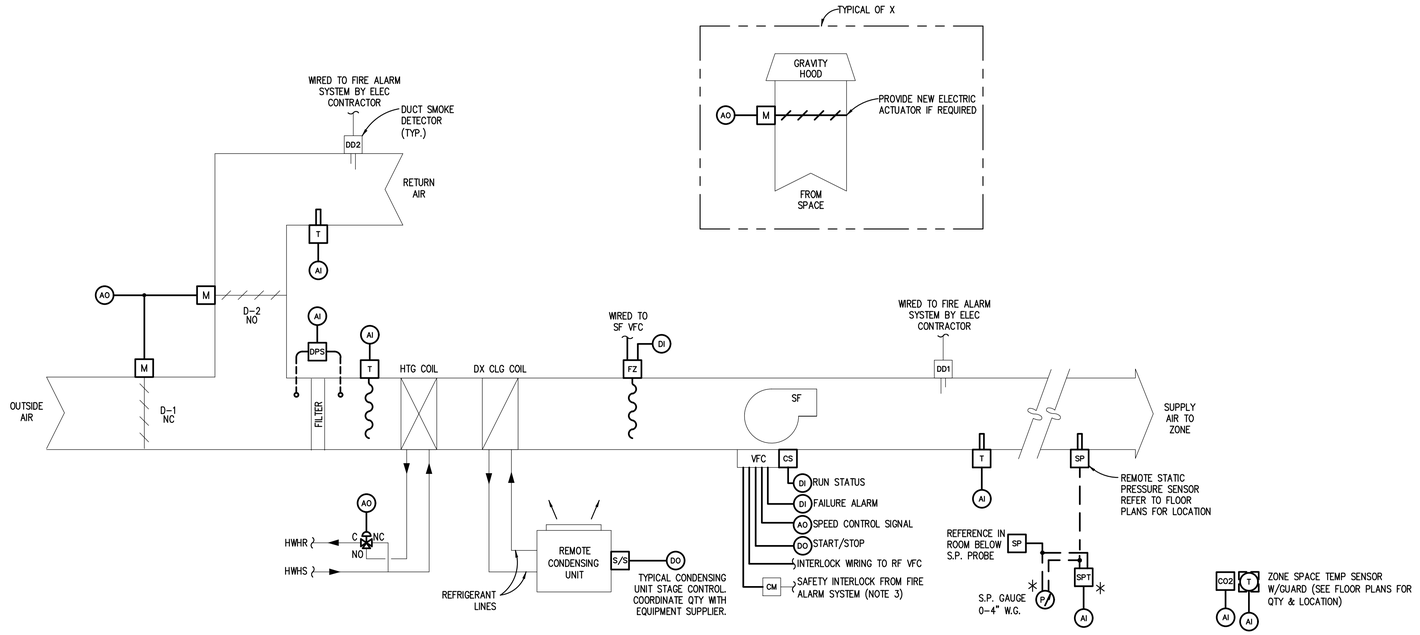
SHEET NAME

TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES

SHEET NO.

M8-01

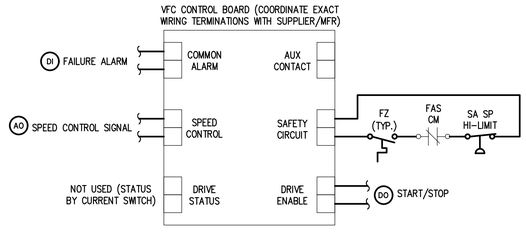


AHU-1 & 2 CONTROL

SERVES THE GYM & AUX GYM

NOTES:

1. 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 MOTOR STARTER CONTROL CIRCUIT.



AHU-1 & 2 SF VFC WIRING

NOTE:

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

SEQUENCE OF OPERATION

AIR HANDLING UNIT – 1 & 2:

NOTE: ALL SETPOINTS INCLUDING RESET SCHEDULE SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

1. SUPPLY FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. AHU SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (COMPENSATED BY OPTIMUM START PROGRAM) AND UNOCCUPIED CYCLE MODE.
2. FOR HEATING OCCUPIED MODE, AHU SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 70°F.
3. FOR COOLING OCCUPIED MODE, AHU SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 76°F.
4. FOR HEATING UNOCCUPIED MODE, AHU SHALL CYCLE ON & OFF TO MAINTAIN A SETBACK SPACE TEMP SETPOINT OF 62°F.
5. FOR COOLING UNOCCUPIED MODE, AHU SHALL CYCLE ON & OFF TO MAINTAIN A SETUP SPACE TEMP SETPOINT OF 80°F.
6. SUPPLY FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. SF CURRENT SWITCH SHALL PROVIDE FEEDBACK TO ENABLE TEMPERATURE CONTROLS. ABNORMAL STATUS CONDITION FOR SF SHALL ACTIVATE ALARM.
7. WHEN AHU IS ACTIVATED DURING OCCUPIED MODE; OUTSIDE, RETURN & RELIEF AIR DAMPERS SHALL BE ALLOWED TO MODULATE AS DESCRIBED. WHEN AHU IS DEACTIVATED OR OPERATING IN UNOCCUPIED CYCLE MODE OR MORNING WARM-UP MODE, DAMPERS SHALL REMAIN IN NORMAL POSITIONS.
8. WHEN SPACE TEMP IS BELOW HEATING SETPOINT, DDC SHALL KEEP DAMPERS AT MINIMUM OA POSITION AND MODULATE HEATING COIL VALVE TO MAINTAIN SPACE TEMP SETPOINT.
9. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OA TEMP IS LESS THAN ECONOMIZER LOCKOUT OF 65°F, DDC SHALL MODULATE DAMPERS ABOVE MINIMUM OA POSITION TO MAINTAIN SPACE TEMP SETPOINT.
10. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OA TEMP IS GREATER THAN ECONOMIZER LOCKOUT TEMP OF 65°F, DAMPERS SHALL REMAIN AT MINIMUM OA POSITION AND DDC SHALL STAGE DX COOLING TO MAINTAIN SPACE TEMP SETPOINT.
11. MINIMUM OA DAMPER SETPOINT SHALL BE RESET PROPORTIONALLY BETWEEN MIN/MIN (BASE LOAD VENTILATION REQUIREMENT) AND MAX/MIN (FULL OCCUPANCY REQUIREMENT) BASED ON RETURN AIR CARBON DIOXIDE LEVEL AS FOLLOWS:

CO2	OA DAMPER MIN POSITION
600 PPM	MIN-MIN SET FOR 1500 CFM
1,100 PPM	MAX-MIN SET FOR 6750 CFM

CONTRACTOR SHALL COORDINATE DAMPER POSITIONS WITH AIR BALANCER TO ACHIEVE THESE AIRFLOWS.

12. FREEZESTAT(S) SHALL DEACTIVATE SUPPLY FAN WHEN TEMPERATURE IS 35°F OR BELOW.
13. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE SF WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
14. FILTER STATUS SHALL BE MONITORED BY DDC THRU DIFFERENTIAL PRESSURE SWITCH.
15. WHEN AHU IS DEACTIVATED, DX COOLING SHALL REMAIN OFF.
16. WHEN OA TEMP IS BELOW 40°F AND AHU IS DEACTIVATED, HEATING COIL VALVE SHALL BE MODULATED BY DDC BASED ON MIXED AIR TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50°F.

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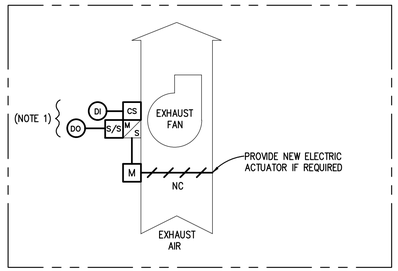
SHEET NAME

TEMPERATURE CONTROLS

SHEET NO.

M8-02



EXHAUST FAN CONTROL

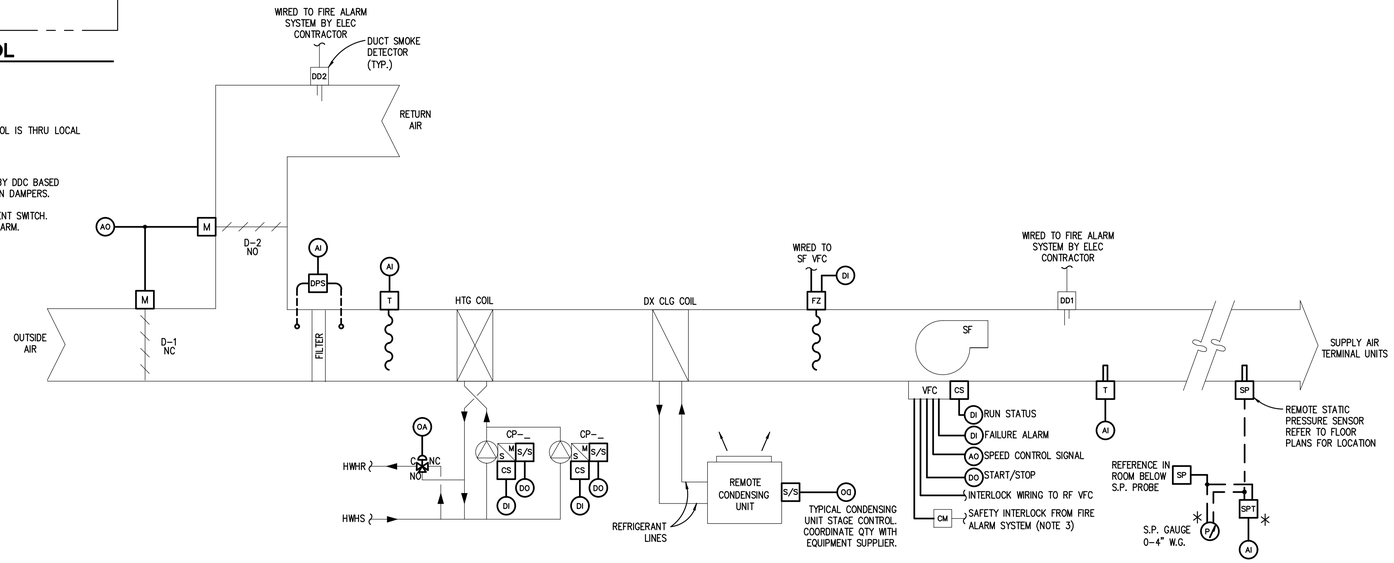
EF-1 SERVES AHU-3
EF-2 SERVES AHU-4

NOTES:

1. PROVIDE OR REUSE DDC CONTROL UNLESS CONTROL IS THRU LOCAL SWITCH. FIELD VERIFY AS REQUIRED.

SEQUENCE OF OPERATION

1. EXHAUST FAN SHALL BE STARTED AND STOPPED BY DDC BASED ON TIME SCHEDULE. WIRING INTERLOCK SHALL OPEN DAMPERS.
2. DDC SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.

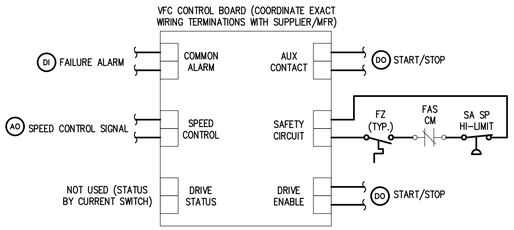


AHU- 3 & 4 CONTROL

SERVES TERMINAL UNITS

NOTES:

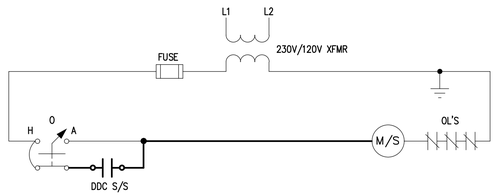
1. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE. TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO MOTOR STARTER CONTROL CIRCUIT.



AHU SF VFC WIRING

NOTE:

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



HWH COIL CIRC PUMP CP-X M/S WIRING

TYPICAL

SEQUENCE OF OPERATION

AIR HANDLING UNIT:

NOTE: ALL SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

1. SUPPLY FAN WITH INTERLOCKED RELIEF FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. AHU SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (COMPENSATED BY OPTIMUM START PROGRAM), TEMPORARY OCCUPIED MODE (SET FOR 2 HRS ENABLED FROM OVERRIDE SWITCH ON VAV TERMINAL UNIT TEMPERATURE SENSORS) AND NIGHT CYCLE MODE.
2. DURING HEATING SEASON UNOCCUPIED PERIODS, AHU SHALL UTILIZE NIGHT CYCLE MODE TO MAINTAIN A NIGHT SETBACK TEMPERATURE OF 62°F. DDC SHALL REFERENCE ALL VAV BOX CONTROLLERS ASSOCIATED WITH RESPECTIVE AHU AND CYCLE AHU BASED ON LOWEST SPACE TEMP READING.
3. DURING COOLING SEASON UNOCCUPIED PERIODS, AHU SHALL UTILIZE NIGHT CYCLE MODE TO MAINTAIN A NIGHT SETUP TEMPERATURE OF 80°F. DDC SHALL REFERENCE ALL VAV BOX CONTROLLERS ASSOCIATED WITH RESPECTIVE AHU AND CYCLE AHU BASED ON HIGHEST SPACE TEMP READING.
4. SUPPLY FAN AND RETURN FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
5. VFC COMMON FAILURE ALARM FOR EACH FAN SHALL BE MONITORED BY DDC THRU AVAILABLE CONTACTS AT RESPECTIVE FAN VFC. TC CONTRACTOR HAS OPTION TO UTILIZE LAN COMMUNICATION WITH VFC IN LIEU OF INDIVIDUAL POINT TERMINATION (TC CONTRACTOR SHALL PROVIDE NECESSARY COMPONENTS AT DDC PANEL AND VFC).
6. WHEN AHU IS ACTIVATED DURING OCCUPIED MODE; OUTSIDE AIR, RETURN AIR & RELIEF AIR DAMPERS (HEREIN REFERRED TO AS DAMPERS) SHALL BE ALLOWED TO MODULATE AS DESCRIBED. WHEN AHU IS DEACTIVATED OR OPERATING IN NIGHT CYCLE MODE OR MORNING WARM-UP MODE, DAMPERS SHALL REMAIN IN NORMAL POSITIONS.
7. (WHERE APPLICABLE) DDC SHALL ACTIVATE HEATING COIL CIRC PUMP WHENEVER OA TEMP IS BELOW 55°F WITH SF ACTIVATED OR WHENEVER OA TEMP IS BELOW 40°F WITH SF DEACTIVATED. PUMP STATUS SHALL BE MONITORED BY DDC THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
8. WHEN OA TEMP IS 55°F OR BELOW, DDC SHALL MODULATE DAMPERS, ABOVE MINIMUM OA POSITION, IN SEQUENCE WITH HEATING COIL VALVE AND COOLING COIL VALVE (OR DX COOLING CONTROL) TO MAINTAIN DA TEMP SETPOINT.
9. WHEN OA TEMP IS ABOVE 55°F AND OA ENTHALPY IS GREATER THAN RA ENTHALPY, DAMPERS SHALL REMAIN AT MINIMUM OA POSITION AND COOLING COIL VALVE SHALL BE MODULATED (OR DX COOLING SHALL BE CONTROLLED) TO MAINTAIN DA TEMP SETPOINT.
10. WHEN OA TEMP IS ABOVE 55°F AND OA ENTHALPY IS LESS THAN RA ENTHALPY, OA ECONOMIZER CYCLE SHALL MODULATE MIXED AIR DAMPERS IN SEQUENCE WITH COOLING COIL VALVE (OR DX COOLING CONTROL) TO MAINTAIN DA TEMP SETPOINT.
11. DISCHARGE AIR TEMP SETPOINT SHALL BE BASED ON THE FOLLOWING OUTSIDE AIR TEMP RESET SCHEDULE:

OAT	DAT
≤ 30°F	60°F
≥ 55°F	55°F

12. DURING MORNING WARM-UP, DAT SETPOINT SHALL BE 90°F UNTIL BUILDING OCCUPANCY TIME OR WHEN OCCUPIED MODE SPACE TEMPERATURE IS REACHED IN ONE OF THE ASSOCIATED ZONES.
13. DDC SHALL MONITOR OUTSIDE AIRFLOW AND MODULATE DAMPERS ACCORDINGLY TO MAINTAIN MINIMUM OA CFM. REFER TO MECHANICAL SCHEDULES FOR MINIMUM OUTSIDE AIR INFORMATION.
14. SF VFC SHALL BE MODULATED BY DDC TO MAINTAIN SYSTEM SUPPLY AIR STATIC PRESSURE SETPOINT THAT SHALL BE RESET BASED ON DAMPER POSITION FEEDBACK FROM ASSOCIATED VAV BOX CONTROLLERS AS FOLLOWS: SETPOINT SHALL BE ADJUSTED TO ALLOW 3 SA TERMINAL UNITS TO OPERATE AT 90% OPEN DAMPER POSITION. BELOW 3 AT 90%, SETPOINT SHALL BE SLOWLY DECREASED. ABOVE 3 AT 90%, SETPOINT SHALL BE SLOWLY INCREASED. SETPOINT RANGE SHALL BE 0.5" W.G. TO 1.5"W.G. (BOTH ADJUSTABLE). STATIC PRESSURE HIGH LIMIT AT AHU WITH SETPOINT OF 5.0" W.G. SHALL PROVIDE OVERRIDE CONTROL AND HIGH LIMIT SWITCH SHALL PROVIDE HARDWIRED SAFETY.
15. RF VFC SHALL BE MODULATED TO MAINTAIN A CFM DIFFERENTIAL SETPOINT BETWEEN SUPPLY AIRFLOW AND RETURN AIRFLOW. REFER TO MECHANICAL SCHEDULES FOR SUPPLY AND RETURN AIRFLOW INFORMATION. FOR WARM-UP AND NIGHT CYCLE MODES (WHEN DAMPERS ARE IN NORMAL POSITION), THE CFM DIFFERENTIAL SHALL BE ZERO AND SUPPLY STATIC PRESSURE CONTROL SHALL BE LIMITED BY THE MAXIMUM RF AIRFLOW.
16. FREEZESTAT(S) SHALL DEACTIVATE SUPPLY FAN WHEN TEMPERATURE IS 35°F OR BELOW. DDC SHALL MONITOR FREEZESTAT STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
17. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE SF & INTERLOCKED RF WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
18. WHEN AHU IS DEACTIVATED, COOLING COIL VALVE SHALL REMAIN CLOSED (OR DX COOLING SHALL REMAIN OFF) AND HEATING COIL VALVE SHALL BE MODULATED BY DDC BASED ON MA TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50oF.
19. VAV BOXES WITH ASSOCIATED TEMPERING COILS SHALL BE CONTROLLED BY UNITARY DDC CONTROLLERS (REFER TO VAV TERMINAL UNIT SEQUENCE OF OPERATION.)

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SHEET NAME
TEMPERATURE CONTROLS

SHEET NO.
M8-03

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
X	DUPLEX UPS RECEPTACLE
X	ABOVE COUNTER TELECOMMUNICATION OUTLET "X" INDICATES TYPE
	DUPLEX RECEPTACLE WITH 2 USB PORTS OUTLET
X	4 PORT USB CHARGING STATION
	CEILING MOUNTED DUPLEX/QUAD RECEPTACLE
	POWER POLE
	WALL/CEILING MOUNTED SPECIAL RECEPTACLE – REFER TO ELECTRICAL STANDARD SCHEDULES
IC	INTERCOM OUTLET
	MULTI-OUTLET SURFACE RACEWAY
"X"	MULTI-SERVICE DROP SEE ELECTRICAL DETAILS AND DIAGRAMS SHEET "X" INDICATES TYPE
PTX	POKE-THROUGH ASSEMBLY "X" INDICATES TYPE
FBX	FLOOR SERVICE FITTING "X" INDICATES TYPE
AFX	ACCESS FLOOR SERVICE FITTING "X" INDICATES TYPE
RX	CORD REEL "X" INDICATES TYPE
S S	DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S3 S3	3-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S4 S4	4-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
ST	DIGITAL TIME SWITCH
SI	ILLUMINATED TOGGLE SWITCH FOR CONTROL OF LIGHTING ON CRITICAL POWER–ILLUMINATED WHEN SWITCH IS IN "OFF" POSITION
SL	LOW VOLTAGE SWITCH
SO	OCCUPANCY SENSOR
SO2	OCCUPANCY SENSOR REFER TO ELECTRICAL STANDARD SCHEDULES
OS X	OCCUPANCY SENSOR "X" INDICATES TYPE

SYMBOL	DESCRIPTION
CP	CONTROL PANEL
	MOTOR
VFC	VARIABLE FREQUENCY CONTROLLER.
	MANUAL CONTROLLER
	MAGNETIC CONTROLLER
	COMBINATION MAGNETIC CONTROLLER
	NON–FUSIBLE DISCONNECT SWITCH
	FUSIBLE DISCONNECT SWITCH
CB	ENCLOSED CIRCUIT BREAKER
	PUSH BUTTON STATION
J	JUNCTION BOX
	HARD WIRE POWER CONNECTION
	GROUND ROD
	GROUND CONNECTION
HH	HANDHOLE
X	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
X	TELECOMMUNICATION OUTLET "X" INDICATES TYPE
X	ABOVE COUNTER TELECOMMUNICATION OUTLET "X" INDICATES TYPE
X	TELECOMMUNICATION CEILING MOUNTED OUTLET "X" INDICATES TYPE
	TELECOMMUNICATION BACKBOARD
TGB	TELECOMMUNICATION GROUNDING BUS BAR
TMGB	TELECOMMUNICATION MAIN GROUNDING BUS BAR
IC	INTERCOM OUTLET
S	SPEAKER
S	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
S	DOUBLE FACE COMBINATION CLOCK/SPEAKER CEILING MOUNTED
	DOUBLE FACE CLOCK – WALL MOUNTED
S	DOUBLE FACE COMBINATION CLOCK/SPEAKER WALL MOUNTED
TC	TIME CLOCK
C	CONTACTOR
P	PHOTOCELL
TT	TWIST TIMER

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

REFER TO ELECTRICAL STANDARD SCHEDULES

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

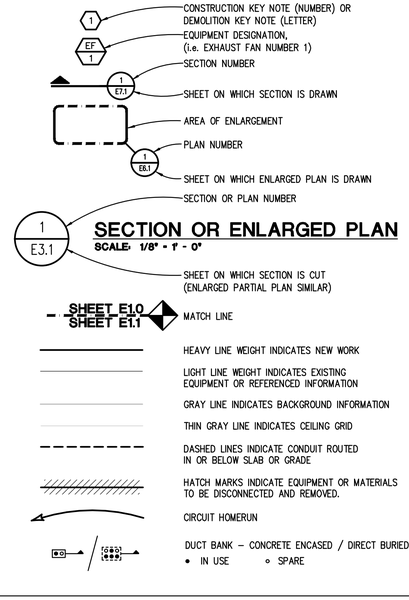
ELECTRICAL ABBREVIATION LIST

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 FURNISHED, OWNER INSTALLED
FU	FUSE
G/GRD/EG	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
HOA	HAND–OFF–AUTO
HP	HORSEPOWER
HV	HIGH VOLTAGE
HZ	HERTZ
IG	ISOLATED GROUND

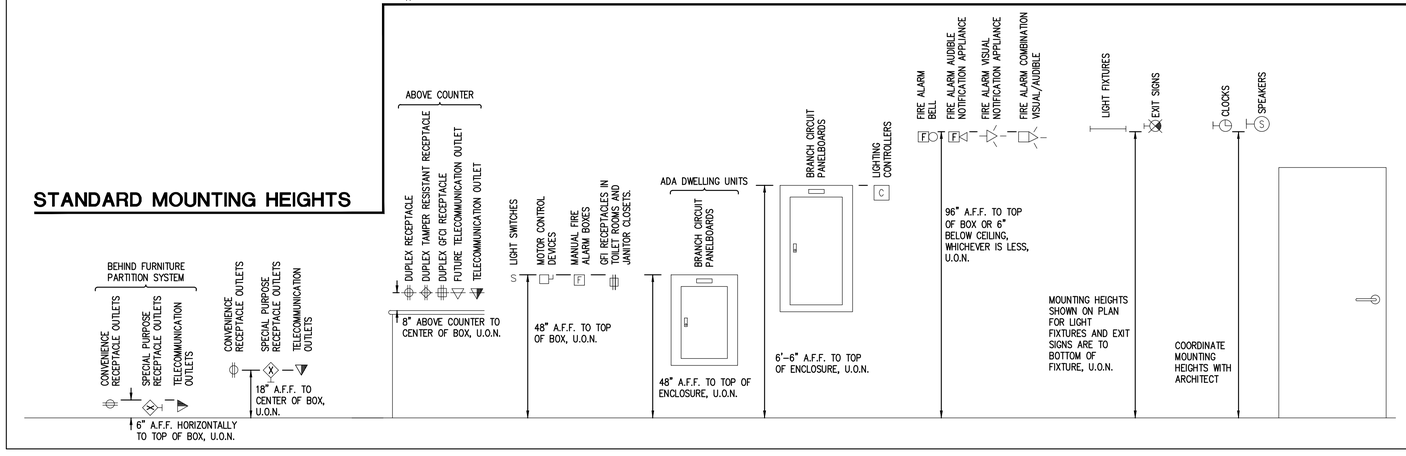
ABBREVIATION	DESCRIPTION
JB	JUNCTION BOX
KA	THOUSAND AMP
KV	KILOVOLT
KVA	KILOVOLT – AMPERES
KW	KILOWATT
KWH	KILOWATT – HOURS
LA	LIGHTNING ARRESTOR
LP	LIGHTING PANEL
LDP	LIGHTING DISTRIBUTION PANEL
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION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

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

STANDARD METHODS OF NOTATION



STANDARD MOUNTING HEIGHTS



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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 (480V, 3 PHASE)

MOTOR HP	SWITCH/ FUSE	CIRCUIT BREAKER	STARTER SIZE/TYPE	MOTOR DISCONNECT (NOTE 3)
1/2	30/3A	15A	1	30A
3/4	30/3A	15A	1	30A
1	30/6A	15A	1	30A
1 1/2	30/6A	15A	1	30A
2	30/6A	15A	1	30A
3	30/10A	15A	1	30A
5	30/15A	15A	1	30A
7 1/2	30/20A	20A	1	30A
10	30/20A	25A	1	30A
15	30/30A	40A	2	30A
20	60/40A	60A	2	60A
25	60/50A	70A	2	60A
30	60/60A.	80A	3	60A
40	100/80A.	90A	3	100A
50	100/100A.	100A	3	100A
60	200/125A.	125A	4	200A
75	200/150A.	150A	4	200A
100	200/200A.	200A	4	200A
125	200/200A.	225A	5	200A
150	400/250A.	250A	5	400A
200	400/350A.	350A	5	400A

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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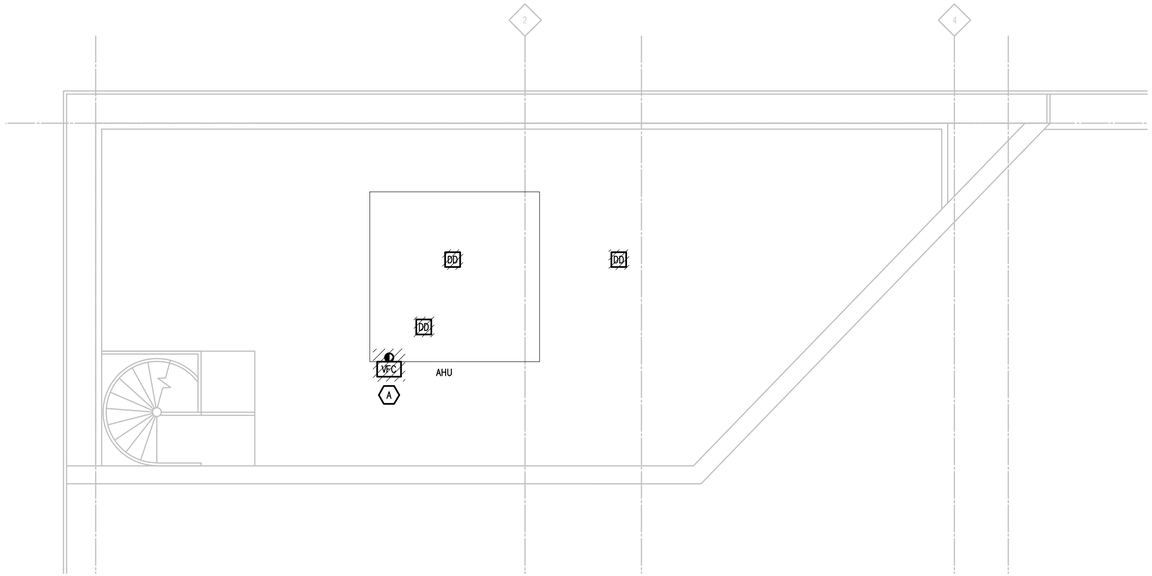
STP

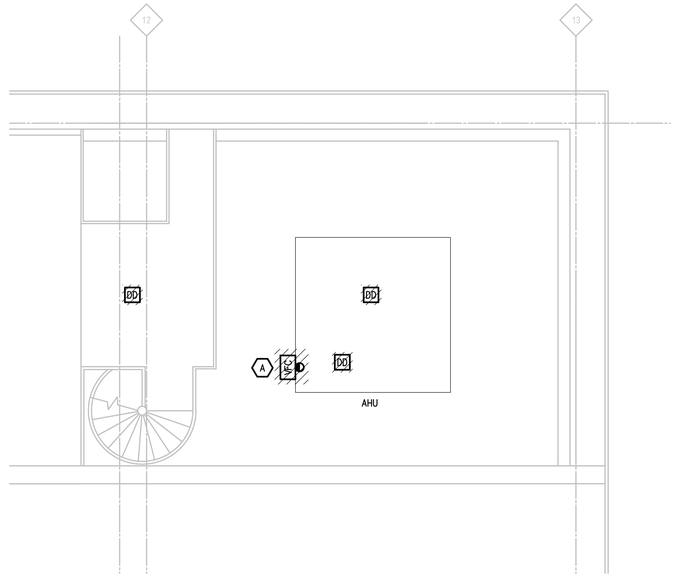
SHEET NAME
ELECTRICAL STANDARD SCHEDULES

SHEET NO.
E0-02

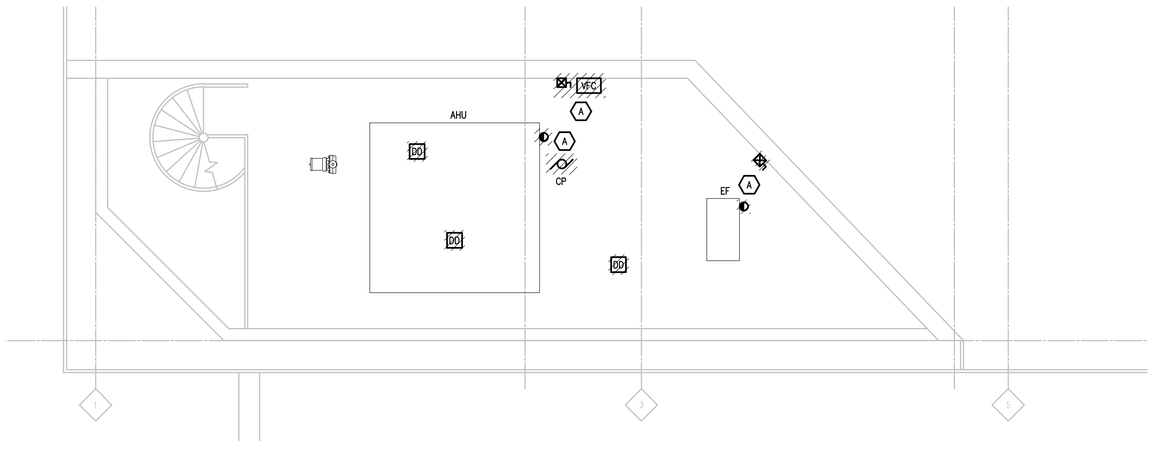
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



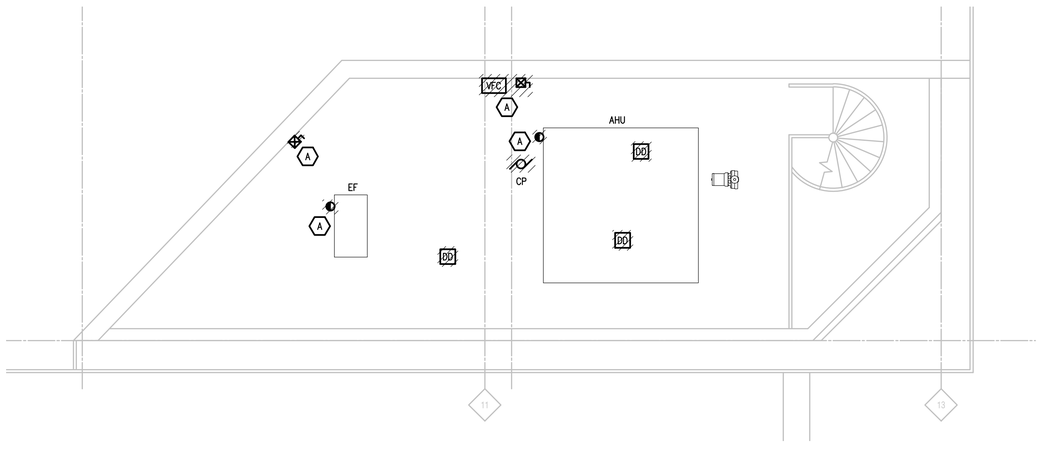
NORTHEAST MEZZANINE ELECTRICAL DEMOLITION PLAN
SCALE: 1/4" = 1' - 0"



SOUTHEAST MEZZANINE ELECTRICAL DEMOLITION PLAN
SCALE: 1/4" = 1' - 0"



NORTHWEST MEZZANINE ELECTRICAL DEMOLITION PLAN
SCALE: 1/4" = 1' - 0"



SOUTHWEST MEZZANINE ELECTRICAL DEMOLITION PLAN
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GENERAL AND KEYED NOTES: SEE SHEET ED3-20

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DRAWN BY
SEB

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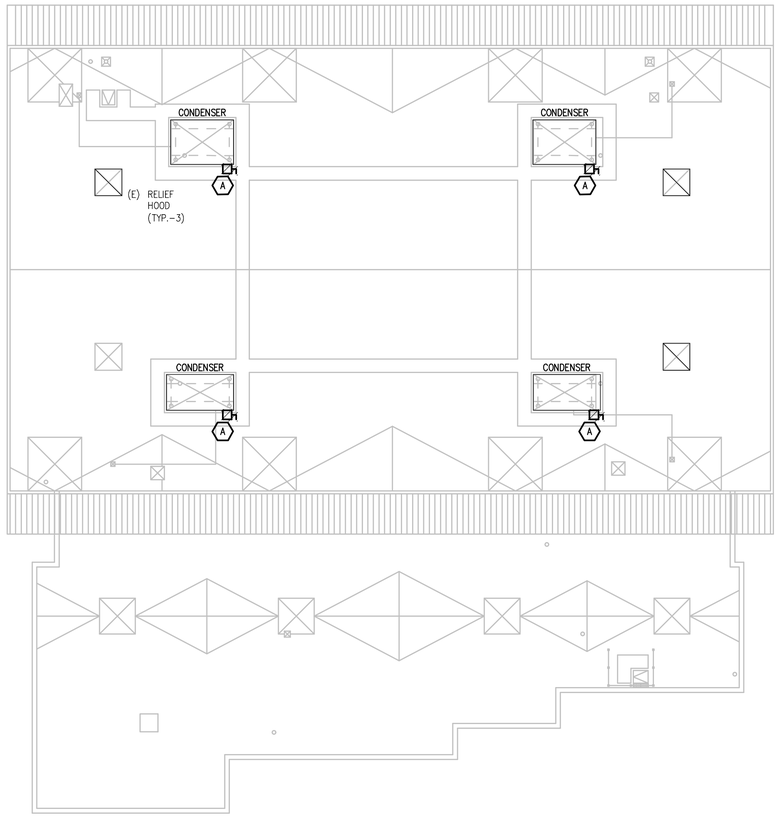
STP

SHEET NAME
MEZZANINE ELECTRICAL DEMOLITION PLAN

SHEET NO.
ED3-20

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



ROOF ELECTRICAL DEMOLITION PLAN
SCALE: 1/16" = 1' - 0"

ELECTRICAL DEMOLITION GENERAL NOTES:

1. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
2. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
3. REMOVE EQUIPMENT OR MATERIALS AS INDICATED ON PLAN WITH CROSS HATCHING. DEMOLITION SHALL INCLUDE, BUT NOT BE LIMITED TO, THOSE COMPONENTS SHOWN.
4. COORDINATE WITH NEW WORK PLANS, ONE LINE DIAGRAMS AND RISER DIAGRAMS FOR EXTENT OF DEMOLITION WORK.
5. PROVIDE PROPER SUPPORT FOR EXISTING TO REMAIN CONDUITS AND BOXES WHERE EXISTING SUPPORT IS TO BE REMOVED. RE-ROUTE BRANCH CIRCUIT CONDUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
6. REMOVE ALL CONDUIT AND WIRE BACK TO THE SOURCE OR NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
7. MAINTAIN ELECTRICAL SERVICE TO ALL LIGHTING FIXTURES, DEVICES AND EQUIPMENT THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM LOADS THAT ARE TO REMAIN.
8. DISPOSE OF ALL MATERIALS OFF SITE AND INCLUDE ALL COSTS FOR DISPOSAL IN BID. ALL MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING TCLP TESTING, PROPER DISPOSAL AND/OR RECYCLING OF FLUORESCENT LAMPS.
9. 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.

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22-106B

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SEB

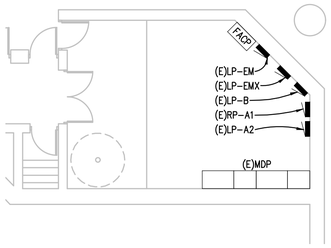
CHECKED BY
STP

APPROVED BY
STP

SHEET NAME
ROOF ELECTRICAL DEMOLITION PLAN

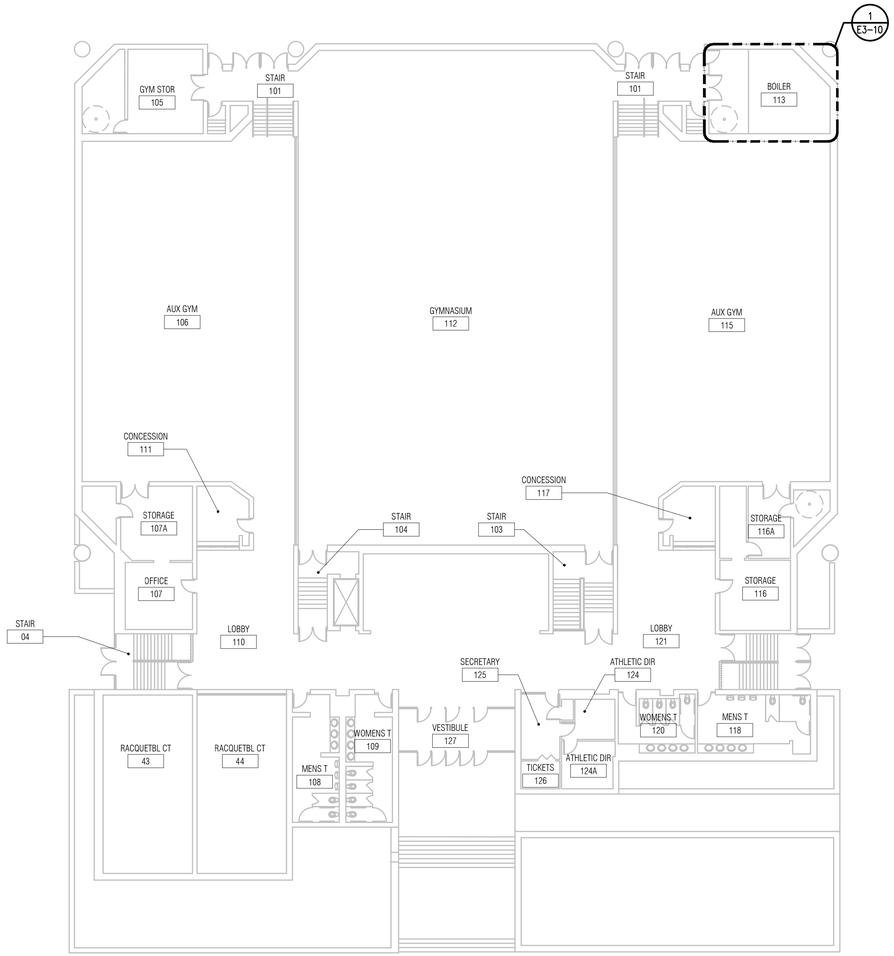
SHEET NO.
ED3-30

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



FIRST FLOOR ENLARGED ELECTRICAL NEW WORK PLAN

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



FIRST FLOOR ELECTRICAL PLAN

SCALE: 1/16" = 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 SIMPLEX 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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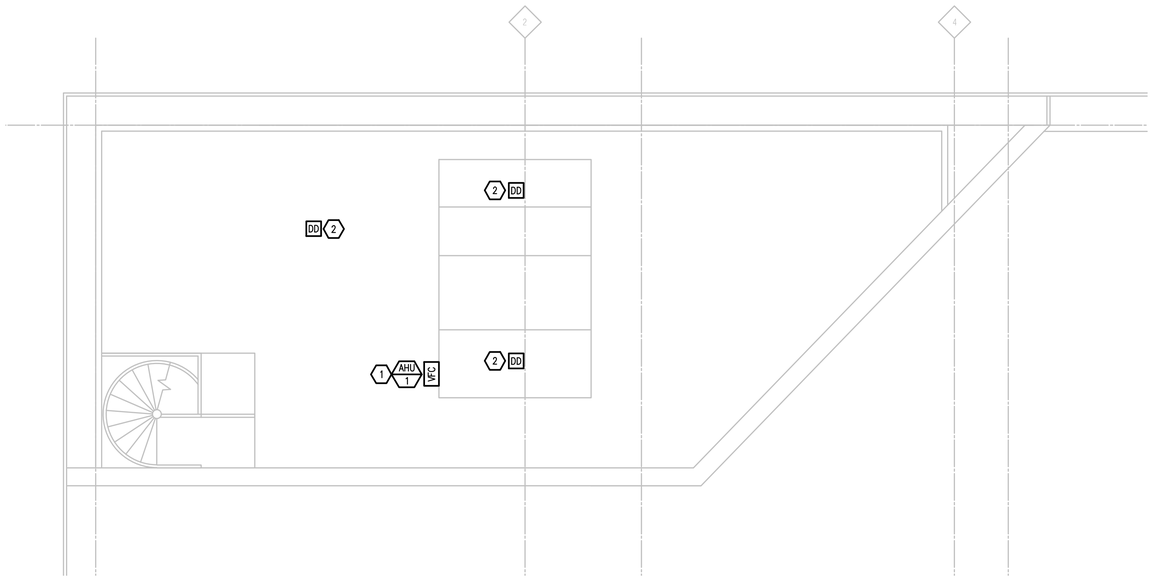
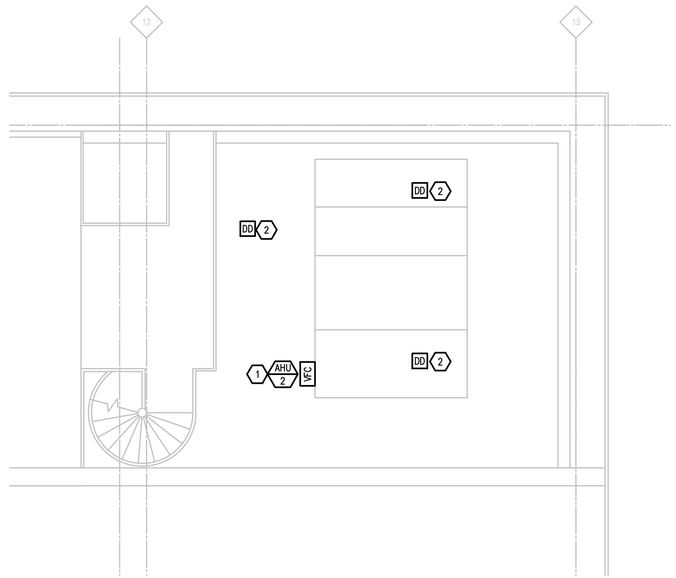
SHEET NAME
FIRST FLOOR ELECTRICAL PLAN

SHEET NO.
E3-10

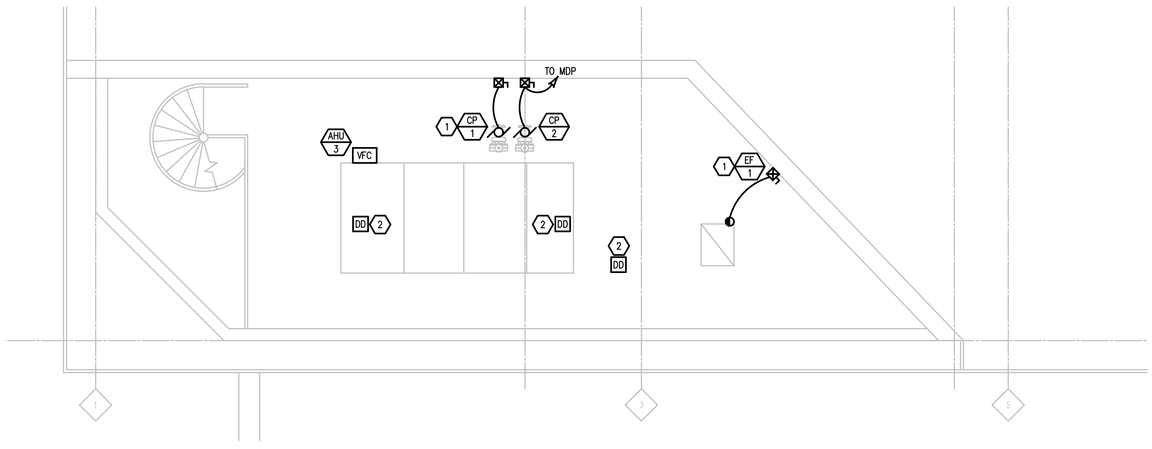
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



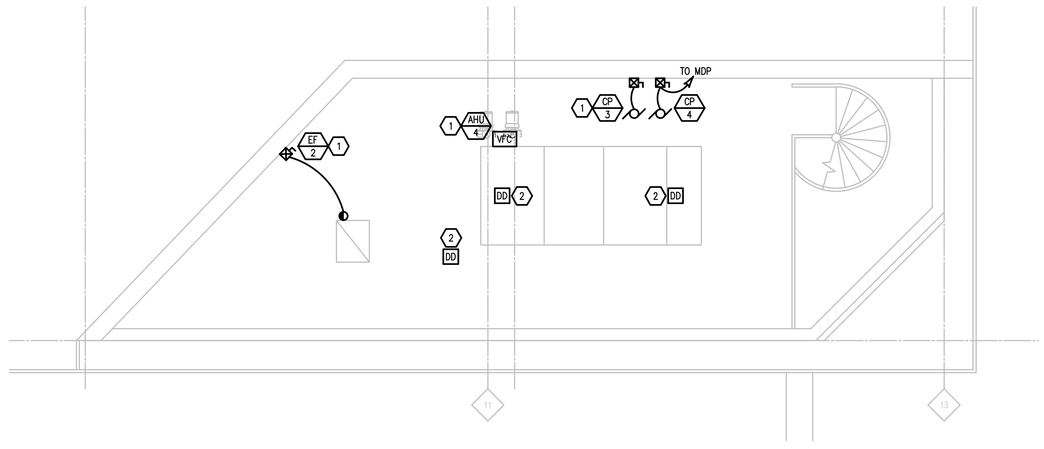
NORTHEAST MEZZANINE ELECTRICAL PLAN
SCALE: 1/4" = 1' - 0"



SOUTHEAST MEZZANINE ELECTRICAL PLAN
SCALE: 1/4" = 1' - 0"



NORTHWEST MEZZANINE ELECTRICAL PLAN
SCALE: 1/4" = 1' - 0"



SOUTHWEST MEZZANINE ELECTRICAL PLAN
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GENERAL AND KEYED NOTES: SEE SHEET E3-10

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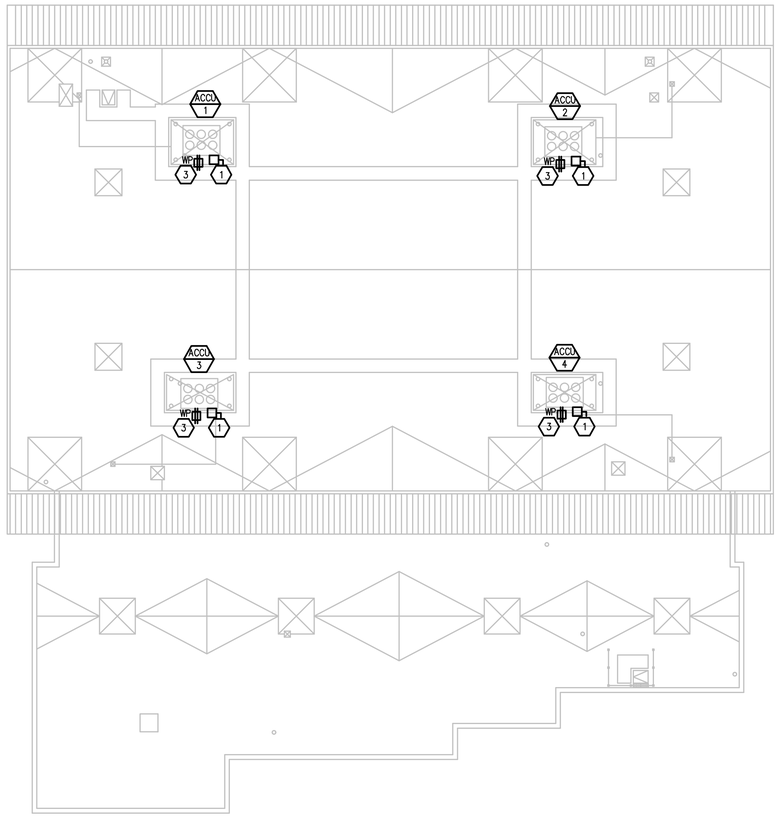
SHEET NAME
MEZZANINE ELECTRICAL PLAN

SHEET NO.
E3-20

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



ROOF ELECTRICAL PLAN
SCALE: 1/16" = 1' - 0"

ELECTRICAL GENERAL NOTES:

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7. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
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(#) CONSTRUCTION KEY NOTES:

1. CIRCUIT MECHANICAL EQUIPMENT TO MAINTAINED BRANCH CIRCUIT. EXTEND CONDUIT AND WIRE AS REQUIRED.
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SHEET NAME
ROOF ELECTRICAL PLAN

SHEET NO.
E3-30

DIAGRAM GENERAL NOTES:

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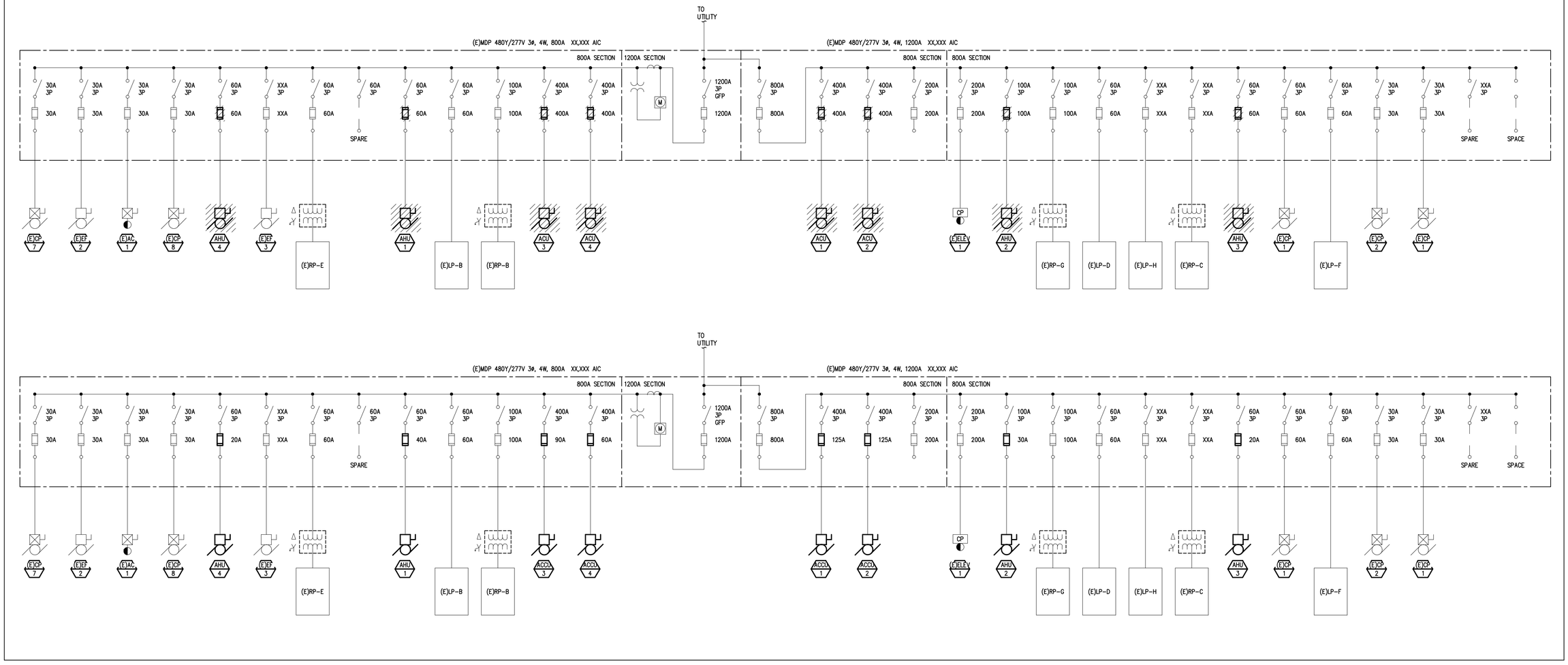
2. FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE–GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
3. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH THE MOTOR CIRCUIT 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.

(#) CONSTRUCTION KEY NOTES:

1. xxx
2. xxx



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SHEET NAME

ONE LINE DIAGRAM

SHEET NO.

E5-01