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NEW SMITH MIDDLE SCHOOL

Troy School District - Troy, Michigan 48098

2022 BOND PROGRAM - BID BACKAGE 03B

Project Number 22102

CONSTRUCTION DOCUMENTS

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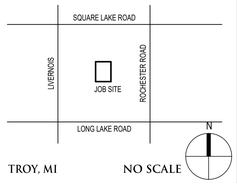
PROJECT DATA:

LOCATION MAP:



TROY, MI NO SCALE

ADDRESS: NEW SMITH MIDDLE SCHOOL
5850 Livernois Road
Troy, Michigan 48098

BUILDING:

BUILDING AREA(S) = 103,803 SF (FIRST LEVEL)
610 SF (MEZZANINE)
21,312 SF (SECOND LEVEL)
125,725 SF (TOTAL)

CODE:

GOVERNING CODES:

- **2016 SCHOOL FIRE SAFETY RULES** (2012 Life Safety Code, plus amendments)
- **2015 MICHIGAN BUILDING CODE**
- **2021 MICHIGAN PLUMBING CODE**
- **2021 MICHIGAN MECHANICAL CODE**
- **2015 MICHIGAN ENERGY CODE** (ANSI/ASHRAE/IESNA Standard 90.1-2013)
- **2023 MICHIGAN ELECTRICAL CODE** (2023 NEC, plus Part 6 Rules)
- **2010 MICHIGAN ELEVATOR RULES** (ASME A17.1-2010, ASME A18.1-2011)
- **MICHIGAN BARRIER FREE CODE** (Michigan Building Code 2015 and ICC A117.1-2009)
- **2013 MICHIGAN BOILER CODE RULES** (ASME Boiler and Pressure Vessel Code, 2019 edition) (National Board Inspection Code [NBIC], 2019 edition)

USE GROUP CLASSIFICATION: **"E" EDUCATION**

CONSTRUCTION TYPE: **TYPE II (000) LSC**
TYPE II-B (MBC)

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

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REGISTRATION SEALS

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PROJECT TITLE
NEW SMITH MIDDLE SCHOOL

PROJECT NO.
22102

DRAWING NO.
TS.2-03B

ABBREVIATIONS

A

ABV	ABOVE
AFF	ABOVE FINISH FLOOR
ARF	ABOVE REFERENCE FLOOR
ABR	ABRASIVE
ABS	ABSORBING
ACC	ACCESS
ACC PNL	ACCESS PANEL
AC	ACOUSTIC/ACOUSTICAL
ACT	ACOUSTIC TILE
AC INSUL	ACOUSTIC INSULATION
ADD	ADDENDUM
ADDN	ADDITION
ADDNL	ADDITIONAL
ADH	ADHESIVE
ADJ	ADJUSTABLE
AGGR	AGGREGATE
ACB	AIR CIRCUIT BREAKER
A/C	AIR CONDITIONING
ACC	AIR CONDITIONING COMPRESSOR
ACU	AIR CONDITIONING UNIT
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM/AL	ALUMINUM
AMT	AMOUNT
AMP	AMPHERE
AMPL	AMPLIFIER
ANCH	ANCHOR
AB	ANCHOR BOLT
&	AND
ANGL	ANGLE
ANOD	ANODIZED
APT	APARTMENT
APPR	APPROVED
APPROX	APPROXIMATE
ARCH	ARCHITECT/ARCHITECTURAL
A-	ARCHITECTURAL DRAWING-NO
AT	ASH TRAY
ATM	AUTOMATIC TELLER MACHINE
ASPH	ASPHALT
ASBY	ASSEMBLY
@	AT
AUTO	AUTOMATIC
ASR	AUTOMATIC SPRINKLER RISER
AUX	AUXILIARY
AVG	AVERAGE

B

B/B	BACK-TO-BACK
BFP	BACK FLOW PREVENTER
BDD	BACK DRAFT DAMPER
BF	BARRIER FREE
BBR	BASE BOARD RADIATION
BPL	BASE PLATE
BSMT	BASEMENT
B	BATH ROOM
BM	BEAM
B/C	BACK OF CURB
BRG	BEARING
BR	BEDROOM
BM	BENCH MARK
BT	BENT
BETW	BETWEEN
BEV	BEVEL
BIT	BITUMINOUS
BI	BLACK-IRON
BLK	BLOCK
BLKG	BLOCKING
BD	BOARD
BLR	BOILER
BLR F	BOILER FEED
BLR H	BOILER HOUSE
BK SH	BOOK SHELVES
BS	BOTH SIDES
BW	BOTH WAYS
BOT	BOTTOM
BOT EL	BOTTOM ELEVATION
BLVD	BOULEVARD
BDRY	BOUNDARY
BRKT	BRACKET
BR	BRASS
BRKR	BREAKER
BRK	BRICK
BTU	BRITISH THERMAL UNIT
BRZ	BRONZE
BLDG	BUILDING
BL	BUILDING LINE
BUR	BUILT-UP ROOFING
BN	BULLNOSE
BLKD	BULKHEAD
BULL	BULLETIN
BA	BURGLAR ALARM
BUZZ	BUZZER

C

CAB	CABINET
CUH	CABINET UNIT HEATER
CAP	CAPACITY
CPT	CARPET
CRS	CARPET REDUCER STRIP
CSMT	CASEMENT
CSWRK	CASEWORK
CSG	CASING
CI	CAST IRON
CIF	CAST IRON FRAME
CIP	CAST IRON PIPE/CAST IN PLACE
CSTG	CASTING
CAT NO	CATALOG NUMBER
CB	CATCH BASIN
CLG	CEILING
CD	CEILING DIFFUSER
CLG HT	CEILING HEIGHT
CEM	CEMENT
CEM PLAS	CEMENT PLASTER
CTR	CENTER
C/C	CENTER-TO-CENTER
CER	CERAMIC
CT	CERAMIC TILE
CBD	CHALKBOARD
CHAM	CHAMFER
CHG	CHANGE
CHAN	CHANNEL
CHKD PL	CHECKERED PLATE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CHD	CHORD
CIRCUM	CIRCUMFERENCE
CIR	CIRCLE/CIRCULAR
CIRC	CIRCUIT
CBR	CIRCUIT BREAKER
C-	CIVIL DRAWING-NO
CL	CLASS
CLRM	CLASSROOM
CO	CLEAN OUT
CLR	CLEAR
CLR GL	CLEAR GLASS
CLR WGL	CLEAR WIRE GLASS
CL	CLOSET
CLO	CLOSURE
CCL	COAT CLOSET
COEF	COEFFICIENT
CW	COLD WATER
COL	COLUMN
CO	COMPANY
COMPT	COMPARTMENT
COMPO	COMPOSITION
CA	COMPRESSED AIR
COMPR	COMPRESSOR
CONC	CONCRETE
CMU	CONCRETE MASONRY UNIT
CWR	CONDENSING WATER RETURN
CWS	CONDENSING WATER SUPPLY
COND	CONDUIT
CONF	CONFERENCE
CONN	CONNECT
CONST	CONSTRUCTION
CJ	CONTROL JOINT
CONT	CONTINUE/CONTINUOUS
CONTR	CONTRACTOR
CP	CONTROL PANEL
CONV	CONVECTOR
CNVYR	CONVEYOR
COR	CORNER
CG	CORNER GUARD
CORR	CORRIDOR/CORRUGATED
CPR	COPPER
CNTR	COUNTER
CTSK	COUNTERSINK
CRS	COURSE
COV	COVER
COV PL	COVER PLATE
CCT	CUBICAL CURTAIN TRACK
CUFT	CUBIC FEET/CUBIC FOOT
CFM	CUBIC FEET PER MINUTE
CY	CUBIC YARD
CULV	CULVERT
CD	CUP DISPENSER
CYL	CYLINDER
CYC	CYCLES

D

DMPR	DAMPER
DMPFG	DAMPPROOFING
DL	DEAD LOAD
DB	DECIBLE
D	DEEP
DGL	DOOR GLAZING
DWG	DRAWING
DMT PARTN	DEMOUNTABLE PARTITION
DEPT	DEPARTMENT
DEPR	DEPRESSED
DES	DESIGN
DET	DETAIL
DE CO	DETROIT EDISON COMPANY
DIAG	DIAGONAL
DGM	DIAGRAM
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DR	DINING ROOM
DIR	DIRECTORY
DISC	DISCONNECT
DISCONT	DISCONTINUOUS
DW	DISHWASHER
DISP	DISPENSER
DIST	DISTANCE
DP	DISTRIBUTION PANEL
DO	DITTO (DO OVER)
DIV	DIVIDER/DIVISION
DR	DOOR
DH	DOOR OPENING
DR OP	DOOR OPERATOR
DBL	DOUBLE
DA	DOUBLE ACTING
DH	DOUBLE HUNG
DWL	DOWEL
DN	DOWN
DS	DOWNSPOUT
DRN	DRAIN
DT	DRAIN TILE
DTC	DRAIN TILE CONNECTOR
DWR	DRAWER
DF	DRINKING FOUNTAIN
DB	DRY BULB
DSP	DRY STAND PIPE
DBWTR	DUMBWAITER
DUP	DUPLICATE
DDR	DUTCH DOOR

E

EA	EACH
EF	EACH FACE
EW	EACH WAY
E	EAST
EIFS	EXTERIOR INSULATION FINISH SYSTEM
ELAST	ELASTOMERIC
ELAST FLASH	ELASTOMERIC FLASHING
ELAST WP	ELASTOMERIC WATERPROOFING
ESR	ELASTOMERIC SHEET ROOFING
ELEC	ELECTRIC/ELECTRICAL
ELEC CL	ELECTRICAL CLOSET
ELEC CAB	ELECTRICAL CABINET
EC	ELECTRICAL CONTRACTOR
E-	ELECTRICAL DRAWING-NO
EP	ELECTRICAL PANEL
EWC	ELECTRICAL WATER COOLER
ELEC OPER	ELECTRICALLY OPERATED
EL	ELEVATION
ELEV	ELEVATOR
EMERG	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
E/E	END-TO-END
ENTR	ENTRANCE/ENTRY
EP	EPOXY
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ESC	ESCALATOR
EST	ESTIMATE
EXC	EXCAVATED
EXH	EXHAUST
ED	EXHAUST DUCT
EF	EXHAUST FAN
EG	EXHAUST GRILLE
ER	EXHAUST REGISTER
EXIST	EXISTING
EXP	EXPANSION
EXPB	EXPANSION BOLT
EJ	EXPANSION JOINT
EXPLP	EXPLOSION PROOF
EXPD	EXPOSED
EXTN	EXTENSION
EXT	EXTERIOR
EH	EXTRA HEAVY
EXTR	EXTRUDED
ESP	EXTERNAL STATIC PRESSURE

F

FAB	FABRICATED/FABRIC
F/F	FACE-TO-FACE
FFIN	FACTORY FINISH
FCU	FAN COIL UNIT
FS	FAR SIDE
FAS	FASTENER
FDR	FEEDER
FT or '	FEET/FOOT
FPM	FEET PER MINUTE
FN	FENCE
FBD	FOAM BOARD
FIG	FIGURE
FIN	FINISH/FINISHED
FIN FLR/FF	FINISHED FLOOR
FTR	FINNED TUBE RADIATION
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
F BRK	FIRE BRICK
FD	FIRE DAMPER
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
FH	FIRE HYDRANT
FL	FIRE LINE
FR	FIRE RETARDANT/FIRE RATED
FRTWD	FIRE RETARDANT TREATED WOOD
FVC	FIRE VALVE CABINET
FP	FIREPLACE
FPRFG	FIREPROOFING
FIXT	FIXTURE
FLASH	FLASHING
FHMS	FLAT HEAD MACHINE SCREW
FWMS	FLAT HEAD WOOD SCREW
FC	FLEXIBLE CONNECTION
FLR	FLOOR
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FLR FIN	FLOOR FINISH
FLUOR	FLUORESCENT
FLDG	FOLDING
FTG	FOOTING
FM BD	FOAMBOARD
FDN	FOUNDATION
FR	FRAME
FR/COV	FRAME AND COVER
FRMG	FRAMING
FRZR	FREEZER
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FULL SIZE
FURN	FURNISH/FURNISHED
FURR	FURRING/FURRED
FUT	FUTURE

G

GA	GAUGE
GAL	GALLON
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GALV	GALVANIZED
GALV I	GALVANIZED IRON
G	GAS
GSKT	GASKET
GV & B	GATE VALVE AND BOX
GENL	GENERAL
GL	GLASS
GLZ	GLAZING
GHT	GLAZED HOLLOW TILE
GB	GRAB BAR
GR	GRADE/GRILLE
GB	GRADE BEAM
GRAT	GRATING
GL	GRID LINE
GRN	GRANITE
GS	GREASE SEPARATOR
FT	GREASE TRAP
GND	GROUND
GFI	GROUND FAULT INTERRUPTOR
GT	GROUT
G	GUTTER ELEVATION
GYP	GYPSUM
GYPBD	GYPSUM BOARD

H

HNDCP	HANDICAPPED
HR	HANDRAIL
HBD	HARDBOARD
HDWE	HARDWARE
HDWD	HARDWOOD
HD	HEAD
HDR	HEADER
HA GL	HEAT ABSORBING GLASS
HRU	HEAT RECOVERY UNIT
HTR	HEATER
HTG	HEATING
HV	HEATING AND VENTILATING
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HHWR	HEATING HOT WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HGT	HEIGHT
HEX	HEXAGON
H	HIGH
HID	HIGH INTENSITY DISCHARGE
HP	HIGH POINT
HPR	HIGH PRESSURE
HS	HIGH STRENGTH
HSB	HIGH STRENGTH BOLT
HV	HIGH VOLTAGE
HWY	HIGHWAY
HSTWY	HOISTWAY
HC	HOLLOW CORE
HM	HOLLOW METAL
HNYCB	HONEYCOMB
HK	HOOK
HORIZ	HORIZONTAL
HP	HORSEPOWER
HB	HOSE BIBB
HSP	HOSE STAND PIPE
HVC	HOSE VALVE CABINET
HOSP	HOSPITAL
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HR	HOUR
HO	HUB OUTLET
HYD	HYDRANT/HYDRAULIC
H	HYDROGEN

I

ID	IDENTIFICATION
INCAND	INCANDESCENT
IN OR "	INCHINCHES
INCIN	INCINERATOR
INCL	INCLUDE / INCLUDING
IW	INDIRECT WASTE
INFO	INFORMATION
ID	INSIDE DIAMETER
IF	INSIDE FACE
INSTL	INSTALL/INSTALLATION
INSUL	INSULATE/INSULATION
INT	INTERIOR
INTER	INTERMEDIATE
INV	INVERT
IE	INVERT ELEVATION

J

JC	JANITOR CLOSET
JT	JOINT
JST	JOIST
JB	JUNCTION BOX
JR	JUNIOR

K

KP	KICK PLATE
KV	KILOVOLT
KVA	KILOVOLT AMHERE
KW	KILOWATT
K	KIP (1008)
KIT	KITCHEN
KS	KNEE SPACE
KD	KNOCK DOWN
KOP	KNOCK-OUT PANEL

L

LBL	LABEL
LAB	LABORATORY
LAD	LADDER
LB	LAG BOLT
LAM	LAMINATE/LAMINATED
LDG	LANDING
L-	LANDSCAPE DRAWING-NO
LGE	LARGE
LDRY	LAUNDRY
LAV	LAVATORY
LH	LEFT HAND
LHRB	LEFT HAND REVERSE BEVEL
LGTH	LENGTH
LEV	LEVEL
LIB	LIBRARY
LT	LIGHT
LPRF	LIGHTPROOF
LTG	LIGHTING
LP	LIGHTING PANEL
LRP	LIGHTING RECEPTACLE PANEL
LTWT	LIGHTWEIGHT
LTWT CONC	LIGHTWEIGHT CONCRETE
LMS	LIMESTONE
LTL	LINTEL
LIN DIFF	LINEAR DIFFUSER
LF	LINEAR FEET/FOOT
LIN SD	LINEAR SLOT DRAIN
LIQ	LIQUID
LPG	LIQUID PROPANE GAS
LPG	LIQUID PETROLEUMM GAS
LL	LIVE LOAD
LR	LIVING ROOM
LOC	LOCATION
LKR	LOCKER
LG	LONG
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LVR	LOUVER
LO	LOUVER OPENING
LP	LOW POINT
LPR	LOW PRESSURE
LBR	LUMBER
LBS OR #	POUNDS

M

MACH	MACHINE
MB	MACHINE BOLT
MACH RM	MACHINE ROOM
MAU	MAKE-UP AIR UNIT
MDP	MAIN DISTRIBUTION PANEL
MSB	MAIN SWITCHBOARD
MAINT	MAINTENANCE
MH	MANHOLE
MFR	MANUFACTURER
MAR	MARBLE
MK	MARK
MAS	MASONRY
MO	MASONRY OPENING
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
M-	MECHANICAL DRAWING-NO
MC	MEDICINE CABINET
MED	MEDIUM
MEMB	MEMBRANE
MET	METAL
MDS	METAL DIVIDER STRIP
MES	METAL EDGE STRIP
ML	METAL LATH
ML & PLAS	METAL LATH AND PLASTER
MT	METAL THRESHOLD
MET WP	METALLIC WATERPROOFING
MEZZ	MEZZANINE
MDOT	MICHIGAN DEPARTMENT OF TRANSPORTATION
MWK	MILLWORK
MIN	MINIMUM
MIR	MIRROR
M&S	MIRROR AND SHELF
MOD	MOTOR OPERATED DAMPER
MLDG	MOULDING
MTD	MOUNTED
MTG	MEETING/MOUNTING
MOV	MOVEABLE
MOV PARTN	MOVEABLE PARTITION
MULL	MULLION
M	THOUSAND (1000)

N

NAT	NATURAL
NS	NEAR SIDE
NEUT	NEUTRAL
NRC	NOISE REDUCTION COEFFICIENT
NOM	NOMINAL
NOR	NORMAL
N	NORTH
NOS	NOSING
NIC	NOT-IN-CONTRACT
NTS	NOT-TO-SCALE
NO OR #	NUMBER

O

OBS	OBSCURE
OBSGL	OBSCURE GLASS
OFF	OFFICE
OC	ON CENTER
OPQ	OPAQUE
OPG	OPENING
OPER	OPERATOR
OPP	OPPOSITE
OPP HD	OPPOSITE HAND
ORIG	ORIGINAL
ORN	ORNAMENTAL
OZ	OUNCE
O/O	OUT-TO-OUT
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OHS	OVAL HEAD SCREW
OA	OVERALL
OHD	OVERHEAD
OHDOR	OVERHEAD DOOR
OXY	OXYGEN

P

PTD	PAINTED
PR	PAIR
PG	PAGE
PNL	PANEL
PTD	PAPER TOWEL DISPENSER
PTWR	PAPER TOWEL WASTE RECEPTACLE
PRL	PARALLEL
PKG	PARKING
PBD	PARTICLE BOARD
PRTN	PARTITION
PASS	PASSAGE
PAT	PATENT
PVMT	PAVEMENT
PVG	PAVING
PED	PEDESTAL
PERF	PERFORATED
PERIM	PERIMETER
PERM	PERMANENT
PERP	PERPENDICULAR
P	PHASE
PHOTO	PHOTOGRAPH
PH	PHYSICALLY HANICAPPED
PC	PIECE
PCS	PIECES
PLAS	PLASTER
PL LAM	PLASTIC LAMINATE
PL	PLATE
PL GL	PLATE GLASS
PLAT	PLATFORM
PLBG	PLUMBING
PLWD	PLYWOOD
PT	POINT
PT	POINT OF TANGENCY
PC	POINT OF CURVATURE
POL	POLISH/POLISHED
PVC	POLYVINYLCLORIDE
PORC	PORCELAIN
PORC ENAM	PORCELAIN ENAMEL
POR	POROUS
PORT	PORTABLE
POS	POSITION
PIV	POST INDICATOR VALVE
PLF	POUNDS PER LINEAR FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PCF	POUNDS PER CUBIC FOOT
PP	POWER PANEL
P/C	PRECAST
PTR	PRECAST TERRAZZO RECEPTOR
PREFAB	PREFABRICATED
PFN	PREFINISHED
PTWD	PRESERVATIVE TREATED WOOD
PG	PRESSURE GAUGE
PRV	PRESSURE REDUCING VALVE
PRIM	PRIMARY
PROJ	PROJECT/PROJECTION
PROP	PROPERTY/PROPOSED
PL	PROPERTY LINE
PA	PUBLIC ADDRESS
PS	PURSE SHELF
PB	PUSH BUTTON

Q

QTY	QUANTITY
QT	QUARRY TILE
QTR	QUARTER
QTR RD	QUARTER ROUND

R

RBT	RABBET
RAD or R	RADIUS
RWC	RAIN WATER CONDUCTOR
RR	RAILROAD
RECV	RECEIVE/RECEIVING
RECPT	RECEPTACLE
RP	RECEPTACLE PANEL
REC	RECESS
RECT	RECTANGLE/RECTANGULAR
RED	REDUCER
RWD	REDWOOD
REF	REFER/REFERENCE
REFL	REFLECTED/REFECTIVE
REFR	REFRIGERATOR
REG	REGISTER
REINF	REINFORCE/REINFORCING/ REINFORCEMENT
REM	REMOVE/REMOVABLE
REP	REPAIR
REQ'D	REQUIRED
RESIL	RESILIENT
RET	RETURN
PA	RETURN AIR
RAD	RETURN AIR DIFFUSER
RAF	RETURN AIR FAN
REV	REVISED/REVISION
RPM	REVOLUTIONS PER MINUTE
R	RISER
RH	RIGHT HAND
RHRB	RIGHT HAND REVERSE BEVEL
ROW	RIGHT OF WAY
RVT	RIVET
RD	ROAD
RSC	ROLLING STEEL CURTAIN
RF	ROOF
RC	ROOF CONDUCTOR
RD	ROOF DRAIN
RFH	ROOF HATCH
RS	ROOF SUMP
RV	ROOF VENTILATOR
RFG	ROOFING
RTU	ROOF TOP UNIT
RM	ROOM
RO	ROUGH OPENING
RND	ROUND
RHMS	ROUND HEAD MACHINE SCREW
RHWS	ROUND HEAD WOOD SCREW
RT	RUBBER TILE

S

SAN	SANITARY
SND	SANITARY NAPKIN DISPENSER
SNR	SANITARY NAPKIN RECEPTACLE
SCHED	SCHEDULE
SCN	SCREEN
STG	SEATING
SECT	SECTION
SERV	SERVICE
SS	SERVICE SINK
SHTHG	SHEATHING
SHT	SHEET
SHT MET	SHEET METAL
SH & R	SHELF AND ROD
SHWR	SHOWER
SCR	SHOWER CURTAIN ROD
SDR	SHOWER DOOR
SW	SIDEWALK
SIM	SIMILAR
SGL	SINGLE
SK	SINK
SD	SOAP DISPENSER
SC	SOLID CORE
SS	SOLID SURFACE
STC	SOUND TRANSMISSION CLASS
S	SOUTH
SP	SPACE
SPR	SPARE
SPKR	SPEAKER
SPEC	SPECIFICATIONS
SD	SPLITTER DAMPER
SPRYD	SPRAYED
SPNKLR	SPRINKLER
SQ	SQUARE
SF	SQUARE FEET/SQUARE FOOT
STAG	STAGGERED
STSTL	STAINLESS STEEL
STD	STANDARD
SP	STANDPIPE
SP	STATIC PRESSURE
STA	STATION
STM	STEAM
STL	STEEL
STL PL	STEEL PLATE
STIFF	STIFFENER
STO FR	STOREFRONT
STOR	STORAGE
STR	STRAIGHT
ST	STREET
STRUCT	STRUCTURAL
S-	STRUCTURAL DRAWING-NO
SGFT	STRUCTURAL GLAZED FACING TILE
SSTL	STRUCTURAL STEEL
SSD	SUBSOIL DRAIN
SSDC	SUBSOIL DRAIN CONNECTION
SUB	SUBSTATION
SAG	SUPPLY AIR GRILLE
SD	SUPPLY DIFFUSER/DUCT
SUBST	SUBSTITUTE
SAR	SUPPLY AIR REGISTER
SF	SUPPLY FAN
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMBOL/SYMMETRICAL
SYS	SYSTEM
SUPP	SUPPORT
SURF	SURFACE/SURFACING
SUSP	SUSPEND/SUSPENSION

T

TBD	TACKBOARD
TAN	TANGENT
TECH	TECHNICAL
TEL	TELEPHONE
TEL CAB	TELEPHONE CABINET
TV	TELEVISION
TVM	TELEVISION MONITOR
TEMP	TEMPERATURE
TEMP GL	TEMPERED GLASS
TU	TERMINAL UNIT
TERR	TERRAZZO
TB	TEST BORING
T	THERMOSTAT
THK	THICK/THICKNESS
TS	THICKENED SLAB
THD	THREAD
THRESH	THRESHOLD
THRU	THROUGH
T/TOIL	TOILET
TPD	TOILET PAPER DISPENSER
TPH	TOILET PAPER HOLDER
T & G	TOUNGE AND GROOVE
T & B	TOP AND BOTTOM
T/C	TOP OF CURB
T/EL	TOP ELEVATION
T/F	TOP OF FOOTING
T/G	TOP OF GUTTER
T/M	TOP OF MASONRY
T/P	TOP OF PARAPET
T/P	TOP OF PAVEMENT
T/R	TOP OF RIM
T/S	TOP OF STEEL
T/W	TOP OF WALL
TB	TOWEL BAR
TD	TOWEL DISPENSER
TD & WR	TOWEL DISPENSER AND WASTE RECEPTACLE
TG	TRANSFER GRILLE
TRFR	TRANSFORMER
TRAN	TRANSOM
T	TREAD
TD	TRENCH DRAIN
TS	TUBE SECTION
TV	TURNING VANE
TT	TWIN TEE
TYP	TYPICAL

U

UC	UNDERCUT
UG	UNDER GROUND
UL	UNDERWRITERS LABORATORY
ULT	ULTIMATE
UNFIN	UNFINISHED
UH	UNIT HEATER
USUB	UNIT SUBSTATION
UV	UNIT VENTILATOR
USGS	UNITED STATES GEOLOGICAL SURVEY
UON	UNLESS OTHERWISE NOTED
UR	URINAL

V

VAC	VACUUM
VB	VACUUM BREAKER
VCO	VACUUM CLEANER OUTLET
V BARR	VAPOR BARRIER
VAR	VARIABLE
VARN	VARNISH
VNR	VENEER
V PLAS	VENEER PLASTER
V	VENT
VTR	VENT THRU ROOF
VENT	VENTILATE/VENTILATION
VIF	VERIFY IN FIELD
VS	VERSUS
VERT	VERTICAL/VERTICALLY
VERT C	VERTICAL CURVE
VEST	VESTIBULE
VI	VIBRATION ISOLATOR
VINY	VINYL
VCT	VINYL COMPOSITION TILE
VIN FAB	VINYL FABRIC
VRS	VINYL REDUCER STRIP
VIT	VITREOUS
VCP	VITRIFIED CLAY PIPE
VOL	VOLUME
VD	VOLUME DAMPER
V	VOLTS

W

WAINS	WAINSCOT
WCAB	WALL CABINET
WCO	WALL CLEAN OUT
WH	WALL HYDRANT
WW	WALL-TO-WALL
WV	WALL VENT
WHSE	WAREHOUSE
WF	WASH FOUNTAIN
W	WASTE/WATTS
W & V	WASTE AND VENT
WR	WASTE RECEPTACLE
WC	WATER CLOSET
WG	WATER GUAGE
WH	WATER HEATER
WP	WATERPROOFING
WSTPG	WEATHERSTRIPPING
WT	WEIGHT
WWF	WELDED WIRE FABRIC
W	WEST
WB	WET BULB
W	WIDE/WIDTH
W_x_	WIDE FLANGE SECTION
WT	WIDE FLANGE TEE SECTION
WO	WINDOW OPENING
WGL	WIRE GLASS
WM	WIRE MESH
w/	WITH
w/o	WITHOUT
WD	WOOD
WL	WORK LINE
WP	WORK POINT
WI	WROUGHT IRON

X

Y

YD	YARD
YP	YIELD POINT
YS	YIELD STRENGTH
YR	YEAR

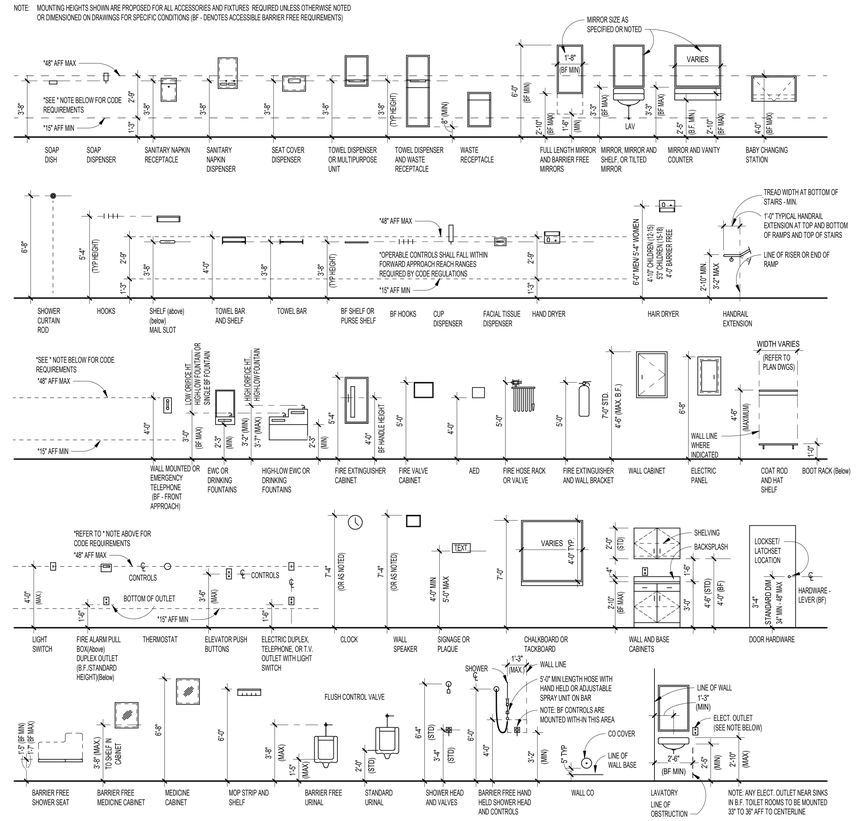
Z

ZC	ZINC

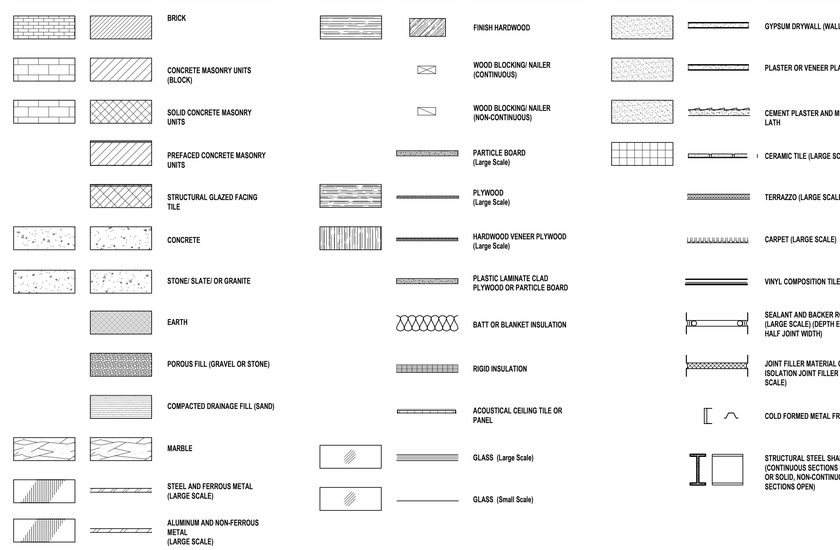
TYPICAL MOUNTING HEIGHTS

MISCELLANEOUS ACCESSORIES, TOILET ACCESSORIES AND FIXTURES

NOTE: MOUNTING HEIGHTS SHOWN ARE PROPOSED FOR ALL ACCESSORIES AND FIXTURES REQUIRED UNLESS OTHERWISE NOTED OR DIMENSIONED ON DRAWINGS FOR SPECIFIC CONDITIONS (BF - DENOTES ACCESSIBLE BARRIER FREE REQUIREMENTS)

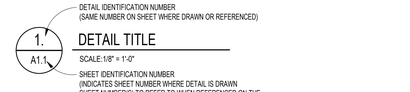


MATERIAL DESIGNATIONS



REFERENCE

DETAIL



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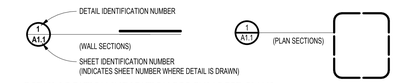
DETAIL IDENTI

MECHANICAL ABBREVIATION LIST

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

ABBREVIATION	DESCRIPTION
FD	FLOOR DRAIN
FFD	FUNNEL FLOOR DRAIN
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FHV	FIRE HOSE VALVE
FLA	FULL LOAD AMPS
FLR	FLOOR
FM	FLOW METER
FMS	FLOW MEASURING STATION
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
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 AGENCY
NOTC	NORMALLY OPEN TIMED CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPCW	NON POTABLE COLD WATER

ABBREVIATION	DESCRIPTION
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
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAUGE
PST	PUMPED STORM
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 DETECTION ASSY
RPZA	REDUCED PRESSURE BACKFLOW 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
SCCA	SHORT CIRCUIT CURRENT RATING
SECT	SECTION
SF	SUPPLY FAN
SH	SHOWER
SK	SINK
SMR	SNOW MELT RETURN
SMS	SNOW MELT SUPPLY
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SPKLR	SPRINKLER
SQFT	SQUARE FOOT/SQUARE FEET
S/S	START/STOP
SS	SERVICE SINK
ST	STORM
STD	STANDARD
STK	STACK
STM	STEAM
STM(__#)	STEAM (SPECIFIC PSIG)
S/W	SUMMER/WINTER
SW	SWITCH
T	TRANSFER GRILLE
TC	TEMPERATURE CONTROL
TC	TEMPERING COIL
TCP	TEMPERATURE CONTROL PANEL
TD	TRENCH DRAIN
TEMP	TEMPERATURE
TEMP	TEMPORARY
TH	TERMINAL HEATING
THA	TOTAL HEAT ABSORBED
THR	TERMINAL HEATING RETURN
THR	TOTAL HEAT REJECTED
THS	TERMINAL HEATING SUPPLY
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		VALVE - 2 WAY CONTROL VALVE
	GUARD FOR STAT OR SENSOR		VALVE - 3 WAY CONTROL VALVE
H	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)	T	THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)

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

MECHANICAL SYMBOL LIST

PIPING SYMBOLS

SYMBOL	DESCRIPTION
AV	AIR VENT - AUTOMATIC
MV	AIR VENT - MANUAL
BFP	BACKFLOW PREVENTER
	CATCH BASIN
	CIRCULATING PUMP
CO	CLEAN OUT - IN FLOOR
CO	CLEAN OUT - FLANGE
	DIRECTION OF FLOW
	DIRECTION OF PITCH - DOWN
	FINNED TUBE RADIATION
	FIRE PROTECTION - SIAMESE CONNECTION - FREE STANDING
	FIRE PROTECTION - SIAMESE CONNECTION - WALL MOUNTED
	FIRE PROTECTION - SPRINKLER HEAD, CONCEALED
	FIRE PROTECTION - SPRINKLER HEAD, PENDANT
	FIRE PROTECTION - SPRINKLER HEAD, UPRIGHT
	FIRE PROTECTION - SPRINKLER HEAD, SIDEWALL
	FLOOR DRAIN
	FLOOR DRAIN - ELEVATION
	FLOOR DRAIN - FUNNEL
	FLOOR DRAIN - FUNNEL, ELEVATION
	FLOW MEASURING DEVICE (FOR TEST AND BALANCING)
FS	FLOW SWITCH
FM	FLOW METER
HB	HOSE BIBB
MH	MANHOLE
	OPEN SITE DRAIN
	PIPE - ANCHOR
	PIPE - CAP OR PLUG
	PIPE - ELBOW DOWN
	PIPE - ELBOW UP
	PIPE - EXPANSION JOINT OR COMPENSATOR
	PIPE - FLANGE
	PIPE - HOSE AND BRAID FLEXIBLE CONNECTION
	PIPE - RUBBER FLEXIBLE CONNECTION
	PIPE - GUIDE
	PIPE - TEE DOWN
	PIPE - TEE UP
	PIPE - UNION
PT	PRESSURE AND TEMPERATURE TEST PLUG
	PRESSURE GAUGE AND COCK
	REDUCER - CONCENTRIC
	REDUCER - ECCENTRIC
	ROOF/OVERFLOW DRAIN
	STEAM TRAP - FLOAT AND THERMOSTATIC
	STRAINER
	STRAINER WITH VALVE AND BLOW-OFF
	THERMOMETER
	TRAP
	VALVE - ANGLE
	VALVE - BALL
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)
0.5	VALVE - BUTTERFLY
	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
WM	WATER METER
GM	GAS METER

DOUBLE LINE PIPING SYMBOLS

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

DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
TU-101	AIR TERMINAL UNIT
TU-101	AIR TERMINAL UNIT WITH HEATING COIL
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)
BOD	DAMPER - BACK DRAFT
M	DAMPER - MOTORIZED
	DAMPER - VOLUME (MANUALLY ADJUSTABLE)
	DIFFUSER - BLANK OFF
	DIFFUSER - LINEAR SLOT
	DIFFUSER - SQUARE OR RECTANGULAR
	DUCT CROSS SECTION - SUPPLY
	DUCT CROSS SECTION - RETURN
	DUCT CROSS SECTION - EXHAUST
	DUCT - FLEXIBLE CONNECTION
	DUCT - FLEXIBLE DUCT
	DUCT TAKE-OFF - ROUND CONICAL
	DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	ELBOW - RECTANGULAR WITH TURNING VANES
	ELBOW - RECTANGULAR/ ROUND SMOOTH RADIUS
	ELBOW DOWN - RECTANGULAR
	ELBOW DOWN - ROUND
	ELBOW UP - RECTANGULAR
	ELBOW UP - ROUND
	FAN - AXIAL
	FAN - CENTRIFUGAL (ELEVATION)
	HEATING COIL
D	INCLINED DROP IN DIRECTION OF AIRFLOW
R	INCLINED RISE IN DIRECTION OF AIRFLOW
	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

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

MECHANICAL DRAWING INDEX

SHEET NO.	SHEET TITLE
M0.1	MECHANICAL STANDARDS AND DRAWING INDEX
M1.1	FIRST LEVEL FIRE PROTECTION COMPOSITE PLAN
M1.2	SECOND LEVEL FIRE PROTECTION COMPOSITE PLAN
M2.0A	UNDERGROUND PLUMBING PLAN - ZONE 'A'
M2.0B	UNDERGROUND PLUMBING PLAN - ZONE 'B'
M2.0C	UNDERGROUND PLUMBING PLAN - ZONE 'C'
M2.0D	UNDERGROUND PLUMBING PLAN - ZONE 'D'
M2.0E	UNDERGROUND PLUMBING PLAN - ZONE 'E'
M2.0F	UNDERGROUND PLUMBING PLAN - ZONE 'F'
M2.1A	FIRST LEVEL PLUMBING PLAN - ZONE 'A'
M2.1B	FIRST LEVEL PLUMBING PLAN - ZONE 'B'
M2.1C	FIRST LEVEL PLUMBING PLAN - ZONE 'C'
M2.1D	FIRST LEVEL PLUMBING PLAN - ZONE 'D'
M2.1E	FIRST LEVEL PLUMBING PLAN - ZONE 'E'
M2.1F	FIRST LEVEL PLUMBING PLAN - ZONE 'F'
M2.2C	MEZZANINE LEVEL PLUMBING PLAN - ZONE 'C'
M2.2D	SECOND LEVEL PLUMBING PLAN - ZONE 'D'
M2.2E	SECOND LEVEL PLUMBING PLAN - ZONE 'E'
M3.1A	FIRST LEVEL HVAC PIPING PLAN - ZONE 'A'
M3.1B	FIRST LEVEL HVAC PIPING PLAN - ZONE 'B'
M3.1C	FIRST LEVEL HVAC PIPING PLAN - ZONE 'C'
M3.1D	FIRST LEVEL HVAC PIPING PLAN - ZONE 'D'
M3.1E	FIRST LEVEL HVAC PIPING PLAN - ZONE 'E'
M3.1F	FIRST LEVEL HVAC PIPING PLAN - ZONE 'F'
M3.2C	MEZZANINE LEVEL HVAC PIPING PLAN - ZONE 'C'
M3.2D	SECOND LEVEL HVAC PIPING PLAN - ZONE 'D'
M3.2E	SECOND LEVEL HVAC PIPING PLAN - ZONE 'E'
M4.1A	FIRST LEVEL SHEET METAL PLAN - ZONE 'A'
M4.1B	FIRST LEVEL SHEET METAL PLAN - ZONE 'B'
M4.1C	FIRST LEVEL SHEET METAL PLAN - ZONE 'C'
M4.1D	FIRST LEVEL SHEET METAL PLAN - ZONE 'D'
M4.1E	FIRST LEVEL SHEET METAL PLAN - ZONE 'E'
M4.1F	FIRST LEVEL SHEET METAL PLAN - ZONE 'F'
M4.2C	MEZZANINE LEVEL SHEET METAL PLAN - ZONE 'C'
M4.2D	SECOND LEVEL SHEET METAL PLAN - ZONE 'D'
M4.2E	SECOND LEVEL SHEET METAL PLAN - ZONE 'E'
M5.1	ROOF MECHANICAL PLAN
M5.2	ENLARGED MECHANICAL PLANS
M6.1	MECHANICAL DETAILS
M6.2	MECHANICAL DETAILS
M6.3	MECHANICAL DETAILS
M6.4	MECHANICAL DETAILS
M6.5	MECHANICAL DETAILS
M6.6	MECHANICAL DETAILS

SHEET NO.	SHEET TITLE
M7.1	MECHANICAL SCHEDULES
M7.2	MECHANICAL SCHEDULES
M7.3	MECHANICAL SCHEDULES
M7.4	MECHANICAL SCHEDULES
M7.5	MECHANICAL SCHEDULES
M7.6	MECHANICAL SCHEDULES
M7.7	MECHANICAL SCHEDULES
M8.1	TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES
M8.2	TEMPERATURE CONTROLS
M8.3	TEMPERATURE CONTROLS
M8.4	TEMPERATURE CONTROLS
M8.5	TEMPERATURE CONTROLS
M8.6	TEMPERATURE CONTROLS
M8.7	TEMPERATURE CONTROLS
M8.8	TEMPERATURE CONTROLS
M8.9	TEMPERATURE CONTROLS
M8.10	TEMPERATURE CONTROLS
M8.11	TEMPERATURE CONTROLS

STANDARD METHODS OF NOTATION

S-1 10ø 350-4	SUPPLY DIFFUSER WITH SCHEDULE TAG "1", 10" DIAMETER NECK SIZE 350 CFM TYPICAL FOR 4
R-1 22x22 640	RETURN REGISTER WITH SCHEDULE TAG "1", 22"x 22" NECK SIZE 640 CFM TYPICAL FOR 2 EXHAUST REGISTER E DESIGNATION SIMILAR.
TU-101	AIR TERMINAL UNIT WITH HEATING COIL NO. 101 WITH SERVICE CLEARANCE SHOWN
VTU-101	VENTURI AIR TERMINAL WITH HEATING COIL NO. 101 WITH SERVICE CLEARANCE SHOWN
(2)WC-1 FD-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
1 M5.1	AREA OF ENLARGEMENT PLAN NUMBER SHEET WHERE ENLARGED PLAN IS DRAWN
1 M5.1	SECTION OR PLAN NUMBER SECTION OR ENLARGED PLAN SCALE: 1/8" = 1' - 0" SHEET WHERE SECTION IS CUT OR ENLARGED PLAN IS REFERENCED
SHEET M1.0 SHEET M1.1	MATCHLINE
	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.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

MECHANICAL STANDARDS AND DRAWING INDEX

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	KLH
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M0.1

6/17/2024 12:56:23 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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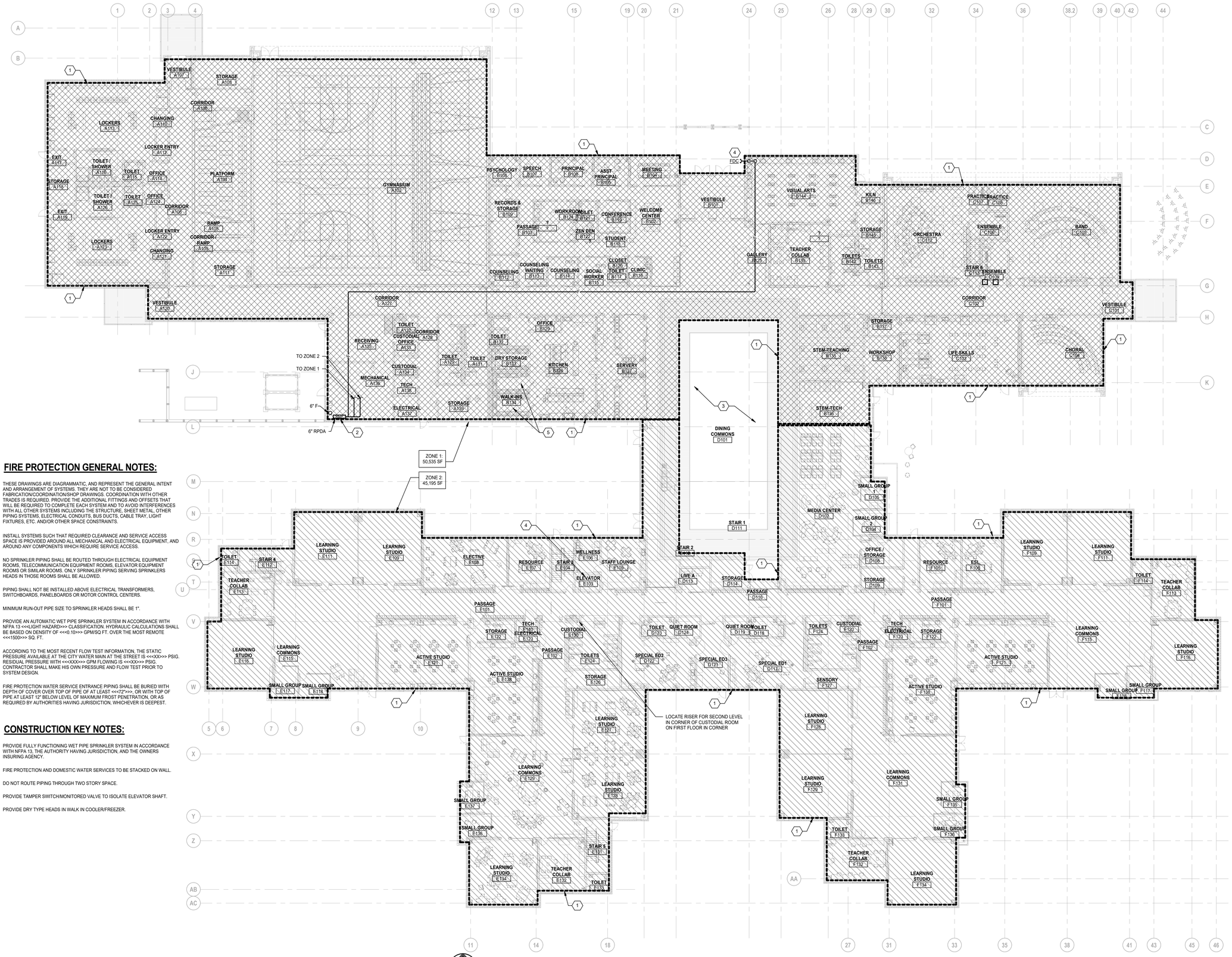

FIRE PROTECTION GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 NO SPRINKLER PIPING SHALL BE ROUTED THROUGH ELECTRICAL EQUIPMENT ROOMS, TELECOMMUNICATION EQUIPMENT ROOMS, ELEVATOR EQUIPMENT ROOMS OR SIMILAR ROOMS. ONLY SPRINKLER PIPING SERVING SPRINKLERS HEADS IN THOSE ROOMS SHALL BE ALLOWED.

4 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

5 MINIMUM RUN-OUT PIPE SIZE TO SPRINKLER HEADS SHALL BE 1".

6 PROVIDE AN AUTOMATIC WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13 <<<LIGHT HAZARD>>> CLASSIFICATION. HYDRAULIC CALCULATIONS SHALL BE BASED ON DENSITY OF <<<0.10>>> GPM/SQ FT. OVER THE MOST REMOTE <<<1500>>> SQ. FT.

7 ACCORDING TO THE MOST RECENT FLOW TEST INFORMATION, THE STATIC PRESSURE AVAILABLE AT THE CITY WATER MAIN AT THE STREET IS <<<XX>>> PSIG. RESIDUAL PRESSURE WITH <<<XXX>>> GPM FLOWING IS <<<XX>>> PSIG. CONTRACTOR SHALL MAKE HIS OWN PRESSURE AND FLOW TEST PRIOR TO SYSTEM DESIGN.

8 FIRE PROTECTION WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST <<<72">>>, OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1 PROVIDE FULLY FUNCTIONING WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13, THE AUTHORITY HAVING JURISDICTION, AND THE OWNERS INSURING AGENCY.

2 FIRE PROTECTION AND DOMESTIC WATER SERVICES TO BE STACKED ON WALL.

3 DO NOT ROUTE PIPING THROUGH TWO STORY SPACE.

4 PROVIDE TAMPER SWITCH/MONITORED VALVE TO ISOLATE ELEVATOR SHAFT.

5 PROVIDE DRY TYPE HEADS IN WALK IN COOLER/FREEZER.

FIRST LEVEL FIRE PROTECTION PLAN

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

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PBA Project No.: 2023.0154

PROJECT TITLE

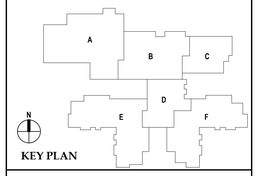
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL FIRE PROTECTION COMPOSITE PLAN



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M1.1

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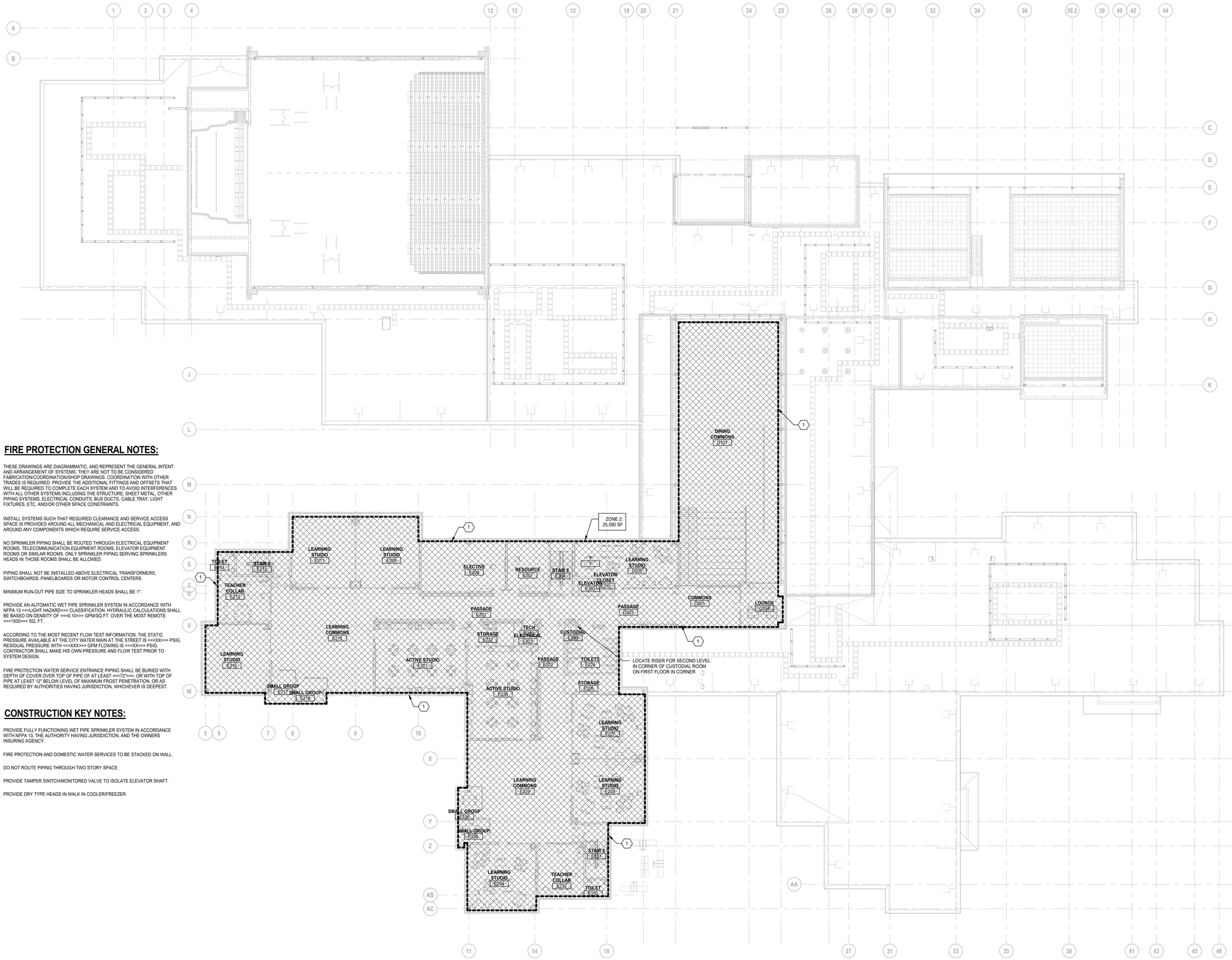

FIRE PROTECTION GENERAL NOTES:

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5 MINIMUM RUN-OUT PIPE SIZE TO SPRINKLER HEADS SHALL BE 1".

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CONSTRUCTION KEY NOTES:

1 PROVIDE FULLY FUNCTIONING WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13, THE AUTHORITY HAVING JURISDICTION, AND THE OWNERS INSURING AGENCY.

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3 DO NOT ROUTE PIPING THROUGH TWO STORY SPACE.

4 PROVIDE TAMPER SWITCH/MONITORED VALVE TO ISOLATE ELEVATOR SHAFT.

5 PROVIDE DRY TYPE HEADS IN WALK IN COOLER/FREEZER.

SECOND AND MEZZININE LEVEL FIRE PROTECTION PLAN

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

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PROJECT TITLE

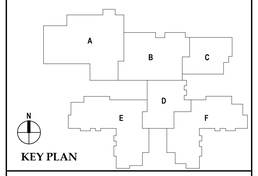
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL FIRE PROTECTION COMPOSITE PLAN



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M1.2

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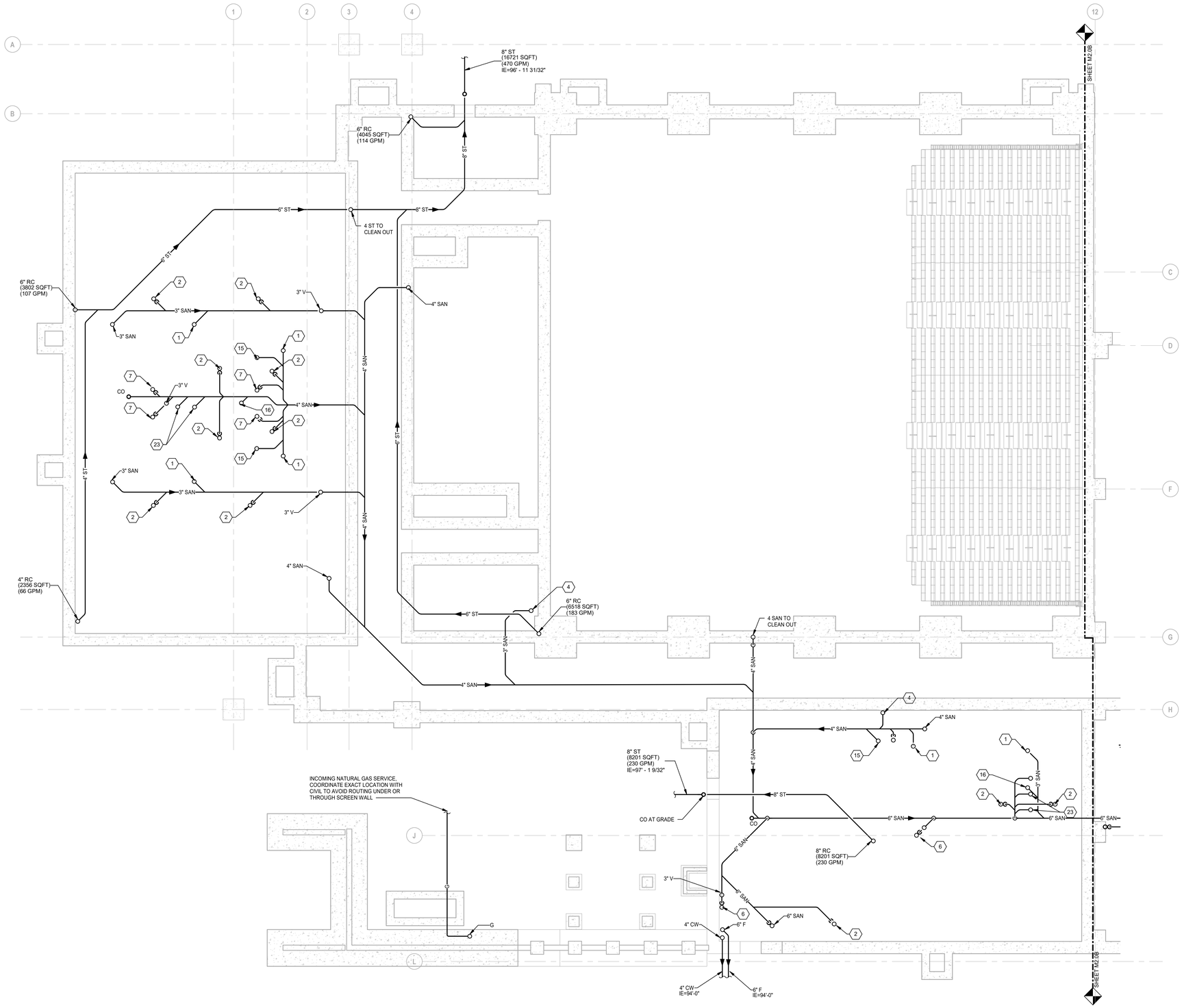

UNDERGROUND PLUMBING PLAN - ZONE 'A'

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

PLUMBING GENERAL NOTES:

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3 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.

7 HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.

8 PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.

9 PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.

10 MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

11 WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST <<<72">>>, OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1 3 SAN TO SINK/LAV.

2 3 SAN TO FD/FS.

3 ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.

4 3 SAN TO EWC.

5 3 SAN TO WASHING MACHINE OX BOX LOCATION.

6 3 SAN TO SS.

7 3 SAN TO SHOWER DRAIN.

8 ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.

9 ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.

10 2 SAN TO SINK/LAV.

11 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.

12 EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.

13 ROUTE GREASE SANITARY PIPING FROM THREE COMPARTMENT SINK TO GREASE INTERCEPTOR.

14 REFER TO NATURAL GAS DIAGRAM ON SHEET M6.4 FOR ROUTING AND SIZING SPECIFIC INFORMATION.

15 4 SAN FOR WC.

16 4 SAN FOR SANITARY CHASE.

17 ROUTE 1 1/2 IW FROM FSE PROVIDED FIXTURE AND TERMINATE TO CODE REQUIRED DISTANCE TO FLOOR SINK. COODINATE FINAL PIPING SIZES WITH FSE DRAWINGS PRIOR TO CONSTRUCTION.

18 ROUTE PIPING IN CHASE TO FIXTURES. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR SIZES TO FIXTURES.

19 ROUTE ADDITIONAL 3/4" CW LINE FOR CHEMICAL FEED SYSTM.

20 ROUTE 3/4 CW AND 3/4 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.

21 ROUTE 1/2 CW AND 1/2 HW DOWN IN COLUMN OR WALL SPACE. ROUTE 1/2 CW AND 1/2 HW TO SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.

22 ROUTE 1 CW AND 1 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.

23 3 SAN TO UR.

TMP ARCHITECTURE

TMP ARCHITECTURE INC

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www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

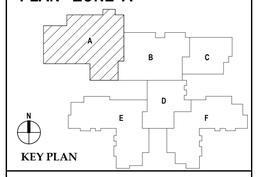
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE 'A'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

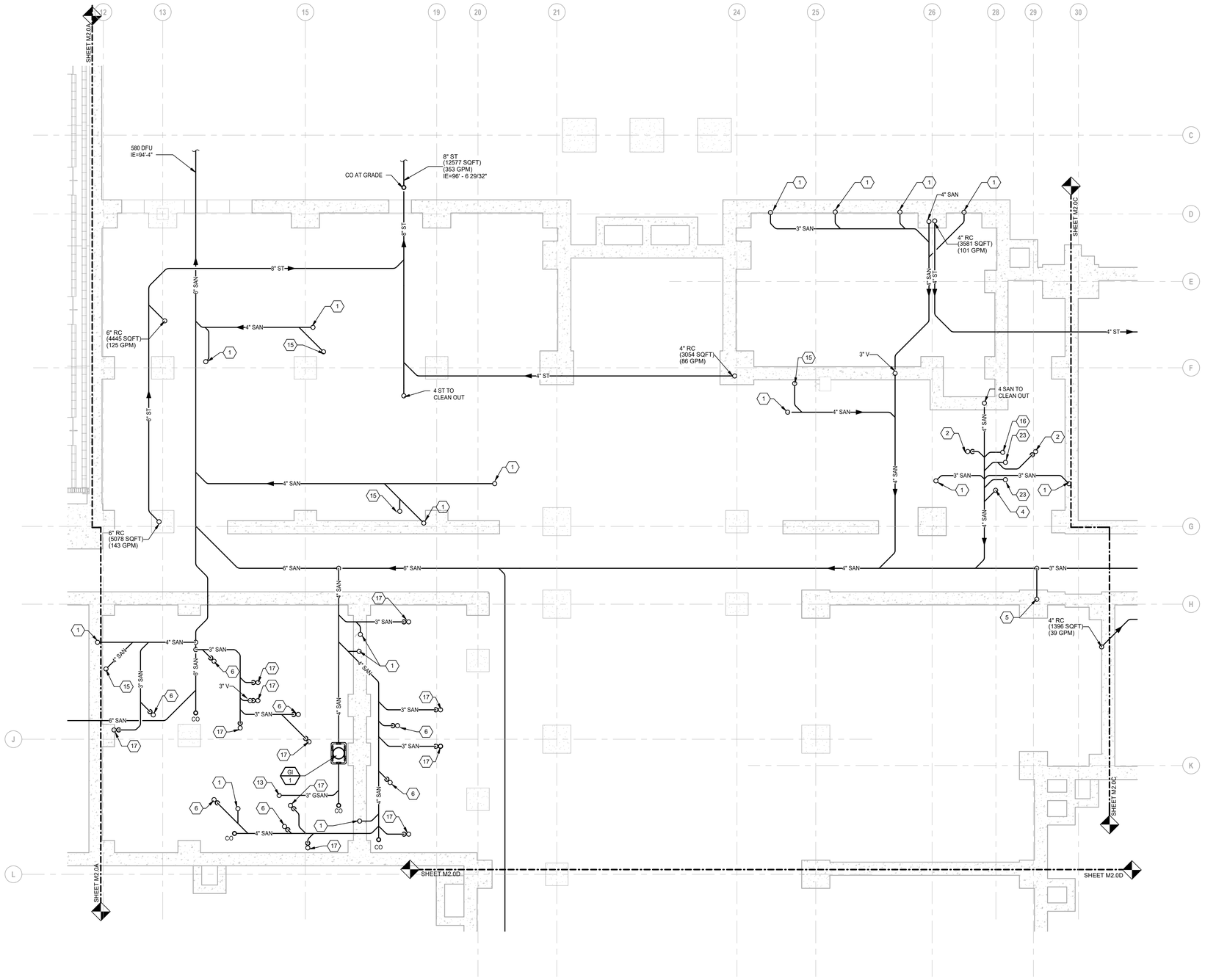
22102

DRAWING NO.

M2.0A

6/26/2024 10:09:24 AM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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



UNDERGROUND PLUMBING PLAN - ZONE 'B'

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

PLUMBING GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. 3 SAN TO SINK/LAV.
2. 3 SAN TO FD/FS.
3. ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.
4. 3 SAN TO EWC.
5. 3 SAN TO WASHING MACHINE OX BOX LOCATION.
6. 3 SAN TO SS.
7. 3 SAN TO SHOWER DRAIN.
8. ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.
9. ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.
10. 2 SAN TO SINK/LAV.
11. 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.
12. EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.
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14. REFER TO NATURAL GAS DIAGRAM ON SHEET M6.4 FOR ROUTING AND SIZING SPECIFIC INFORMATION.
15. 4 SAN FOR WC.
16. 4 SAN FOR SANITARY CHASE.
17. ROUTE 1 1/2 IW FROM FSE PROVIDED FIXTURE AND TERMINATE TO CODE REQUIRED DISTANCE TO FLOOR SINK. COODINATE FINAL PIPING SIZES WITH FSE DRAWINGS PRIOR TO CONSTRUCTION.
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23. 3 SAN TO UR.

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PBA Project No.: 2023.0154

PROJECT TITLE

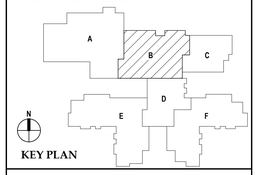
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE 'B'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

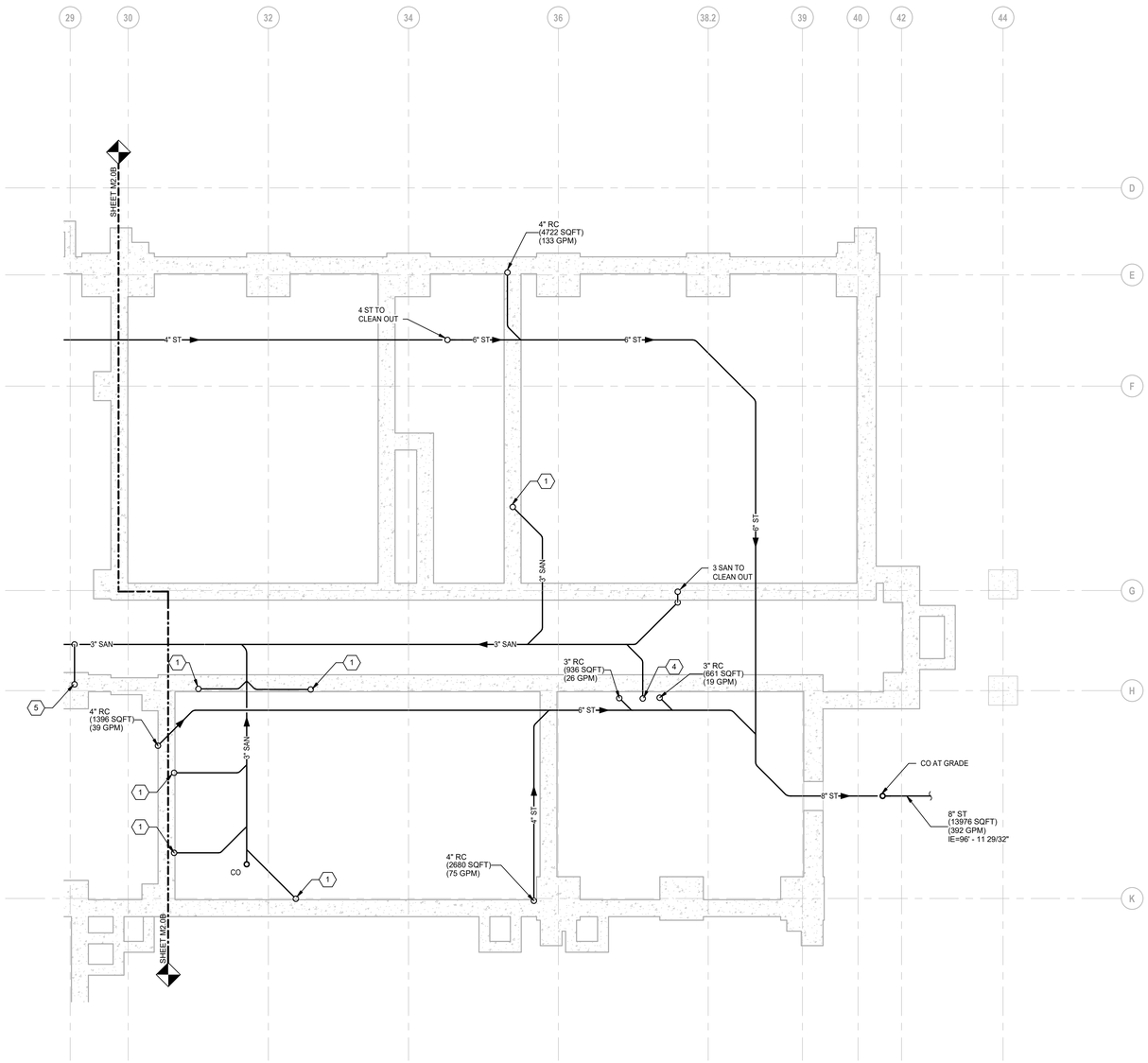
22102

DRAWING NO.

M2.0B

6/26/2024 10:09:28 AM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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



UNDERGROUND PLUMBING PLAN - ZONE 'C'

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

PLUMBING GENERAL NOTES:

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5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.

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8 PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.

9 PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.

10 MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

11 WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST <<<72">>>, OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1 3 SAN TO SINK/LAV.

2 3 SAN TO FD/FS.

3 ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.

4 3 SAN TO EWC.

5 3 SAN TO WASHING MACHINE OX BOX LOCATION.

6 3 SAN TO SS.

7 3 SAN TO SHOWER DRAIN.

8 ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.

9 ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.

10 2 SAN TO SINK/LAV.

11 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.

12 EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.

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23 3 SAN TO UR.

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PBA Project No.: 2023.0154

PROJECT TITLE

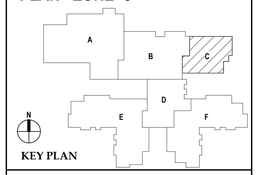
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE 'C'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M2.0C

6/26/2024 10:09:31 AM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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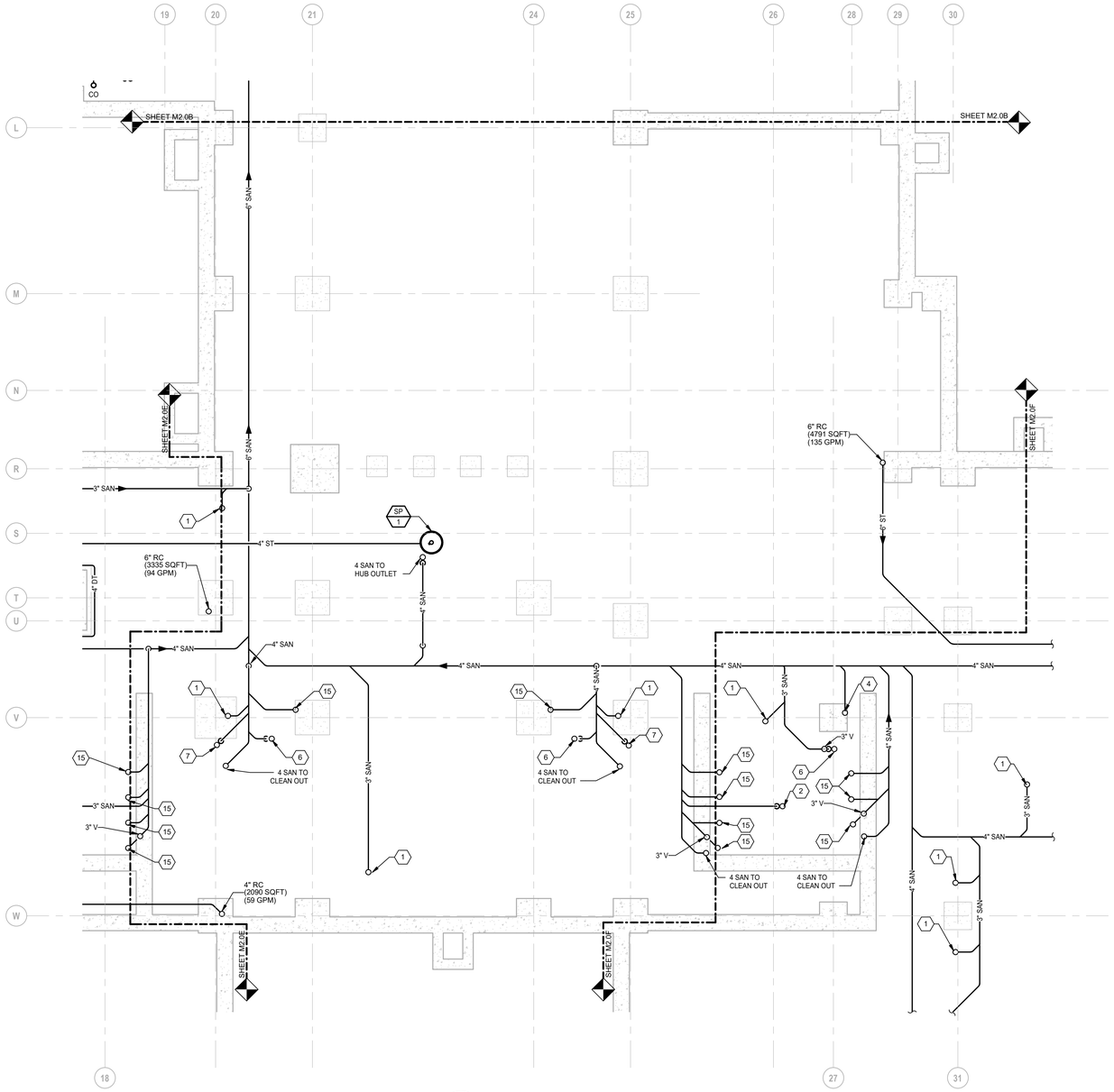
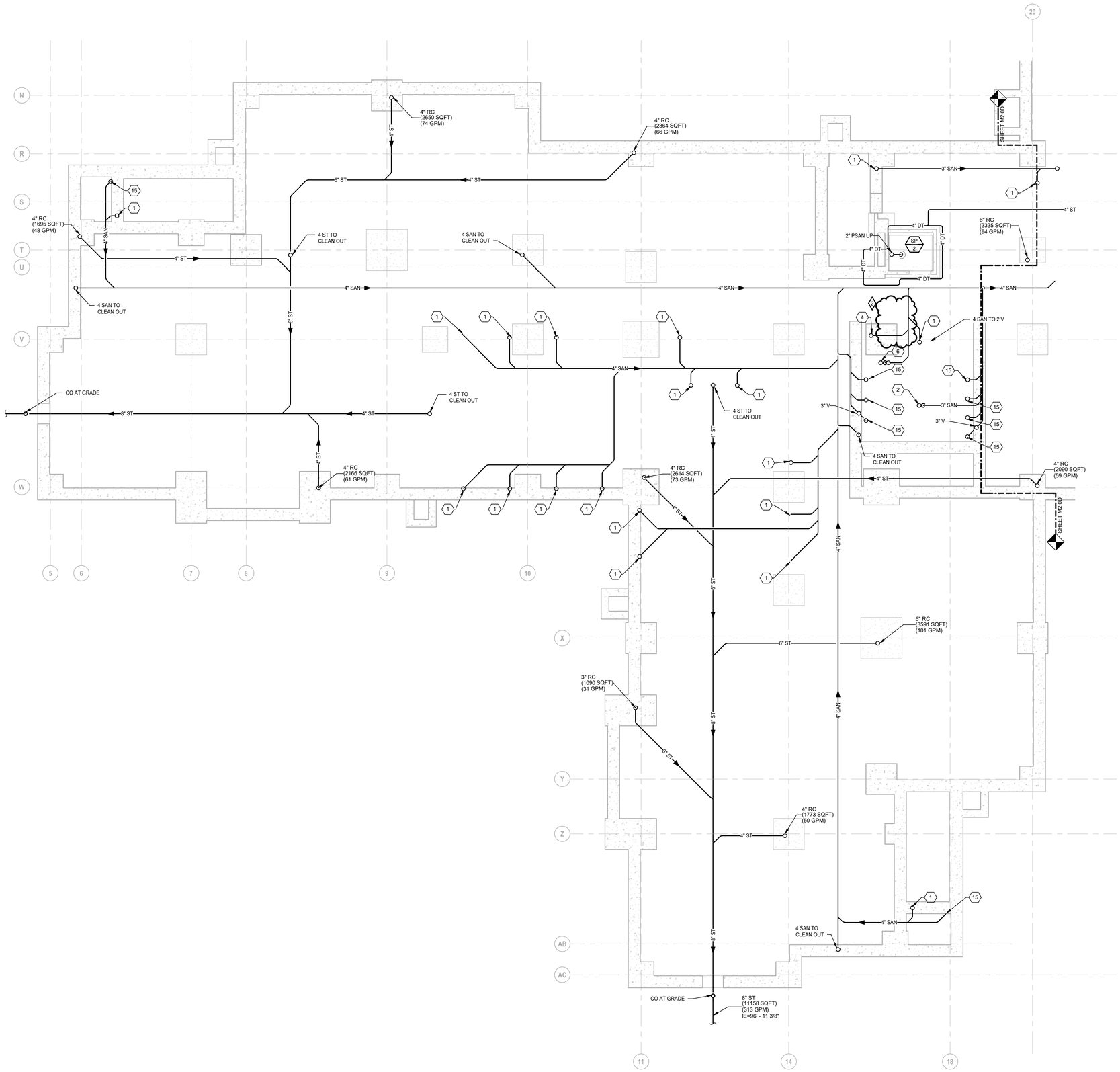

SHEET M2.0B
SHEET M2.0E
SHEET M2.0F
SHEET M2.0C
SHEET M2.0F
6" SAN
3" SAN
4" ST
6" ST
6" RC
(3335 SQFT)
(94 GPM)
4" D
SP
1
4 SAN TO
HUB OUTLET
4" SAN
4" SAN
4" SAN

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



UNDERGROUND PLUMBING PLAN - ZONE 'E'

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

PLUMBING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
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9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
11. WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST <<<72">>>, OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1. 3 SAN TO SINK/LAV.
2. 3 SAN TO FD/FS.
3. ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.
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5. 3 SAN TO WASHING MACHINE OX BOX LOCATION.
6. 3 SAN TO SS.
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8. ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.
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TMP ARCHITECTURE

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PROJECT TITLE

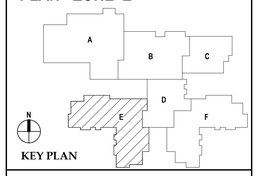
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE 'E'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M2.0E

7/11/2024 4:03:19 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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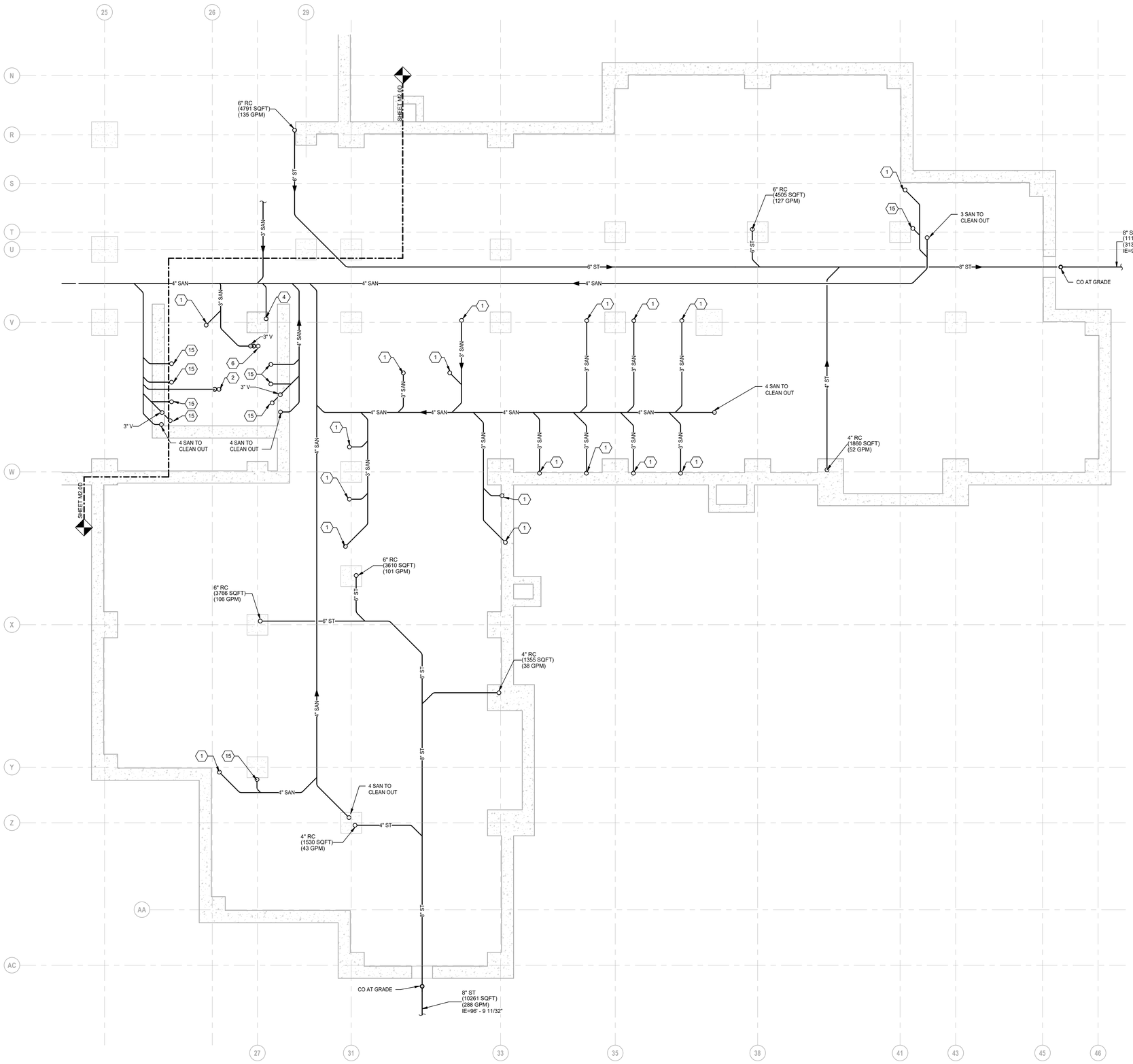

UNDERGROUND PLUMBING PLAN - ZONE 'F'

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

PLUMBING GENERAL NOTES:

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9 PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.

10 MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

11 WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST <<<72">>>, OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1 3 SAN TO SINK/LAV.

2 3 SAN TO FD/FS.

3 ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.

4 3 SAN TO EWC.

5 3 SAN TO WASHING MACHINE OX BOX LOCATION.

6 3 SAN TO SS.

7 3 SAN TO SHOWER DRAIN.

8 ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.

9 ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.

10 2 SAN TO SINK/LAV.

11 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.

12 EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.

13 ROUTE GREASE SANITARY PIPING FROM THREE COMPARTMENT SINK TO GREASE INTERCEPTOR.

14 REFER TO NATURAL GAS DIAGRAM ON SHEET M6.4 FOR ROUTING AND SIZING SPECIFIC INFORMATION.

15 4 SAN FOR WC.

16 4 SAN FOR SANITARY CHASE.

17 ROUTE 1 1/2 IW FROM FSE PROVIDED FIXTURE AND TERMINATE TO CODE REQUIRED DISTANCE TO FLOOR SINK. COODINATE FINAL PIPING SIZES WITH FSE DRAWINGS PRIOR TO CONSTRUCTION.

18 ROUTE PIPING IN CHASE TO FIXTURES. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR SIZES TO FIXTURES.

19 ROUTE ADDITIONAL 3/4" CW LINE FOR CHEMICAL FEED SYSTM.

20 ROUTE 3/4 CW AND 3/4 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.

21 ROUTE 1/2 CW AND 1/2 HW DOWN IN COLUMN OR WALL SPACE. ROUTE 1/2 CW AND 1/2 HW TO SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.

22 ROUTE 1 CW AND 1 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.

23 3 SAN TO UR.

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

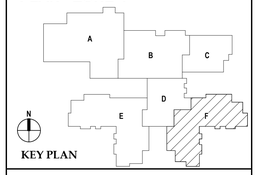
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

UNDERGROUND PLUMBING PLAN - ZONE 'F'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M2.0F

6/17/2024 1:44:32 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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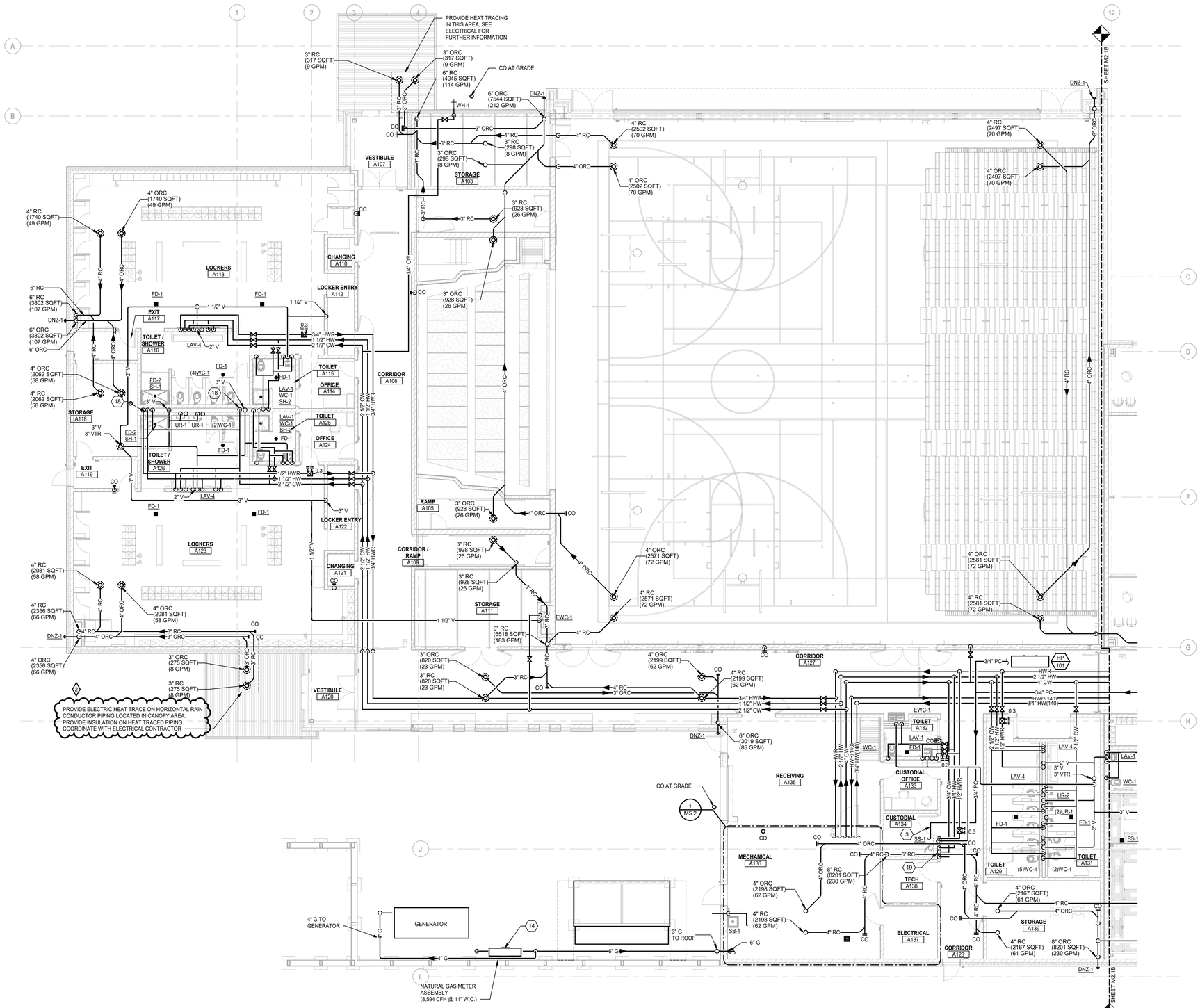

FIRST LEVEL PLUMBING PLAN - ZONE 'A'

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

PLUMBING GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. 3 SAN TO SINK/LAV.
2. 3 SAN TO FD/FS.
3. ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.
4. 3 SAN TO EWC.
5. 3 SAN TO WASHING MACHINE OX BOX LOCATION.
6. 3 SAN TO SS.
7. 3 SAN TO SHOWER DRAIN.
8. ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.
9. ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.
10. 2 SAN TO SINK/LAV.
11. 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.
12. EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.
13. ROUTE GREASE SANITARY PIPING FROM THREE COMPARTMENT SINK TO GREASE INTERCEPTOR.
14. REFER TO NATURAL GAS DIAGRAM ON SHEET M6.4 FOR ROUTING AND SIZING SPECIFIC INFORMATION.
15. 4 SAN FOR WC.
16. 4 SAN FOR SANITARY CHASE.
17. ROUTE 1 1/2 IW FROM FSE PROVIDED FIXTURE AND TERMINATE TO CODE REQUIRED DISTANCE TO FLOOR SINK. COODINATE FINAL PIPING SIZES WITH FSE DRAWINGS PRIOR TO CONSTRUCTION.
18. ROUTE PIPING IN CHASE TO FIXTURES. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR SIZES TO FIXTURES.
19. ROUTE ADDITIONAL 3/4" CW LINE FOR CHEMICAL FEED SYSTM.
20. ROUTE 3/4 CW AND 3/4 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
21. ROUTE 1/2 CW AND 1/2 HW DOWN IN COLUMN OR WALL SPACE. ROUTE 1/2 CW AND 1/2 HW TO SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
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23. 3 SAN TO UR.

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PBA Project No.: 2023.0154

PROJECT TITLE

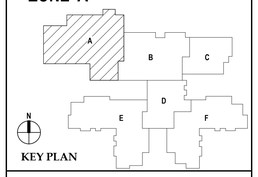
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL PLUMBING PLAN - ZONE 'A'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M2.1A

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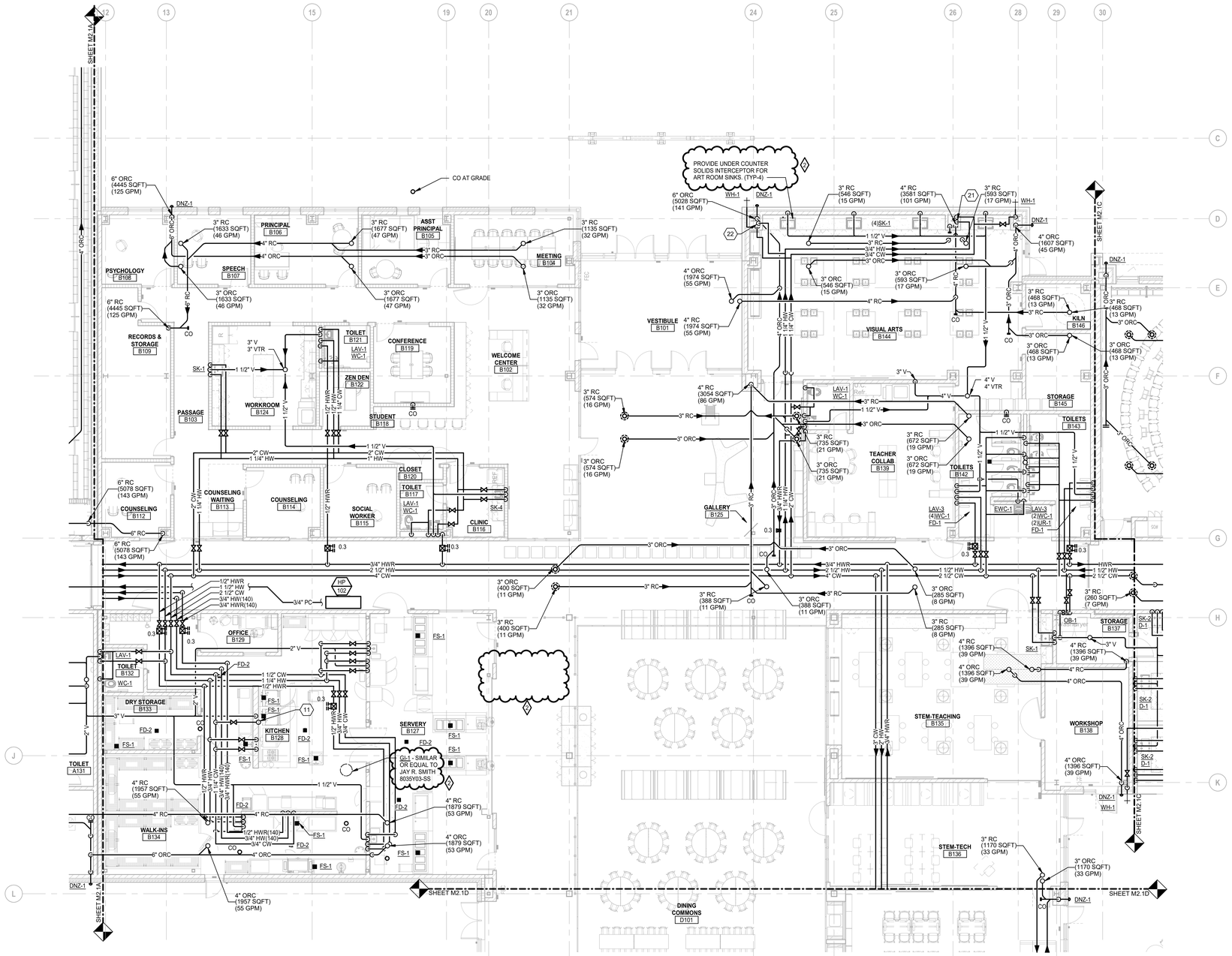

FIRST LEVEL PLUMBING PLAN - ZONE 'B'

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

PLUMBING GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. 3 SAN TO SINK/LAV.
2. 3 SAN TO FD/FS.
3. ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.
4. 3 SAN TO EWC.
5. 3 SAN TO WASHING MACHINE OX BOX LOCATION.
6. 3 SAN TO SS.
7. 3 SAN TO SHOWER DRAIN.
8. ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.
9. ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.
10. 2 SAN TO SINK/LAV.
11. 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.
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15. 4 SAN FOR WC.
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23. 3 SAN TO UR.

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PBA Project No.: 2023.0154

PROJECT TITLE

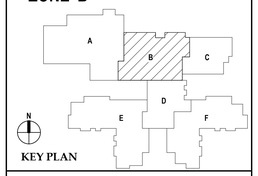
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL PLUMBING PLAN - ZONE 'B'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M2.1B

7/11/2024 4:03:44 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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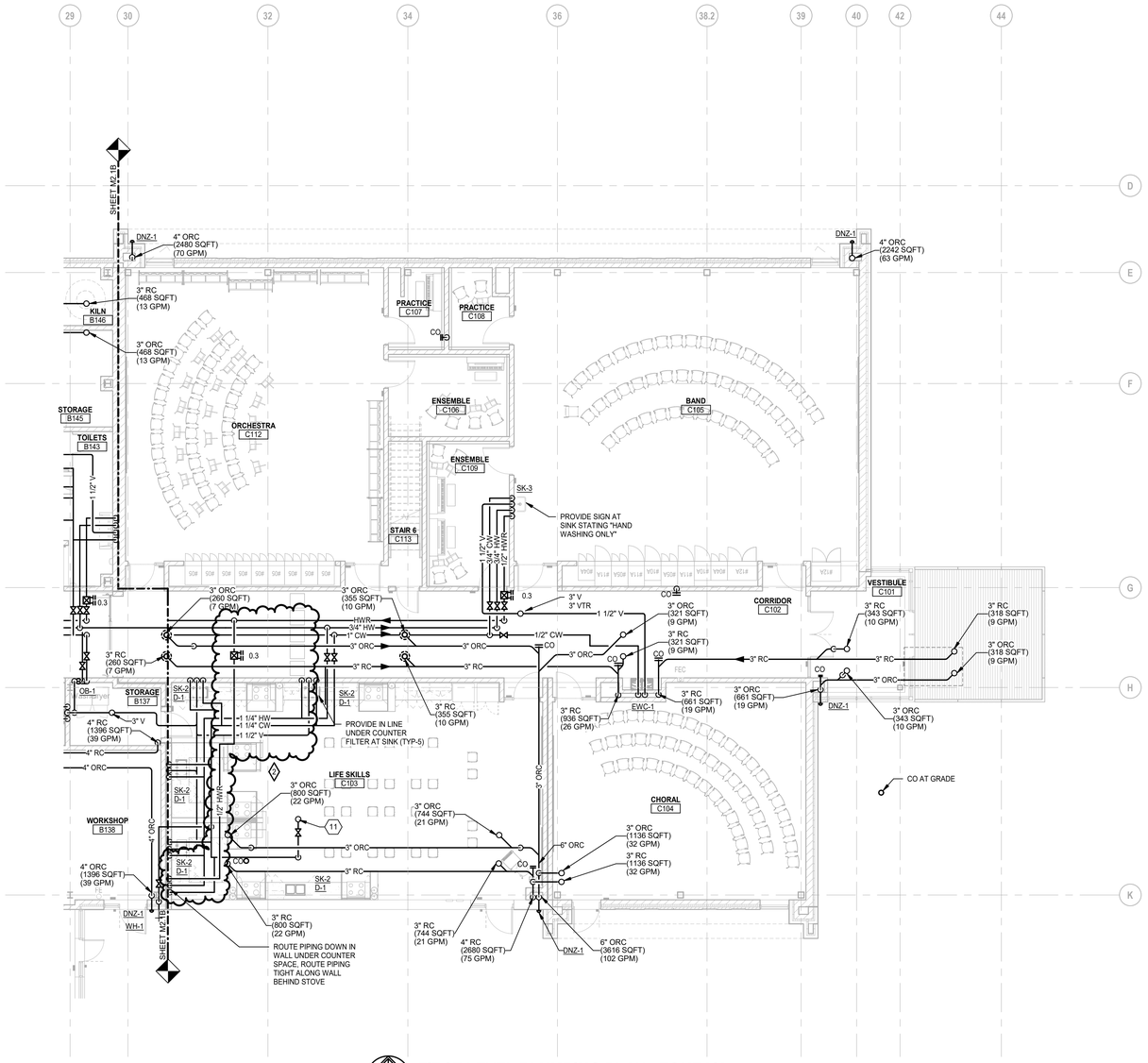

FIRST LEVEL PLUMBING PLAN - ZONE 'C'

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

PLUMBING GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

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2. 3 SAN TO FD/FS.
3. ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.
4. 3 SAN TO EWC.
5. 3 SAN TO WASHING MACHINE OX BOX LOCATION.
6. 3 SAN TO SS.
7. 3 SAN TO SHOWER DRAIN.
8. ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.
9. ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.
10. 2 SAN TO SINK/LAV.
11. 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.
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15. 4 SAN FOR WC.
16. 4 SAN FOR SANITARY CHASE.
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23. 3 SAN TO UR.

TMP ARCHITECTURE

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PROJECT TITLE

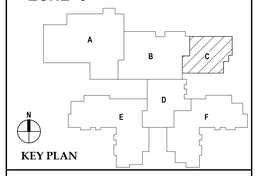
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL PLUMBING PLAN - ZONE 'C'



KEY PLAN

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DATE:	ISSUED FOR:
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06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

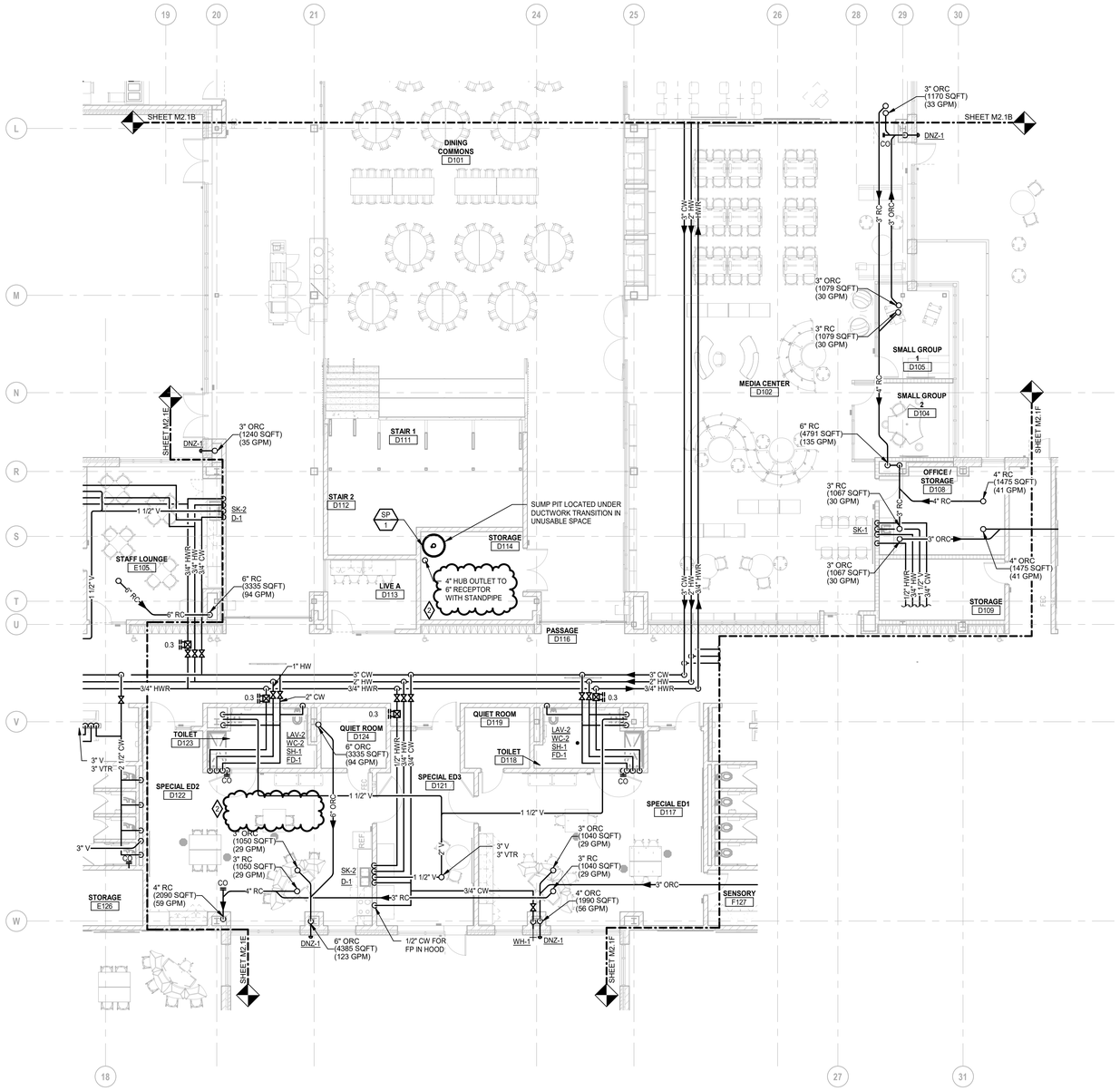
22102

DRAWING NO.

M2.1C

7/11/2024 4:04:04 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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



FIRST LEVEL PLUMBING PLAN - ZONE 'D'

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

PLUMBING GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

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 AT LEAST <<<72">>>, OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1 3 SAN TO SINK/LAV.

2 3 SAN TO FD/FS.

3 ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.

4 3 SAN TO EWC.

5 3 SAN TO WASHING MACHINE OX BOX LOCATION.

6 3 SAN TO SS.

7 3 SAN TO SHOWER DRAIN.

8 ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.

9 ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.

10 2 SAN TO SINK/LAV.

11 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.

12 EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.

13 ROUTE GREASE SANITARY PIPING FROM THREE COMPARTMENT SINK TO GREASE INTERCEPTOR.

14 REFER TO NATURAL GAS DIAGRAM ON SHEET M6.4 FOR ROUTING AND SIZING SPECIFIC INFORMATION.

15 4 SAN FOR WC.

16 4 SAN FOR SANITARY CHASE.

17 ROUTE 1 1/2 IW FROM FSE PROVIDED FIXTURE AND TERMINATE TO CODE REQUIRED DISTANCE TO FLOOR SINK. COODINATE FINAL PIPING SIZES WITH FSE DRAWINGS PRIOR TO CONSTRUCTION.

18 ROUTE PIPING IN CHASE TO FIXTURES. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR SIZES TO FIXTURES.

19 ROUTE ADDITIONAL 3/4" CW LINE FOR CHEMICAL FEED SYSTM.

20 ROUTE 3/4 CW AND 3/4 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.

21 ROUTE 1/2 CW AND 1/2 HW DOWN IN COLUMN OR WALL SPACE. ROUTE 1/2 CW AND 1/2 HW TO SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.

22 ROUTE 1 CW AND 1 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.

23 3 SAN TO UR.

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PBA Project No.: 2023.0154

PROJECT TITLE

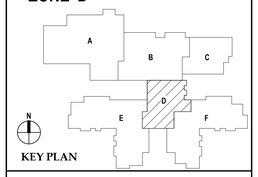
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL PLUMBING PLAN - ZONE 'D'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M2.1D

7/11/2024 4:04:12 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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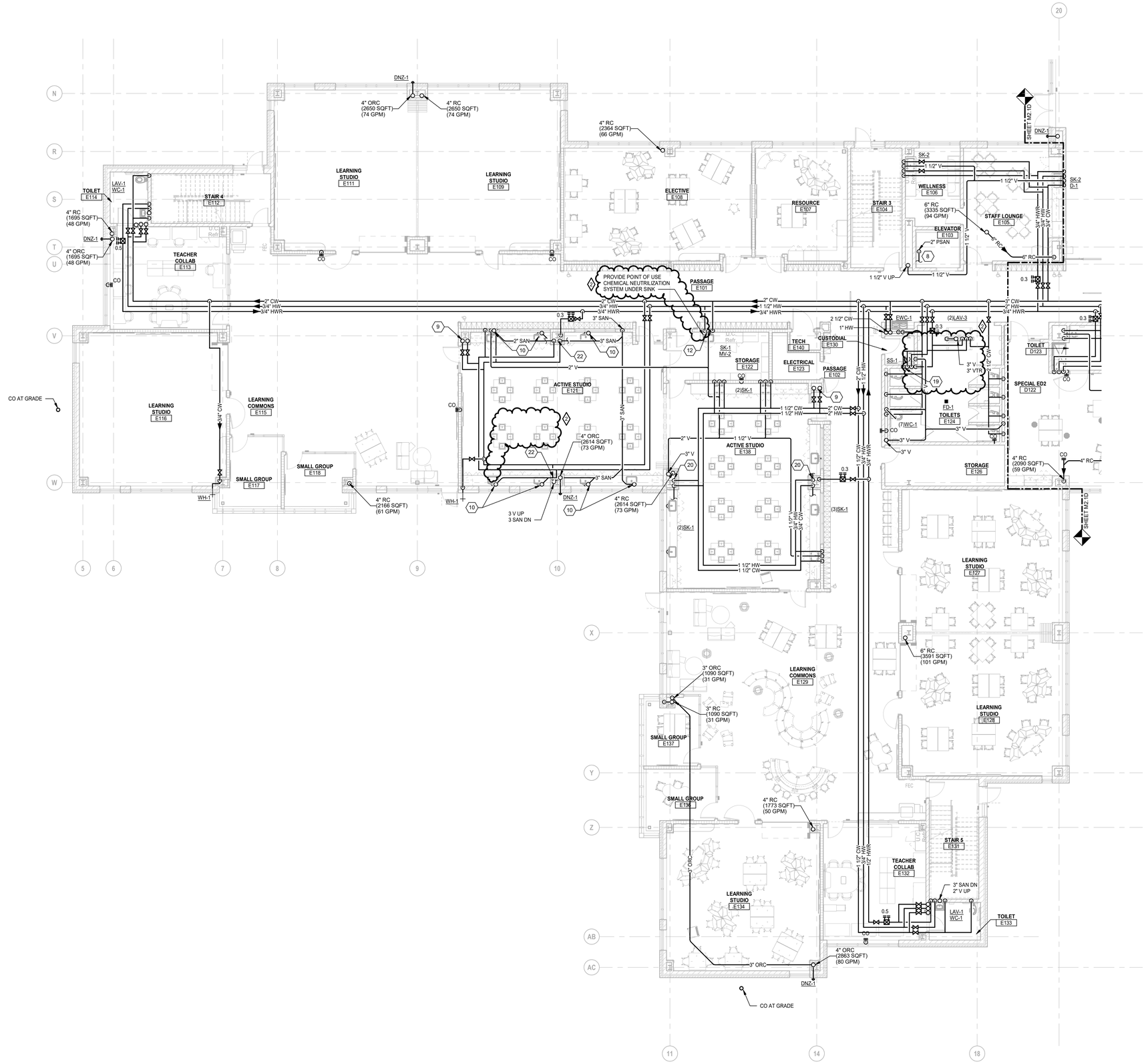

FIRST LEVEL PLUMBING PLAN - ZONE 'E'

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

PLUMBING GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. 3 SAN TO SINK/LAV.
2. 3 SAN TO FD/FS.
3. ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.
4. 3 SAN TO EWC.
5. 3 SAN TO WASHING MACHINE OX BOX LOCATION.
6. 3 SAN TO SS.
7. 3 SAN TO SHOWER DRAIN.
8. ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.
9. ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.
10. 2 SAN TO SINK/LAV.
11. 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.
12. EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.
13. ROUTE GREASE SANITARY PIPING FROM THREE COMPARTMENT SINK TO GREASE INTERCEPTOR.
14. REFER TO NATURAL GAS DIAGRAM ON SHEET M6.4 FOR ROUTING AND SIZING SPECIFIC INFORMATION.
15. 4 SAN FOR WC.
16. 4 SAN FOR SANITARY CHASE.
17. ROUTE 1 1/2 IW FROM FSE PROVIDED FIXTURE AND TERMINATE TO CODE REQUIRED DISTANCE TO FLOOR SINK. COODINATE FINAL PIPING SIZES WITH FSE DRAWINGS PRIOR TO CONSTRUCTION.
18. ROUTE PIPING IN CHASE TO FIXTURES. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR SIZES TO FIXTURES.
19. ROUTE ADDITIONAL 3/4" CW LINE FOR CHEMICAL FEED SYSTM.
20. ROUTE 3/4 CW AND 3/4 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
21. ROUTE 1/2 CW AND 1/2 HW DOWN IN COLUMN OR WALL SPACE. ROUTE 1/2 CW AND 1/2 HW TO SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
22. ROUTE 1 CW AND 1 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
23. 3 SAN TO UR.

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PBA Project No.: 2023.0154

PROJECT TITLE

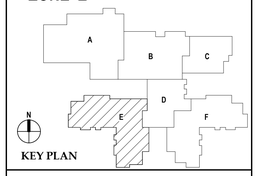
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL PLUMBING PLAN - ZONE 'E'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
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06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M2.1E

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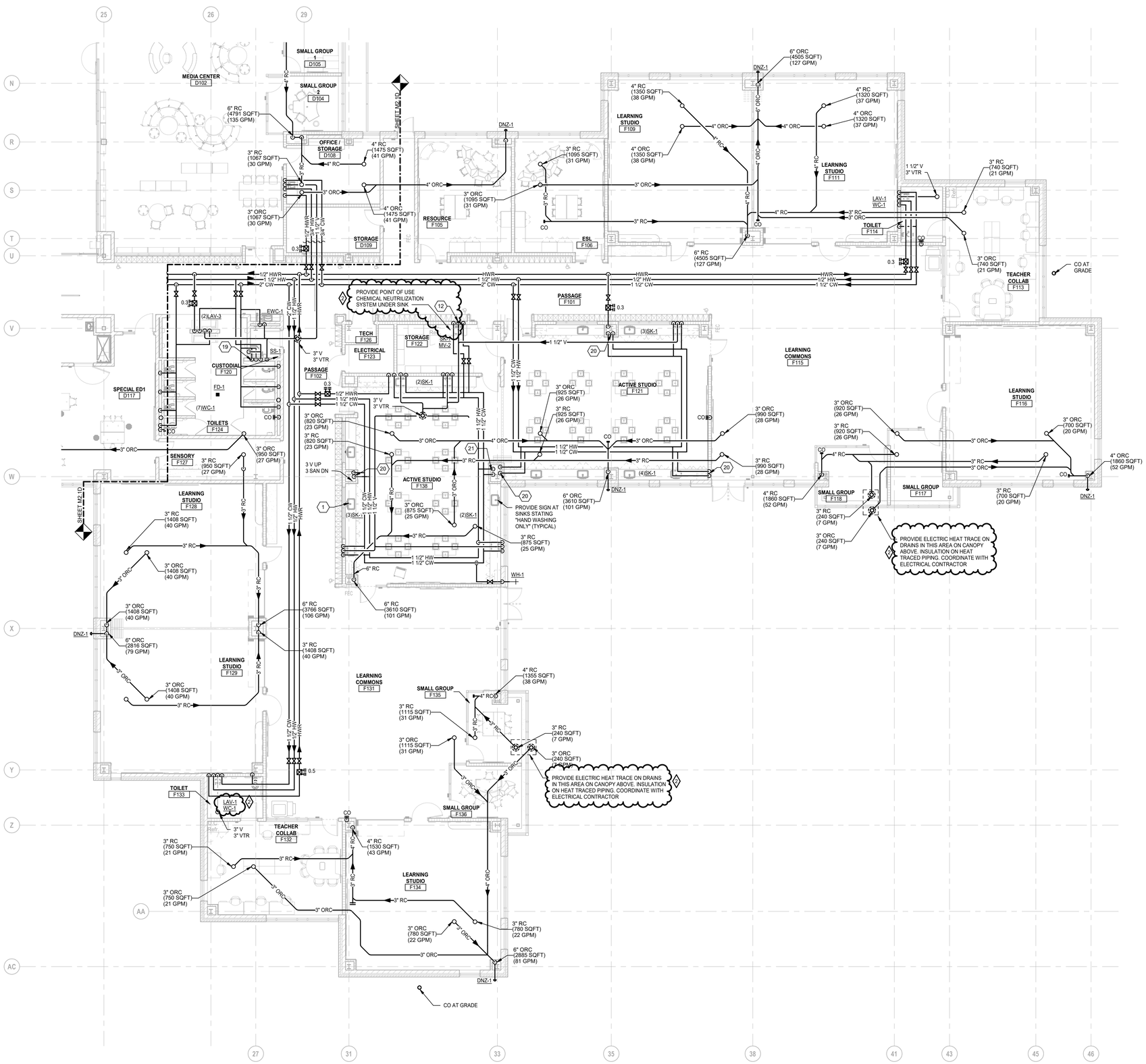

FIRST LEVEL PLUMBING PLAN - ZONE 'F'

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

PLUMBING GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. 3 SAN TO SINK/LAV.
2. 3 SAN TO FD/FS.
3. ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.
4. 3 SAN TO EWC.
5. 3 SAN TO WASHING MACHINE OX BOX LOCATION.
6. 3 SAN TO SS.
7. 3 SAN TO SHOWER DRAIN.
8. ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.
9. ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.
10. 2 SAN TO SINK/LAV.
11. 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.
12. EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.
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15. 4 SAN FOR WC.
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17. ROUTE 1 1/2 IW FROM FSE PROVIDED FIXTURE AND TERMINATE TO CODE REQUIRED DISTANCE TO FLOOR SINK. COODINATE FINAL PIPING SIZES WITH FSE DRAWINGS PRIOR TO CONSTRUCTION.
18. ROUTE PIPING IN CHASE TO FIXTURES. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR SIZES TO FIXTURES.
19. ROUTE ADDITIONAL 3/4" CW LINE FOR CHEMICAL FEED SYSTM.
20. ROUTE 3/4 CW AND 3/4 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
21. ROUTE 1/2 CW AND 1/2 HW DOWN IN COLUMN OR WALL SPACE. ROUTE 1/2 CW AND 1/2 HW TO SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
22. ROUTE 1 CW AND 1 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
23. 3 SAN TO UR.

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PBA Project No.: 2023.0154

PROJECT TITLE

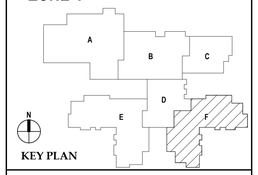
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL PLUMBING PLAN - ZONE 'F'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M2.1F

7/11/2024 4:04:36 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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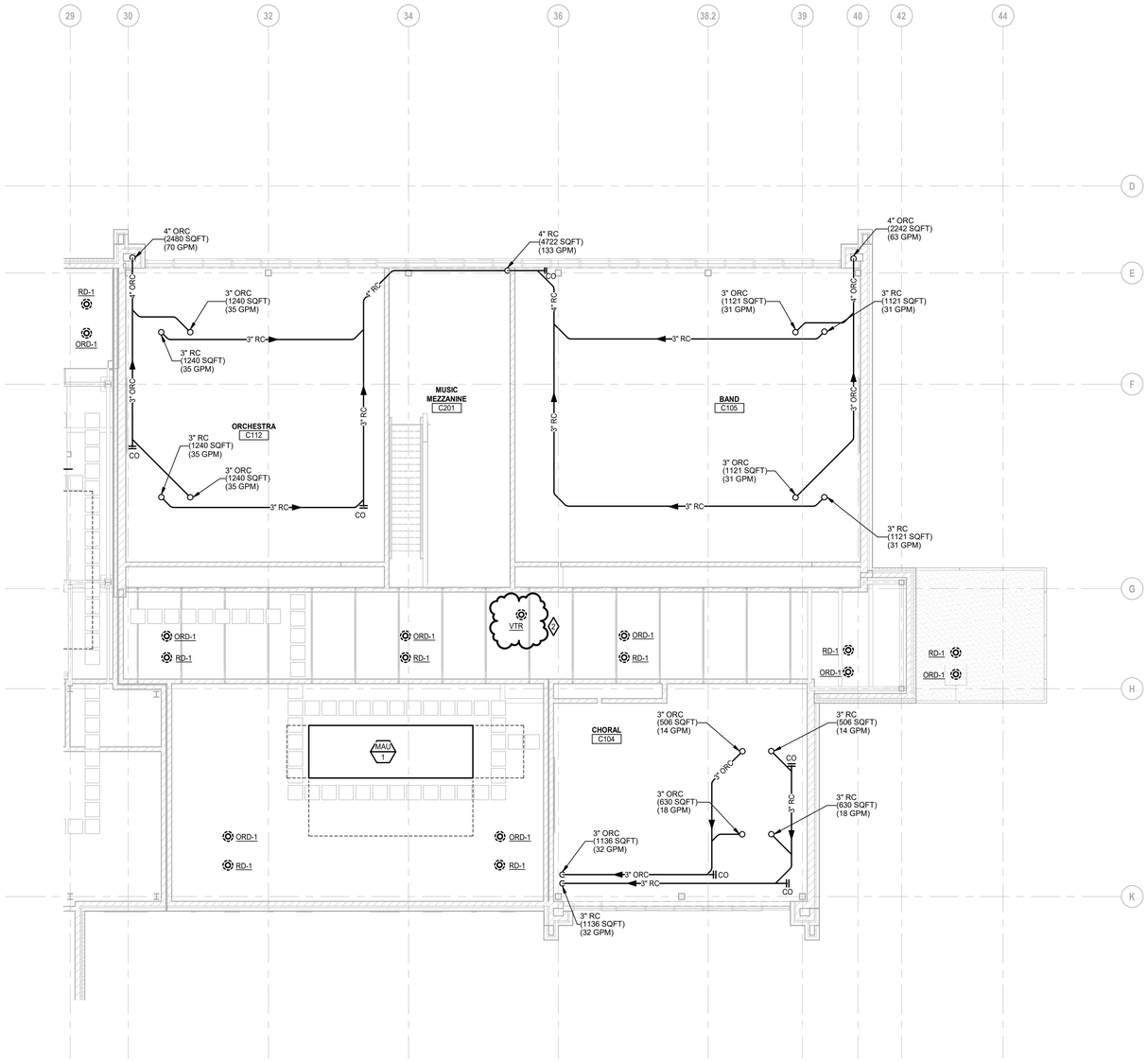

MEZZANINE LEVEL PLUMBING PLAN - ZONE 'C'

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

PLUMBING GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.

7 HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.

8 PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.

9 PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.

10 MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

11 WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST <<<72">>>, OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1 3 SAN TO SINK/LAV.

2 3 SAN TO FD/FS.

3 ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.

4 3 SAN TO EWC.

5 3 SAN TO WASHING MACHINE OX BOX LOCATION.

6 3 SAN TO SS.

7 3 SAN TO SHOWER DRAIN.

8 ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.

9 ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.

10 2 SAN TO SINK/LAV.

11 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.

12 EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.

13 ROUTE GREASE SANITARY PIPING FROM THREE COMPARTMENT SINK TO GREASE INTERCEPTOR.

14 REFER TO NATURAL GAS DIAGRAM ON SHEET M6.4 FOR ROUTING AND SIZING SPECIFIC INFORMATION.

15 4 SAN FOR WC.

16 4 SAN FOR SANITARY CHASE.

17 ROUTE 1 1/2 IW FROM FSE PROVIDED FIXTURE AND TERMINATE TO CODE REQUIRED DISTANCE TO FLOOR SINK. COODINATE FINAL PIPING SIZES WITH FSE DRAWINGS PRIOR TO CONSTRUCTION.

18 ROUTE PIPING IN CHASE TO FIXTURES. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR SIZES TO FIXTURES.

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22 ROUTE 1 CW AND 1 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.

23 3 SAN TO UR.

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PROJECT TITLE

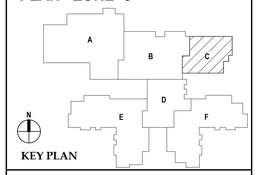
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

MEZZANINE LEVEL PLUMBING PLAN - ZONE 'C'



KEY PLAN

ISSUE DATES

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DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M2.2C

7/11/2024 4:04:39 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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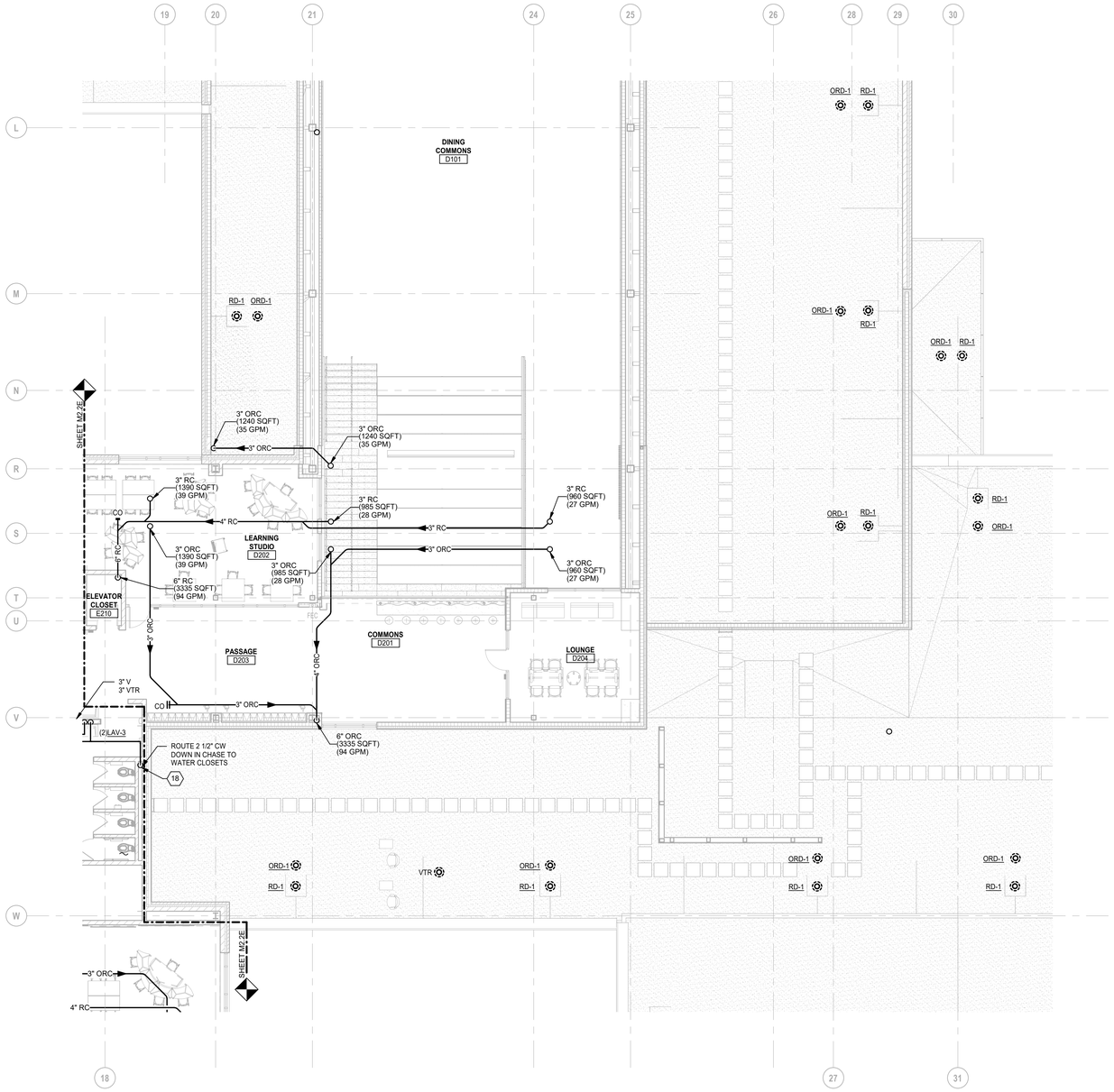

SECOND LEVEL PLUMBING PLAN - ZONE 'D'

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

PLUMBING GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. 3 SAN TO SINK/LAV.
2. 3 SAN TO FD/FS.
3. ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.
4. 3 SAN TO EWC.
5. 3 SAN TO WASHING MACHINE OX BOX LOCATION.
6. 3 SAN TO SS.
7. 3 SAN TO SHOWER DRAIN.
8. ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.
9. ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.
10. 2 SAN TO SINK/LAV.
11. 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.
12. EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.
13. ROUTE GREASE SANITARY PIPING FROM THREE COMPARTMENT SINK TO GREASE INTERCEPTOR.
14. REFER TO NATURAL GAS DIAGRAM ON SHEET M6.4 FOR ROUTING AND SIZING SPECIFIC INFORMATION.
15. 4 SAN FOR WC.
16. 4 SAN FOR SANITARY CHASE.
17. ROUTE 1 1/2 IW FROM FSE PROVIDED FIXTURE AND TERMINATE TO CODE REQUIRED DISTANCE TO FLOOR SINK. COODINATE FINAL PIPING SIZES WITH FSE DRAWINGS PRIOR TO CONSTRUCTION.
18. ROUTE PIPING IN CHASE TO FIXTURES. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR SIZES TO FIXTURES.
19. ROUTE ADDITIONAL 3/4" CW LINE FOR CHEMICAL FEED SYSTM.
20. ROUTE 3/4 CW AND 3/4 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
21. ROUTE 1/2 CW AND 1/2 HW DOWN IN COLUMN OR WALL SPACE. ROUTE 1/2 CW AND 1/2 HW TO SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
22. ROUTE 1 CW AND 1 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
23. 3 SAN TO UR.

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

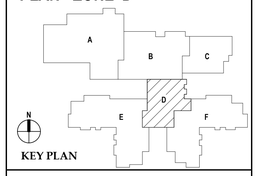
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL PLUMBING PLAN - ZONE 'D'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

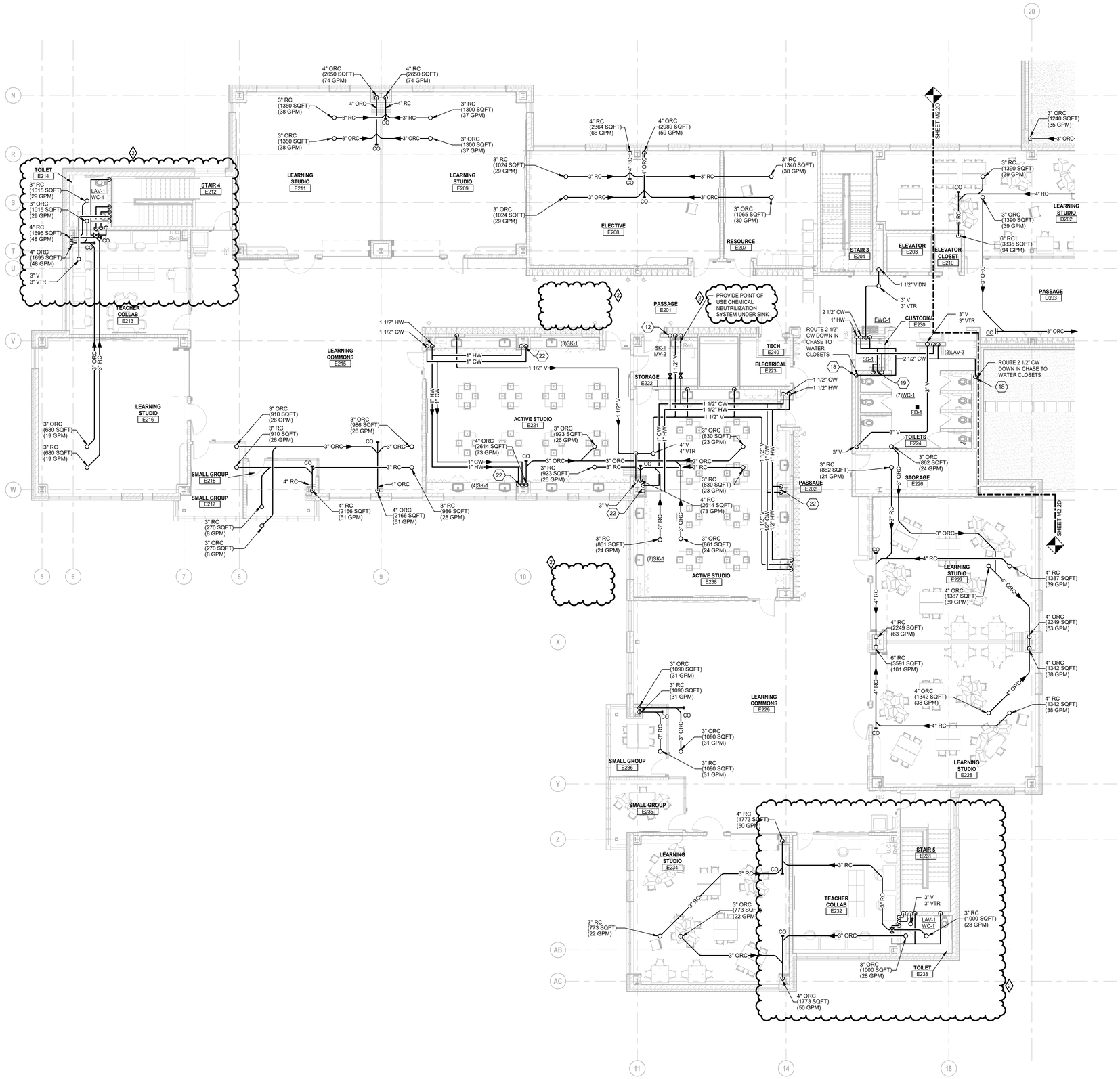
22102

DRAWING NO.

M2.2D

6/26/2024 10:11:18 AM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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



SECOND LEVEL PLUMBING PLAN - ZONE 'E'

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

PLUMBING GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. 3 SAN TO SINK/LAV.
2. 3 SAN TO FD/FS.
3. ROUTE 3/4 PUMPED CONDENSATE FROM HP-101 AND HP-102 TO CUSTODIAL A134 AND SPILL INTO SERVICE SINK.
4. 3 SAN TO EWC.
5. 3 SAN TO WASHING MACHINE OX BOX LOCATION.
6. 3 SAN TO SS.
7. 3 SAN TO SHOWER DRAIN.
8. ROUTE PSAN FROM SP-2 TO HUB OUTLET LOCATED IN CUSTODIAL E130.
9. ROUTE 1 1/2 CW & 1 1/2 HW UP TO SECOND FLOOR SINKS IN COLUMN SPACE PROVIDED.
10. 2 SAN TO SINK/LAV.
11. 3/4 CW TO ROOF MOUNTED HYDRANT. ROUTE IW TO CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK.
12. EXTEND CW & HW TO MV-1 LOCATED UNDER SINK TO PROVIDE TEMPERED WATER TO EMERGENCY EYE WASH.
13. ROUTE GREASE SANITARY PIPING FROM THREE COMPARTMENT SINK TO GREASE INTERCEPTOR.
14. REFER TO NATURAL GAS DIAGRAM ON SHEET M6.4 FOR ROUTING AND SIZING SPECIFIC INFORMATION.
15. 4 SAN FOR WC.
16. 4 SAN FOR SANITARY CHASE.
17. ROUTE 1 1/2 IW FROM FSE PROVIDED FIXTURE AND TERMINATE TO CODE REQUIRED DISTANCE TO FLOOR SINK. COODINATE FINAL PIPING SIZES WITH FSE DRAWINGS PRIOR TO CONSTRUCTION.
18. ROUTE PIPING IN CHASE TO FIXTURES. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR SIZES TO FIXTURES.
19. ROUTE ADDITIONAL 3/4" CW LINE FOR CHEMICAL FEED SYSTM.
20. ROUTE 3/4 CW AND 3/4 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
21. ROUTE 1/2 CW AND 1/2 HW DOWN IN COLUMN OR WALL SPACE. ROUTE 1/2 CW AND 1/2 HW TO SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
22. ROUTE 1 CW AND 1 HW DOWN IN COLUMN. ROUTE 1/2 CW AND 1/2 HW TO EACH SINK. PIPING UNDER COUNTER SPACE TO CABINET MOUNTED SINK.
23. 3 SAN TO UR.

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PBA Project No.: 2023.0154

PROJECT TITLE

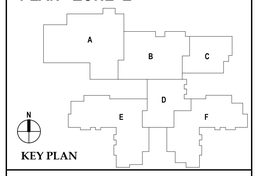
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL PLUMBING PLAN - ZONE 'E'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	MEP
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

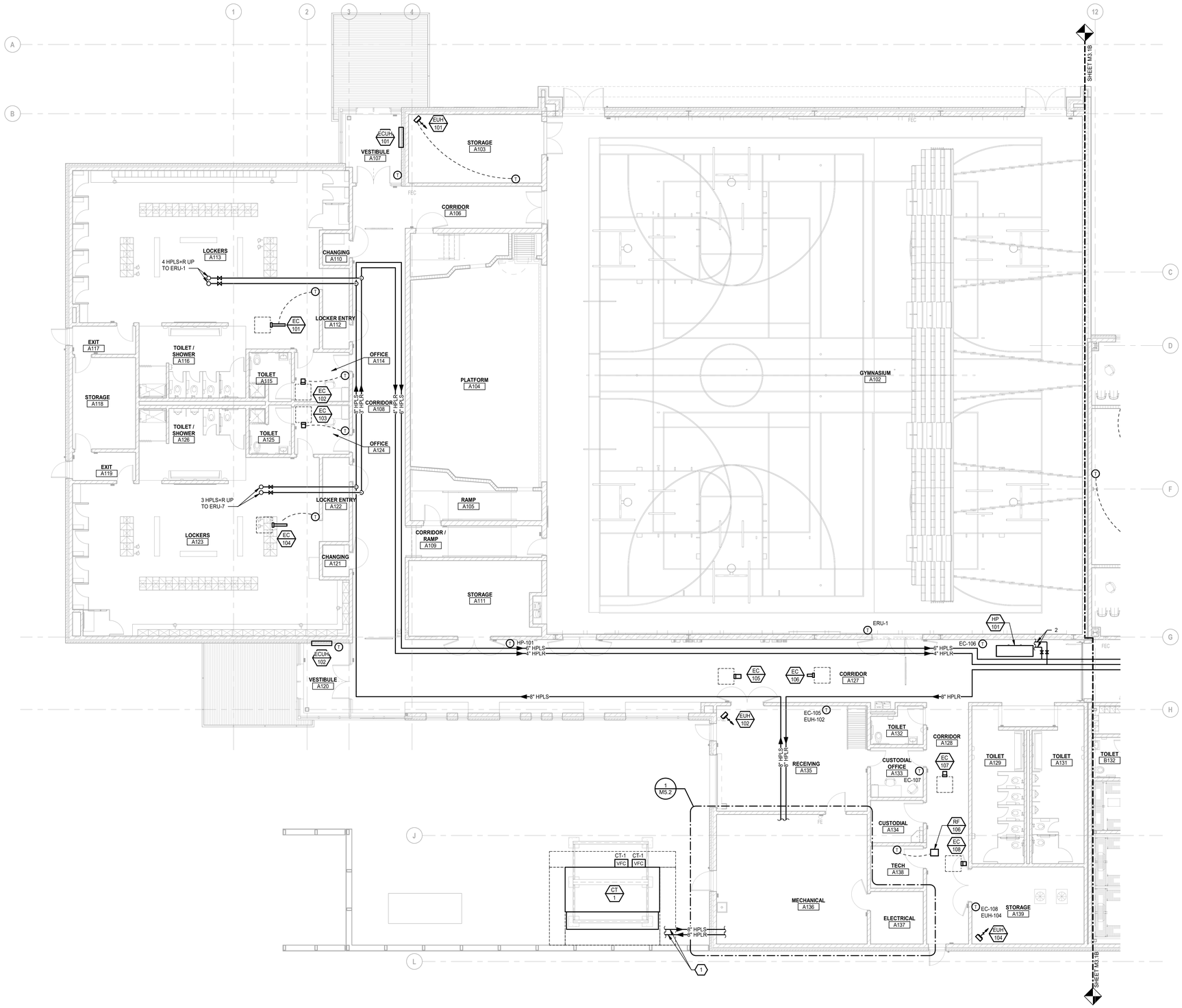
22102

DRAWING NO.

M2.2E

7/11/2024 4:04:54 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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



FIRST LEVEL HVAC PIPING PLAN - ZONE 'A'

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

HVAC PIPING GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

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 SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.

7 COORDINATE LOCATION OF DUCT-MOUNTED HYDRONIC DEVICES WITH SHEET METAL TRADES.

8 BRANCH PIPING SERVING TERMINAL UNIT HEATING COILS OR RADIANT CEILING PANELS SHALL BE 3/4" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING MORE THAN ONE TERMINAL UNIT HEATING COIL SHALL BE 1" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING HOT WATER UNIT HEATERS AND CABINET UNIT HEATERS SHALL BE 1" UNLESS OTHERWISE NOTED.

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

CONSTRUCTION KEY NOTES:

1 REFER TO M6.5 FOR HEAT PUMP LOOP SYSTEM PIPING DIAGRAM.

2 4 HPL SYSTEM FLOW BYPASS (150 GPM).

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

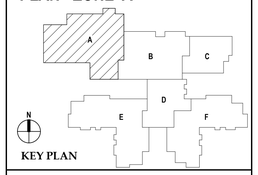
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL HVAC PIPING PLAN - ZONE 'A'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	WTF
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M3.1A

6/26/2024 9:23:44 AM Autodesk Docs://22102_Troy Smith MS/0023-0154_TSD Smith MS_MEP_r22.rvt

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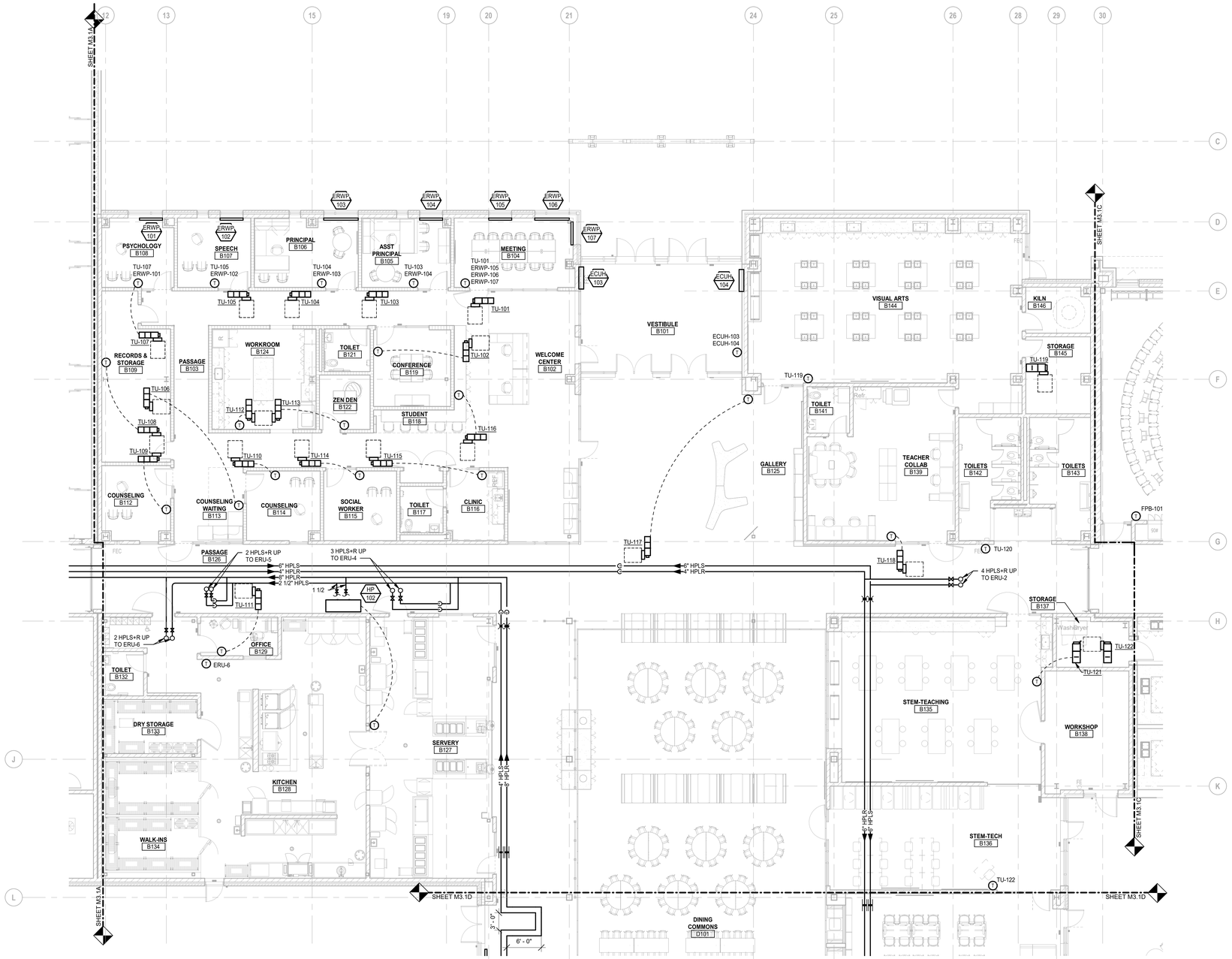

FIRST LEVEL HVAC PIPING PLAN - ZONE 'B'

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

HVAC PIPING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
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. SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.
7. COORDINATE LOCATION OF DUCT-MOUNTED HYDRONIC DEVICES WITH SHEET METAL TRADES.
8. BRANCH PIPING SERVING TERMINAL UNIT HEATING COILS OR RADIANT CEILING PANELS SHALL BE 3/4" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING MORE THAN ONE TERMINAL UNIT HEATING COIL SHALL BE 1" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING HOT WATER UNIT HEATERS AND CABINET UNIT HEATERS SHALL BE 1" UNLESS OTHERWISE NOTED.
9. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

1. REFER TO M6.5 FOR HEAT PUMP LOOP SYSTEM PIPING DIAGRAM.
2. 4 HPL SYSTEM FLOW BYPASS (150 GPM).

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PBA Project No.: 2023.0154

PROJECT TITLE

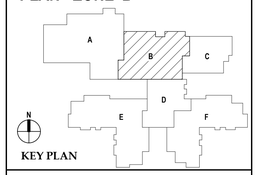
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL HVAC PIPING PLAN - ZONE 'B'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	WTF
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M3.1B

6/28/2024 9:23:58 AM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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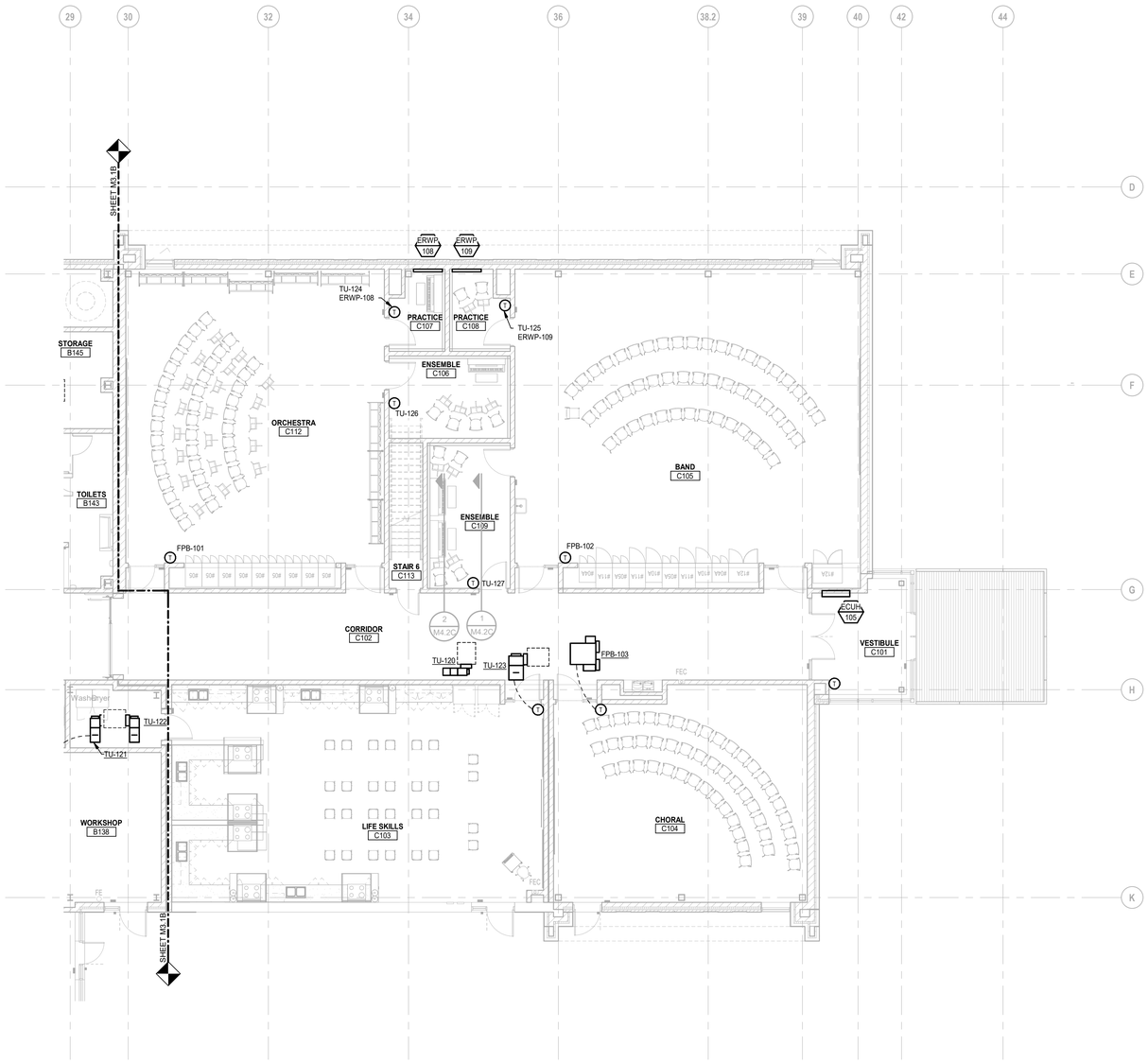

FIRST LEVEL HVAC PIPING PLAN - ZONE 'C'

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

HVAC PIPING GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

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 SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.

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

CONSTRUCTION KEY NOTES:

1 REFER TO M6.5 FOR HEAT PUMP LOOP SYSTEM PIPING DIAGRAM.

2 4 HPL SYSTEM FLOW BYPASS (150 GPM).

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

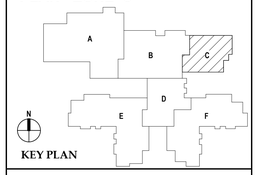
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL HVAC PIPING PLAN - ZONE 'C'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	WTF
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M3.1C

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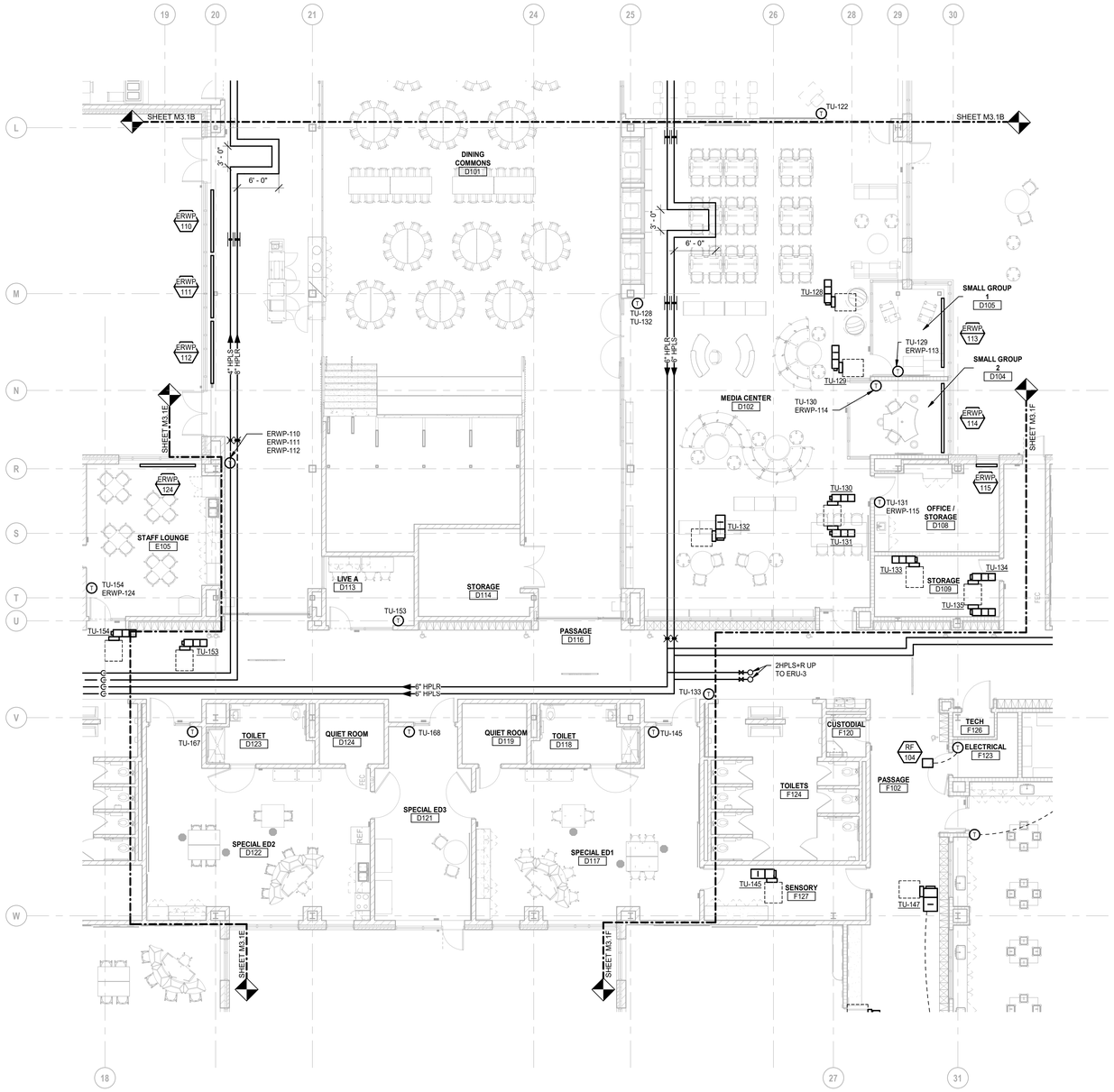

FIRST LEVEL HVAC PIPING PLAN - ZONE 'D'

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

HVAC PIPING GENERAL NOTES:

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5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.
7. COORDINATE LOCATION OF DUCT-MOUNTED HYDRONIC DEVICES WITH SHEET METAL TRADES.
8. BRANCH PIPING SERVING TERMINAL UNIT HEATING COILS OR RADIANT CEILING PANELS SHALL BE 3/4" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING MORE THAN ONE TERMINAL UNIT HEATING COIL SHALL BE 1" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING HOT WATER UNIT HEATERS AND CABINET UNIT HEATERS SHALL BE 1" UNLESS OTHERWISE NOTED.
9. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

1. REFER TO M6.5 FOR HEAT PUMP LOOP SYSTEM PIPING DIAGRAM.
2. 4 HPL SYSTEM FLOW BYPASS (150 GPM).

TMP ARCHITECTURE

TMP ARCHITECTURE INC

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www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

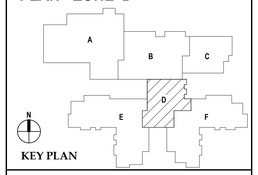
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL HVAC PIPING PLAN - ZONE 'D'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	WTF
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

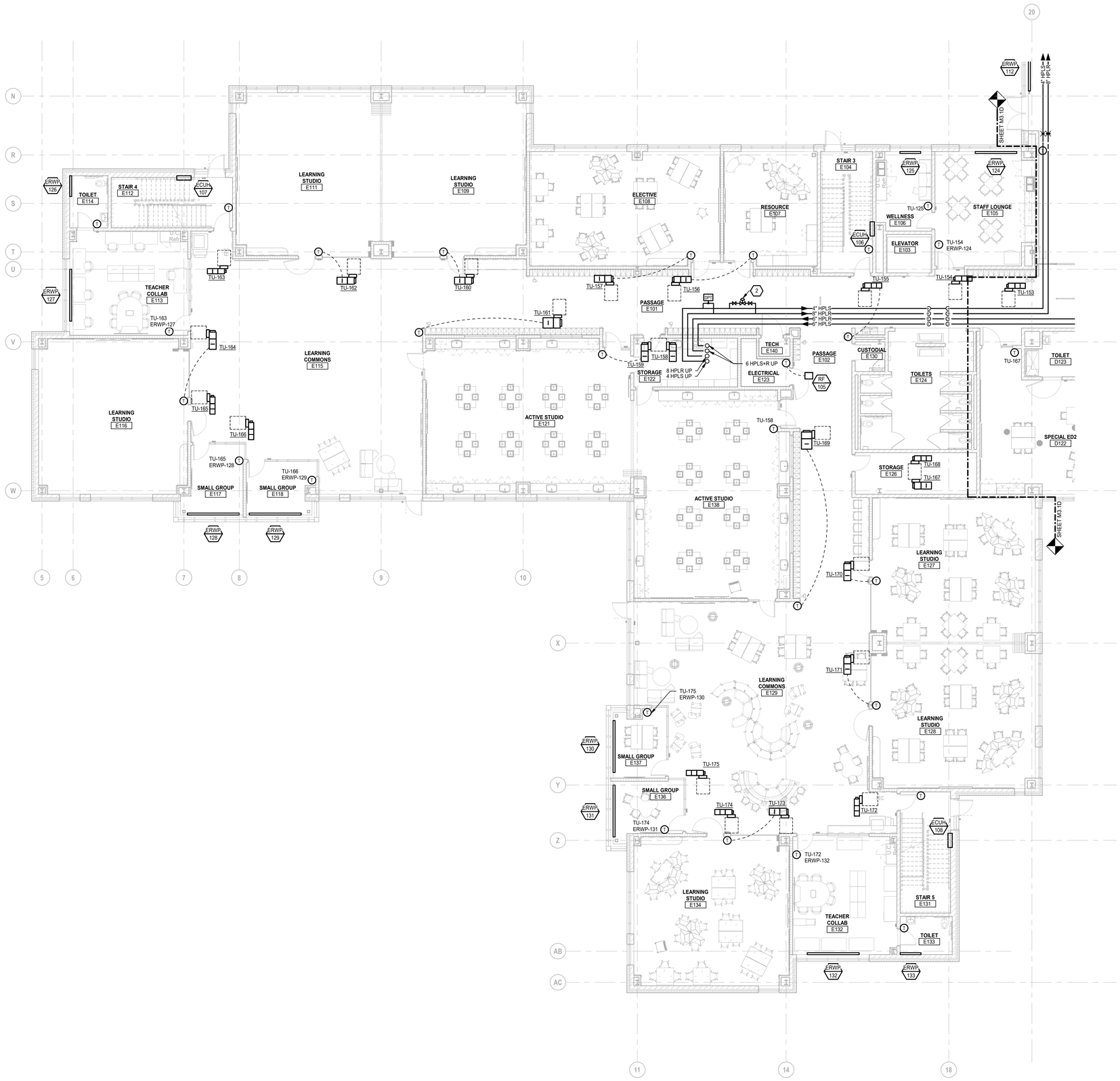
22102

DRAWING NO.

M3.1D

6/17/2024 12:53:32 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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



FIRST LEVEL HVAC PIPING PLAN - ZONE 'E'

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

HVAC PIPING GENERAL NOTES:

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CONSTRUCTION KEY NOTES:

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PROJECT TITLE

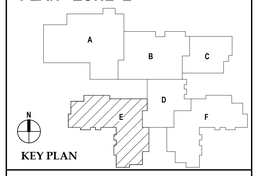
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL HVAC PIPING PLAN - ZONE 'E'



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DRAWN	WTF
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APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M3.1E

6/17/2024 12:53:39 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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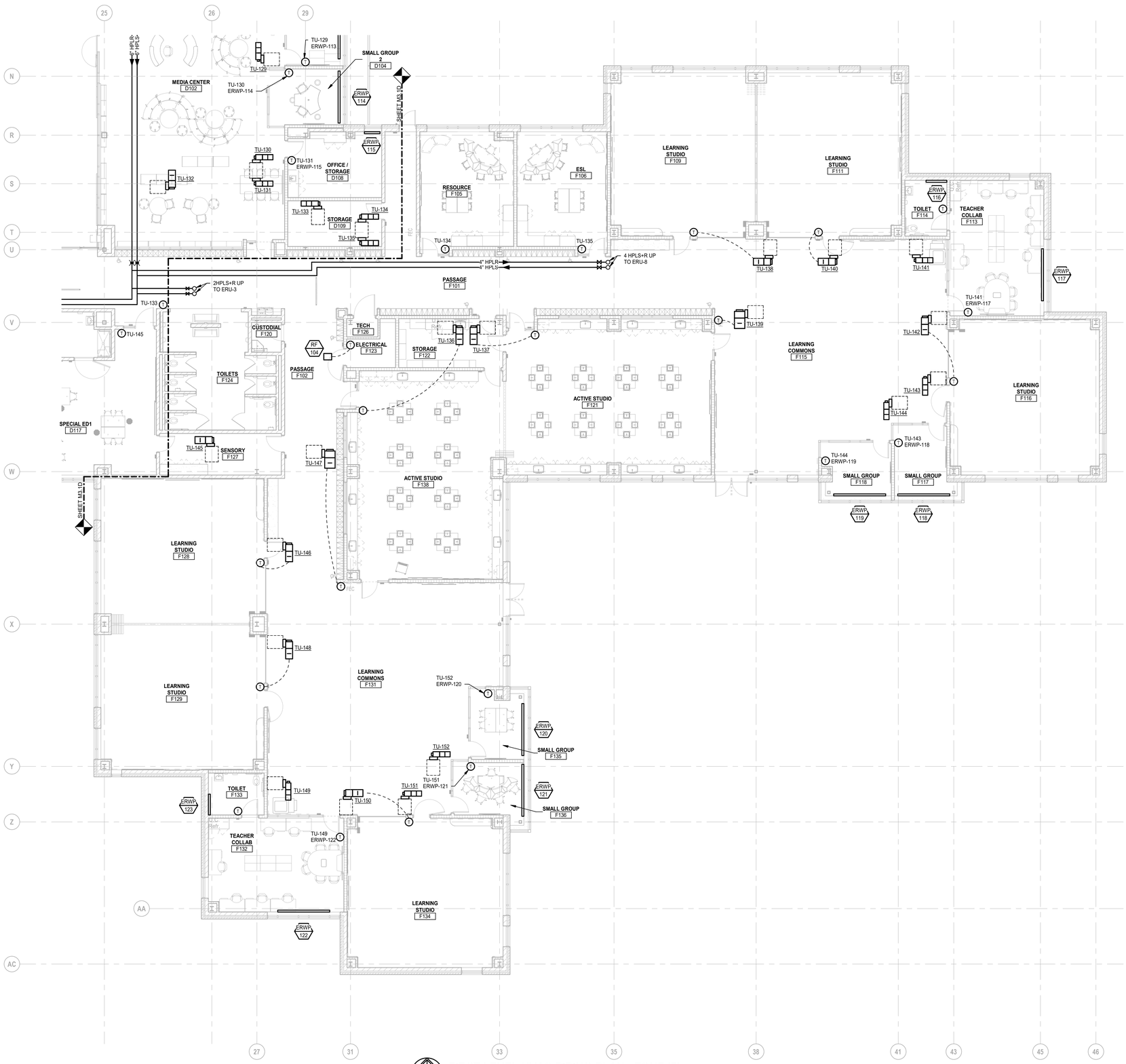

FIRST LEVEL HVAC PIPING PLAN - ZONE 'F'

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

HVAC PIPING GENERAL NOTES:

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CONSTRUCTION KEY NOTES:

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2 4 HPL SYSTEM FLOW BYPASS (150 GPM).

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PROJECT TITLE

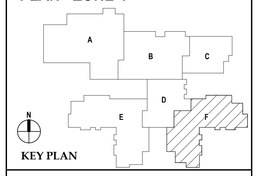
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL HVAC PIPING PLAN - ZONE 'F'



KEY PLAN

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CHECKED	KLH
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22102

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M3.1F

6/17/2024 12:53:44 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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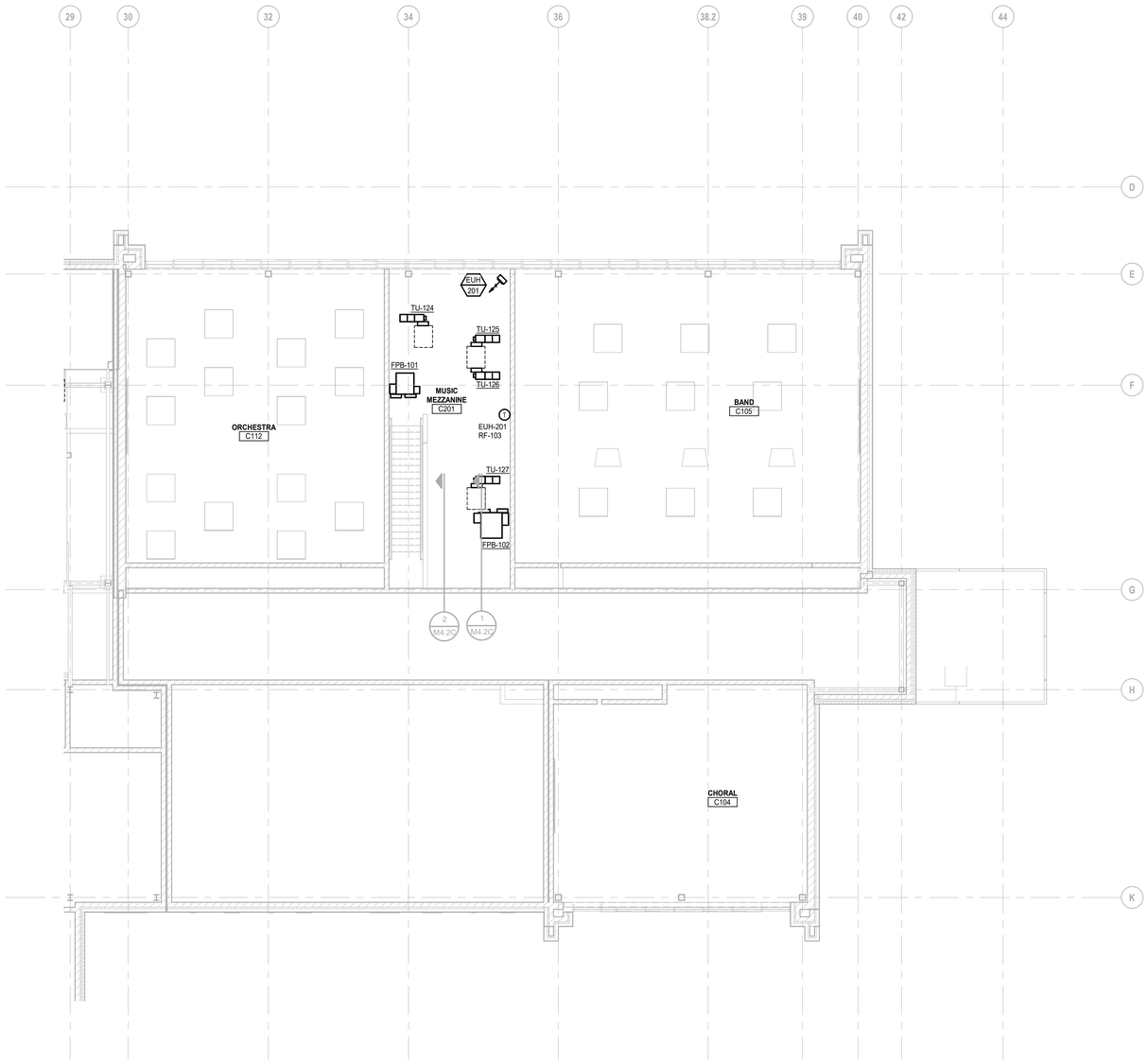

MEZZANINE LEVEL HVAC PIPING PLAN - ZONE 'C'

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

HVAC PIPING GENERAL NOTES:

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CONSTRUCTION KEY NOTES:

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2 4 HPL SYSTEM FLOW BYPASS (150 GPM).

TMP ARCHITECTURE

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PROJECT TITLE

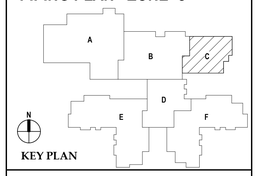
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

MEZZANINE LEVEL HVAC PIPING PLAN - ZONE 'C'



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DRAWN	WTF
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PROJECT NO.

22102

DRAWING NO.

M3.2C

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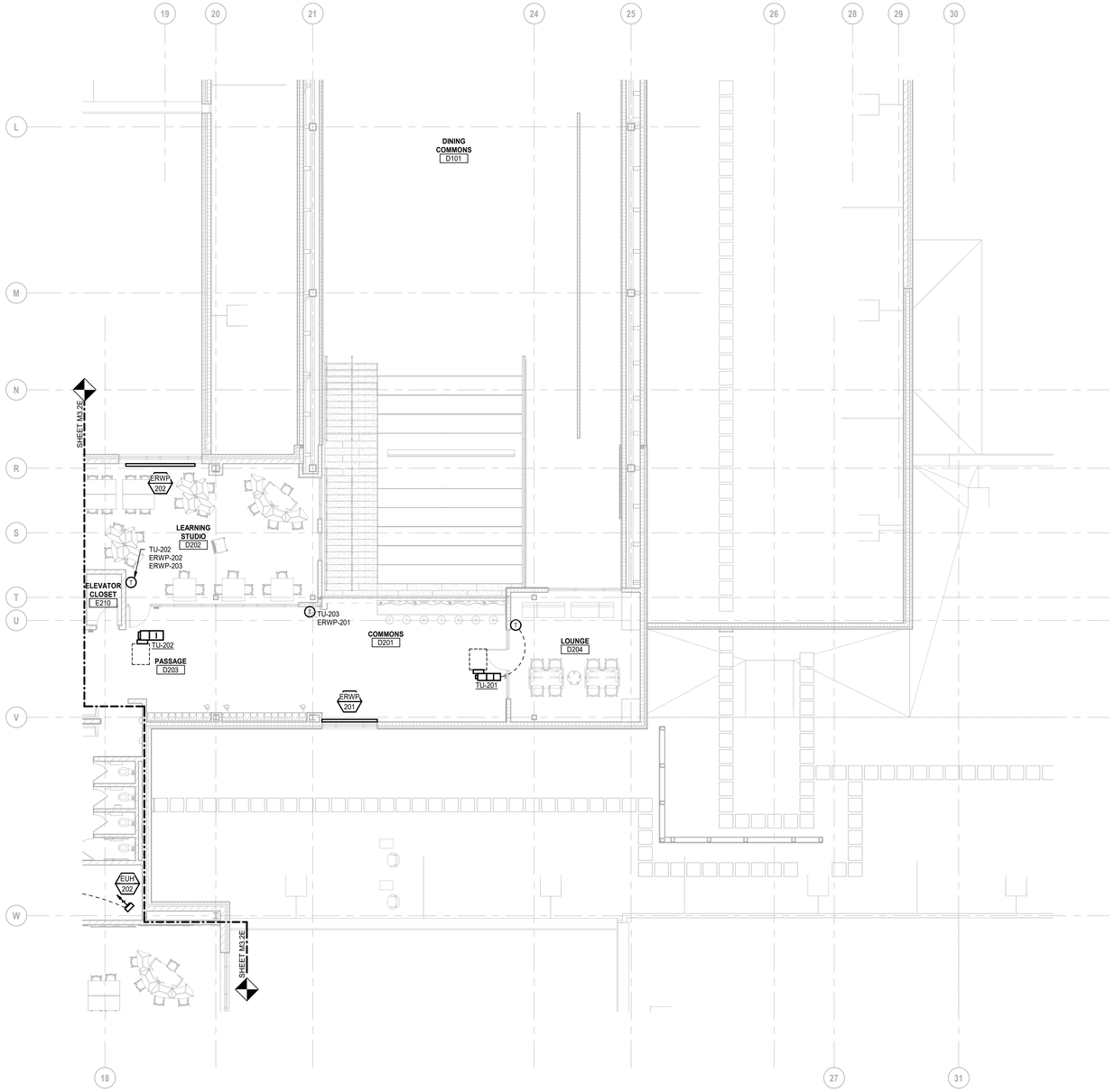

SECOND LEVEL HVAC PIPING PLAN - ZONE 'D'

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PROJECT TITLE

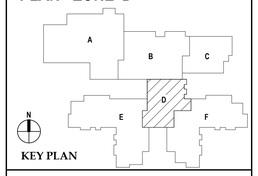
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL HVAC PIPING PLAN - ZONE 'D'



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22102

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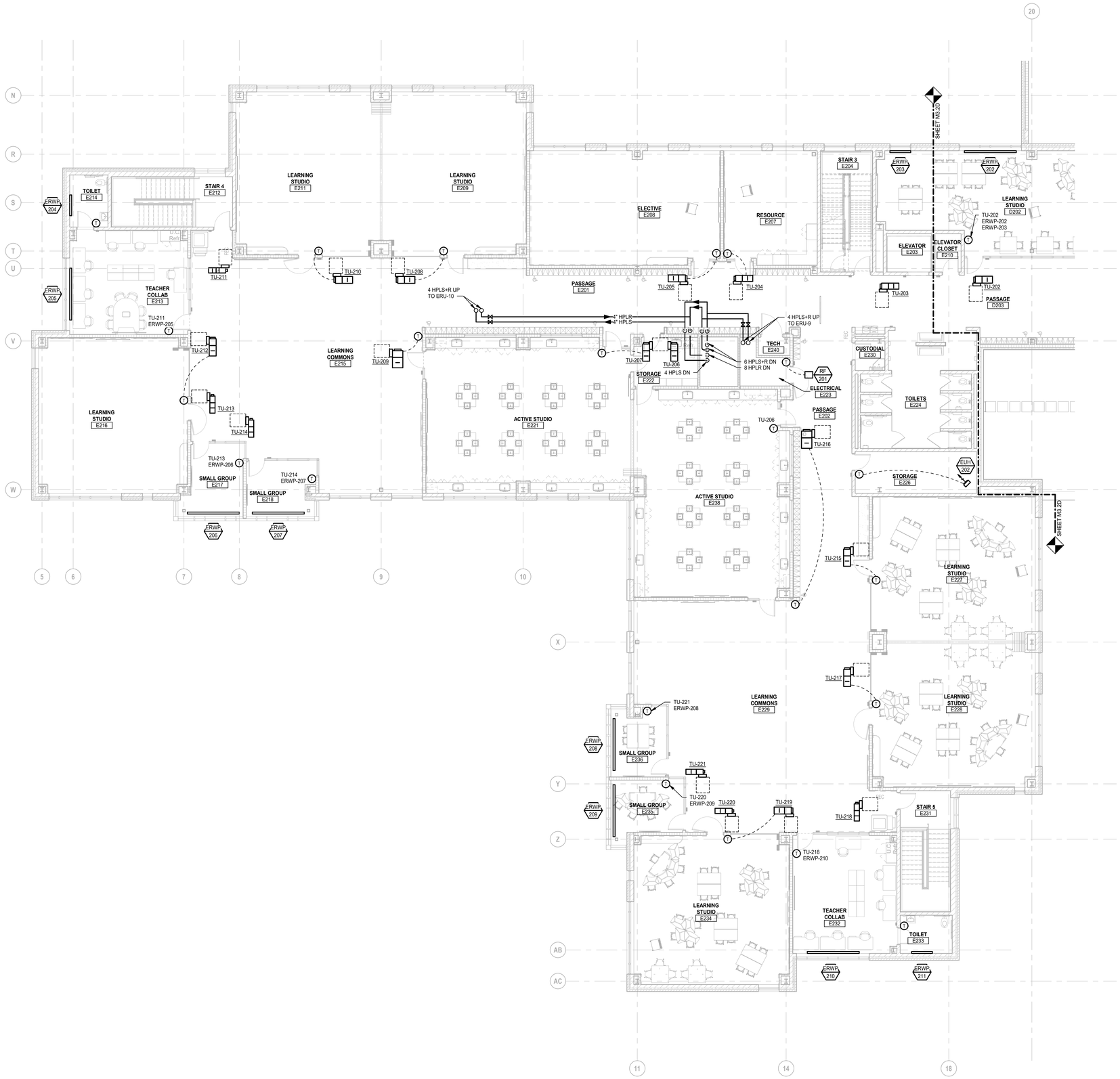

SECOND LEVEL HVAC PIPING PLAN - ZONE 'E'

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CONSTRUCTION KEY NOTES:

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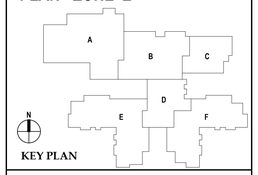
DRAWING TITLE

SECOND LEVEL HVAC PIPING PLAN - ZONE 'E'



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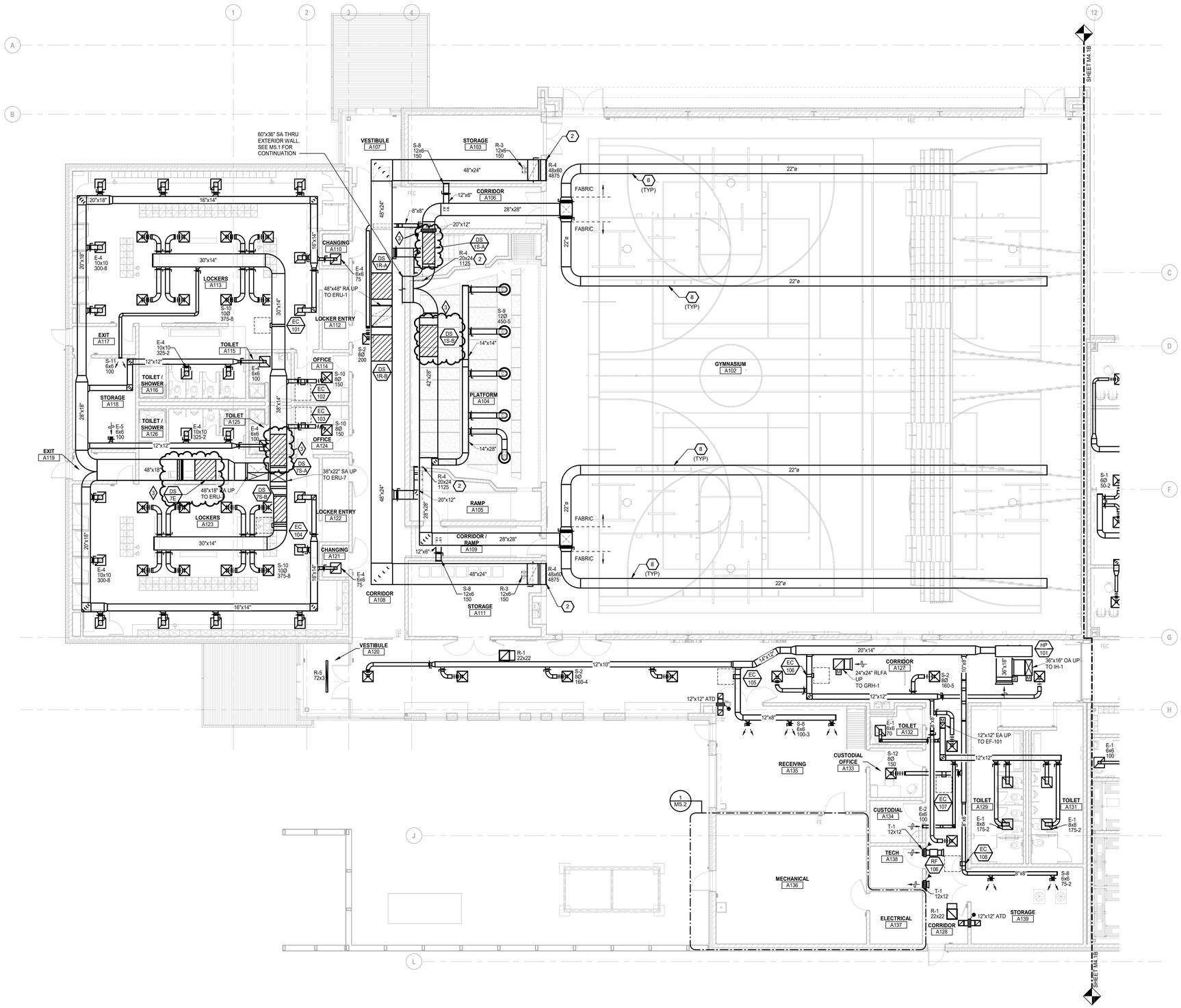

FIRST LEVEL SHEET METAL PLAN - ZONE 'A'

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

SHEET METAL GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. RELOCATED KILN BY OWNER. ROUTE 6ø INCHES EXHAUST CONNECTION FROM KILN UP THROUGH ROOF AND TERMINATE WITH VENT CAP. KILN EXHAUST SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER RECOMMENDATIONS.
2. MOUNT BOTTOM OF GRILLE 8 INCHES A.F.F.
3. ROUTE 6ø DRYER EXHAUST UP THROUGH ROOF AND TERMINATE WITH GOOSENECK.
4. PROVIDE DIGITAL TIMER FOR INDICATED EF.
5. REFER TO LEARNING STUDIO E128 FOR TYPICAL SHEET METAL LAYOUT.
6. REFER TO LEARNING STUDIO E134 FOR TYPICAL SHEET METAL LAYOUT.
7. REFER TO ACTIVE STUDIO F138 FOR TYPICAL SHEET METAL LAYOUT.
8. PROVIDE FABRIC DUCTWORK IN GYMNASIUM. MECHANICAL CONTRACTOR TO COORDINATE LAYOUT WITH STRUCTURAL STEEL AND JOIST CONFIGURATION.
9. ROUTE GREASE DUCT FROM HOOD UP TO EXHAUST FAN.
10. ROUTE 6ø EA UP THROUGH ROOF TO ROOF CAP ACCESSORY.
11. BALANCE TO AIRFLOW INDICATED.
12. ROUTE 6ø EA THROUGH WALL TO BRICK VENT ACCESSORY.
13. PROVIDE DOUBLE WALLED DUCT.
14. DUCT LOCATED BENEATH STAIRS.
15. ROUTE DUCT TIGHT TO CEILING.
16. REFER TO FOOD SERVICE DRAWINGS FOR CONNECTION TO DISHWASHER.
17. 28x10 MAKEUP AIR CONNECTION TO HOOD.
18. PROVIDE 4" CONCRETE CURB AROUND ALL MEZZANINE FLOOR DUCT PENETRATIONS.
19. 24x12 SA STACKED ABOVE 24x12 EA.
20. 16x12 SA STACKED ABOVE 12x12 EA.

TMP ARCHITECTURE

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www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

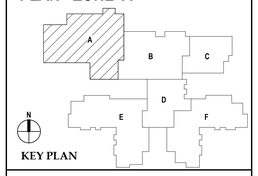
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL SHEET METAL PLAN - ZONE 'A'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-16-2024	ADDENDUM #3
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN JRB
CHECKED KLH
APPROVED SVM

PROJECT NO.
22102

DRAWING NO.
M4.1A

7/15/2024 1:14:29 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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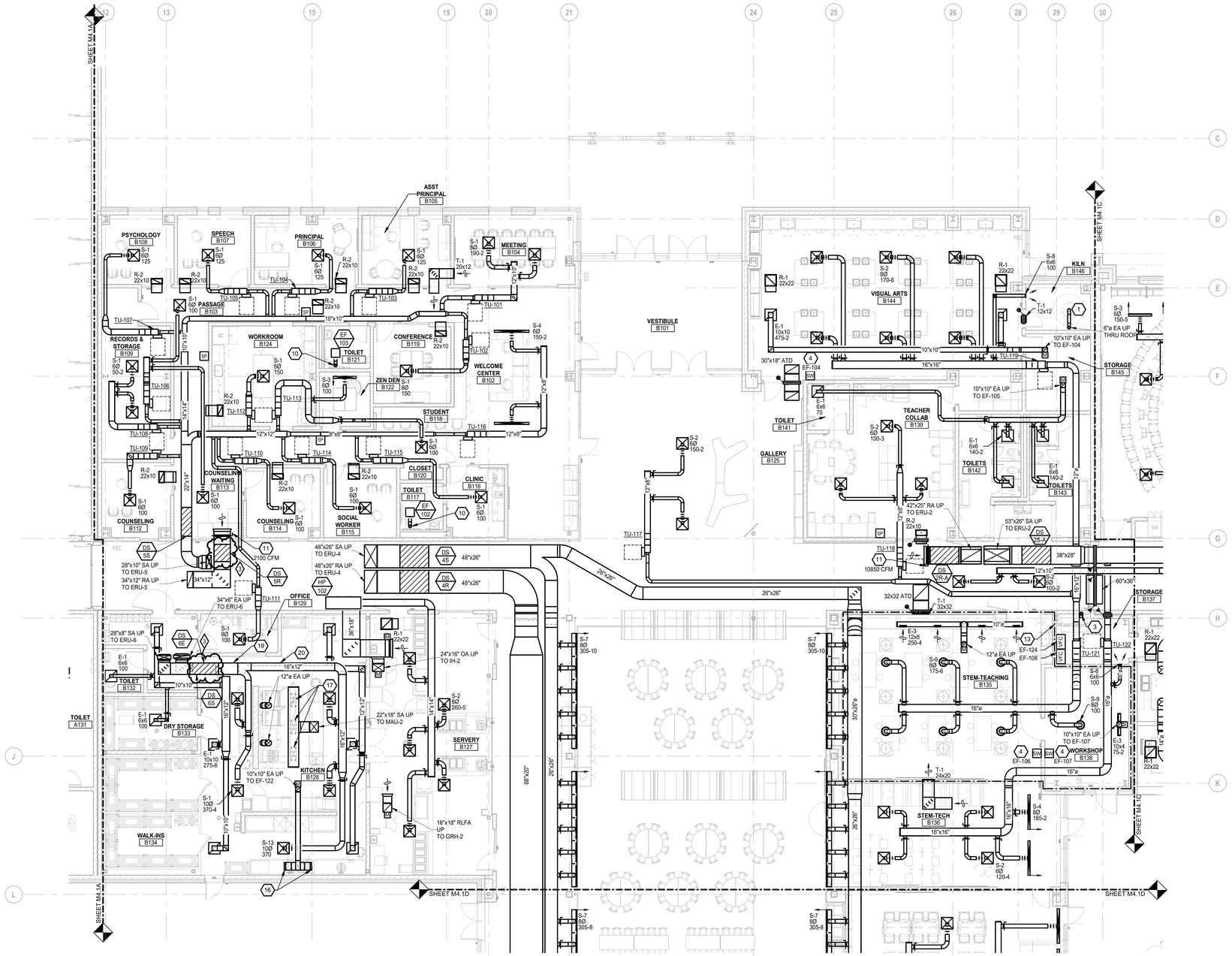

FIRST LEVEL SHEET METAL PLAN - ZONE 'B'

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

SHEET METAL GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

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

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

CONSTRUCTION KEY NOTES:

1 RELOCATED KILN BY OWNER. ROUTE 6ø INCHES EXHAUST CONNECTION FROM KILN UP THROUGH ROOF AND TERMINATE WITH VENT CAP. KILN EXHAUST SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER RECOMMENDATIONS.

2 MOUNT BOTTOM OF GRILLE 8 INCHES A.F.F.

3 ROUTE 6ø DRYER EXHAUST UP THROUGH ROOF AND TERMINATE WITH GOOSENECK.

4 PROVIDE DIGITAL TIMER FOR INDICATED EF.

5 REFER TO LEARNING STUDIO E128 FOR TYPICAL SHEET METAL LAYOUT.

6 REFER TO LEARNING STUDIO E134 FOR TYPICAL SHEET METAL LAYOUT.

7 REFER TO ACTIVE STUDIO F138 FOR TYPICAL SHEET METAL LAYOUT.

8 PROVIDE FABRIC DUCTWORK IN GYMNASIUM. MECHANICAL CONTRACTOR TO COORDINATE LAYOUT WITH STRUCTURAL STEEL AND JOIST CONFIGURATION.

9 ROUTE GREASE DUCT FROM HOOD UP TO EXHAUST FAN.

10 ROUTE 6ø EA UP THROUGH ROOF TO ROOF CAP ACCESSORY.

11 BALANCE TO AIRFLOW INDICATED.

12 ROUTE 6ø EA THROUGH WALL TO BRICK VENT ACCESSORY.

13 PROVIDE DOUBLE WALLED DUCT.

14 DUCT LOCATED BENEATH STAIRS.

15 ROUTE DUCT TIGHT TO CEILING.

16 REFER TO FOOD SERVICE DRAWINGS FOR CONNECTION TO DISHWASHER.

17 28x10 MAKEUP AIR CONNECTION TO HOOD.

18 PROVIDE 4" CONCRETE CURB AROUND ALL MEZZANINE FLOOR DUCT PENETRATIONS.

19 24x12 SA STACKED ABOVE 24x12 EA.

20 16x12 SA STACKED ABOVE 12x12 EA.

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

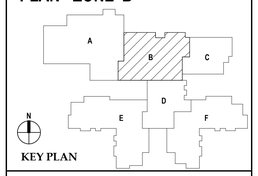
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL SHEET METAL PLAN - ZONE 'B'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-16-2024	ADDENDUM #3
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

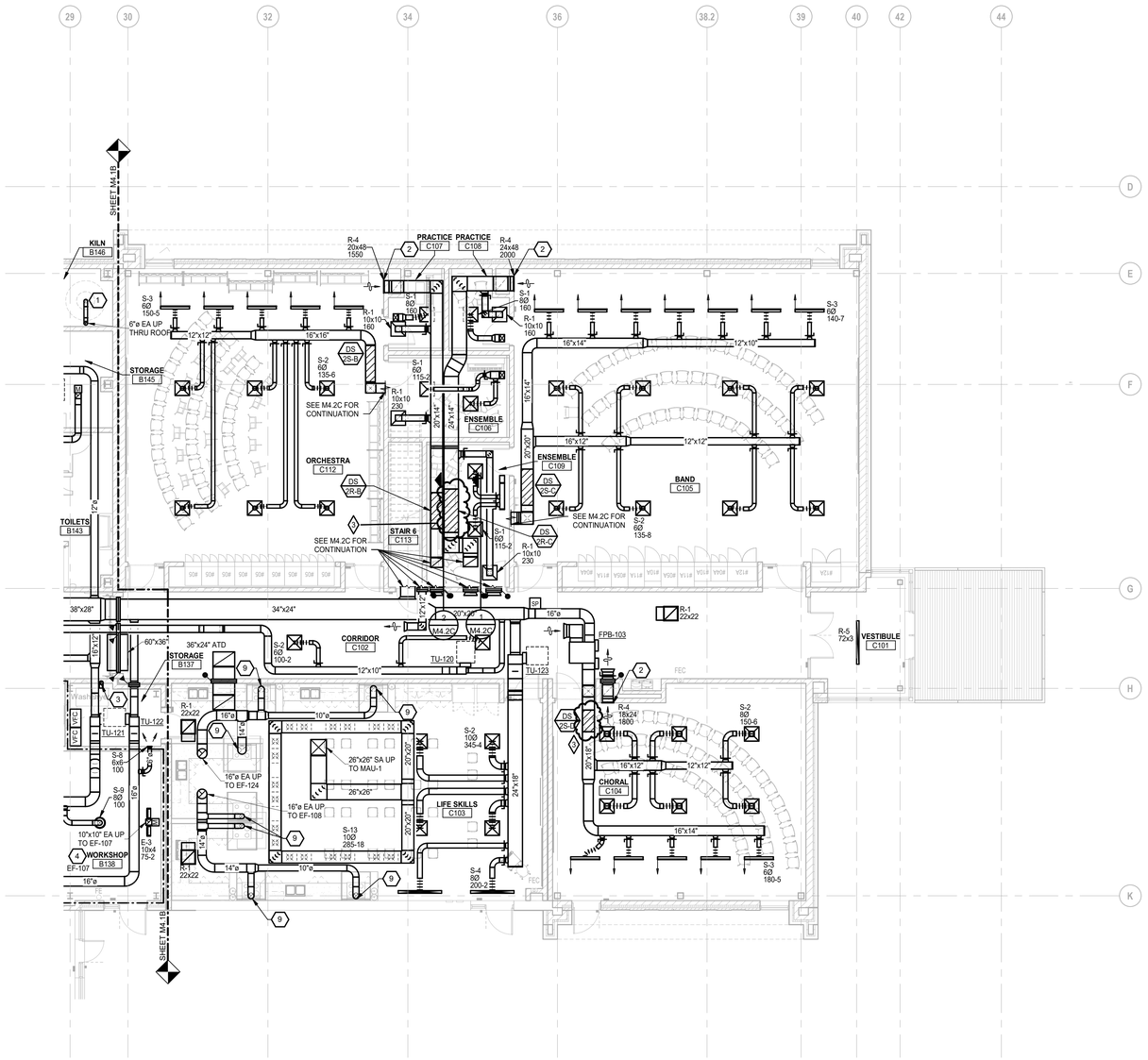
22102

DRAWING NO.

M4.1B

7/15/2024 1:14:50 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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



FIRST LEVEL SHEET METAL PLAN - ZONE 'C'

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

SHEET METAL GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. RELOCATED KILN BY OWNER. ROUTE 6ø INCHES EXHAUST CONNECTION FROM KILN UP THROUGH ROOF AND TERMINATE WITH VENT CAP. KILN EXHAUST SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER RECOMMENDATIONS.
2. MOUNT BOTTOM OF GRILLE 8 INCHES A.F.F.
3. ROUTE 6ø DRYER EXHAUST UP THROUGH ROOF AND TERMINATE WITH GOOSENECK.
4. PROVIDE DIGITAL TIMER FOR INDICATED EF.
5. REFER TO LEARNING STUDIO E128 FOR TYPICAL SHEET METAL LAYOUT.
6. REFER TO LEARNING STUDIO E134 FOR TYPICAL SHEET METAL LAYOUT.
7. REFER TO ACTIVE STUDIO F138 FOR TYPICAL SHEET METAL LAYOUT.
8. PROVIDE FABRIC DUCTWORK IN GYMNASIUM. MECHANICAL CONTRACTOR TO COORDINATE LAYOUT WITH STRUCTURAL STEEL AND JOIST CONFIGURATION.
9. ROUTE GREASE DUCT FROM HOOD UP TO EXHAUST FAN.
10. ROUTE 6ø EA UP THROUGH ROOF TO ROOF CAP ACCESSORY.
11. BALANCE TO AIRFLOW INDICATED.
12. ROUTE 6ø EA THROUGH WALL TO BRICK VENT ACCESSORY.
13. PROVIDE DOUBLE WALLED DUCT.
14. DUCT LOCATED BENEATH STAIRS.
15. ROUTE DUCT TIGHT TO CEILING.
16. REFER TO FOOD SERVICE DRAWINGS FOR CONNECTION TO DISHWASHER.
17. 28x10 MAKEUP AIR CONNECTION TO HOOD.
18. PROVIDE 4" CONCRETE CURB AROUND ALL MEZZANINE FLOOR DUCT PENETRATIONS.
19. 24x12 SA STACKED ABOVE 24x12 EA.
20. 16x12 SA STACKED ABOVE 12x12 EA.

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PBA Project No.: 2023.0154

PROJECT TITLE

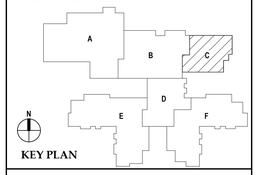
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL SHEET METAL PLAN - ZONE 'C'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-16-2024	ADDENDUM #3
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M4.1C

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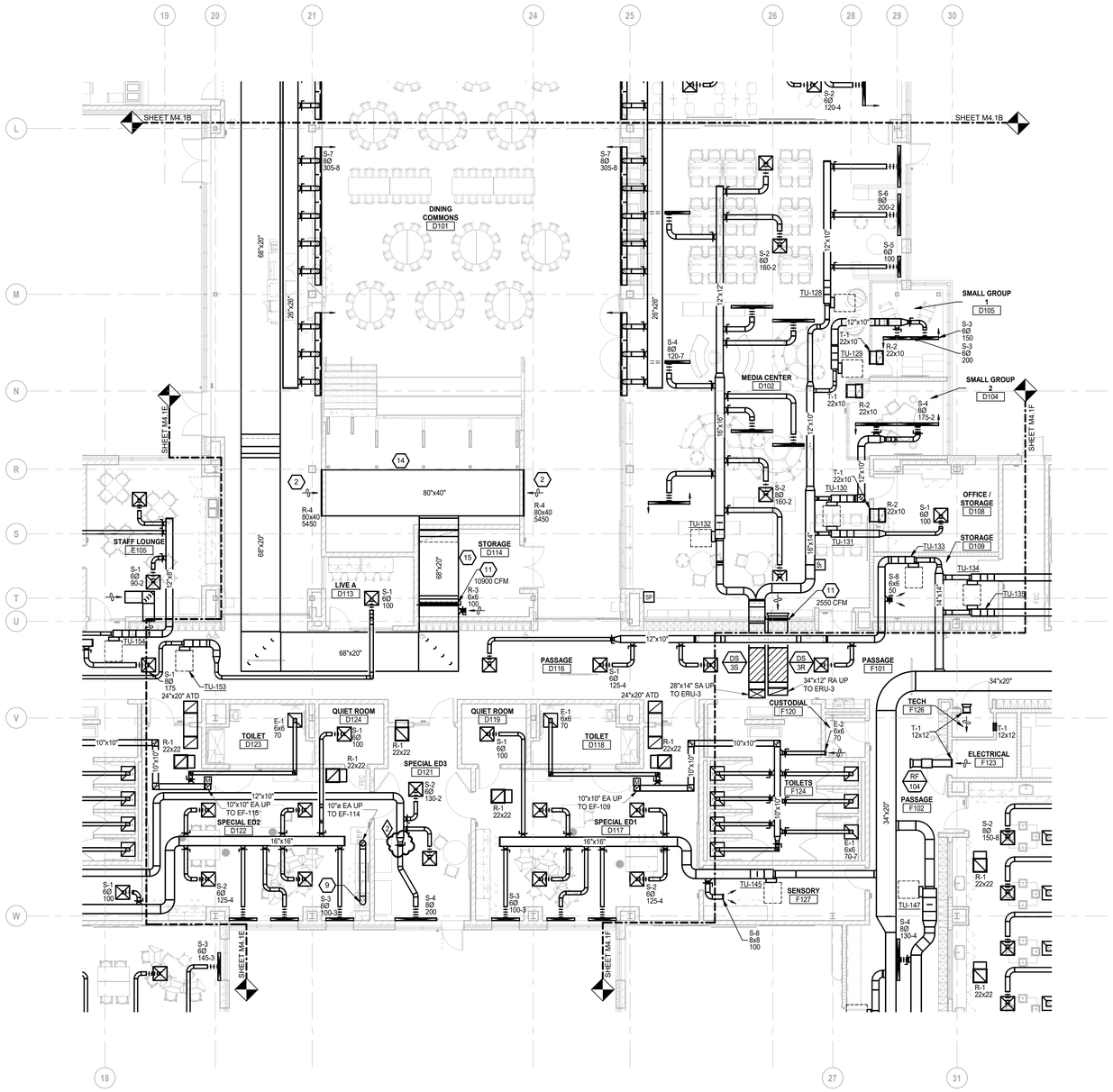

FIRST LEVEL SHEET METAL PLAN - ZONE 'D'

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

SHEET METAL GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. RELOCATED KILN BY OWNER. ROUTE 6ø INCHES EXHAUST CONNECTION FROM KILN UP THROUGH ROOF AND TERMINATE WITH VENT CAP. KILN EXHAUST SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER RECOMMENDATIONS.
2. MOUNT BOTTOM OF GRILLE 8 INCHES A.F.F.
3. ROUTE 6ø DRYER EXHAUST UP THROUGH ROOF AND TERMINATE WITH GOOSENECK.
4. PROVIDE DIGITAL TIMER FOR INDICATED EF.
5. REFER TO LEARNING STUDIO E128 FOR TYPICAL SHEET METAL LAYOUT.
6. REFER TO LEARNING STUDIO E134 FOR TYPICAL SHEET METAL LAYOUT.
7. REFER TO ACTIVE STUDIO F138 FOR TYPICAL SHEET METAL LAYOUT.
8. PROVIDE FABRIC DUCTWORK IN GYMNASIUM. MECHANICAL CONTRACTOR TO COORDINATE LAYOUT WITH STRUCTURAL STEEL AND JOIST CONFIGURATION.
9. ROUTE GREASE DUCT FROM HOOD UP TO EXHAUST FAN.
10. ROUTE 6ø EA UP THROUGH ROOF TO ROOF CAP ACCESSORY.
11. BALANCE TO AIRFLOW INDICATED.
12. ROUTE 6ø EA THROUGH WALL TO BRICK VENT ACCESSORY.
13. PROVIDE DOUBLE WALLED DUCT.
14. DUCT LOCATED BENEATH STAIRS.
15. ROUTE DUCT TIGHT TO CEILING.
16. REFER TO FOOD SERVICE DRAWINGS FOR CONNECTION TO DISHWASHER.
17. 28x10 MAKEUP AIR CONNECTION TO HOOD.
18. PROVIDE 4" CONCRETE CURB AROUND ALL MEZZANINE FLOOR DUCT PENETRATIONS.
19. 24x12 SA STACKED ABOVE 24x12 EA.
20. 16x12 SA STACKED ABOVE 12x12 EA.

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

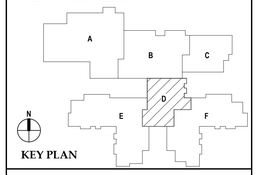
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL SHEET METAL PLAN - ZONE 'D'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M4.1D

7/11/2024 4:05:23 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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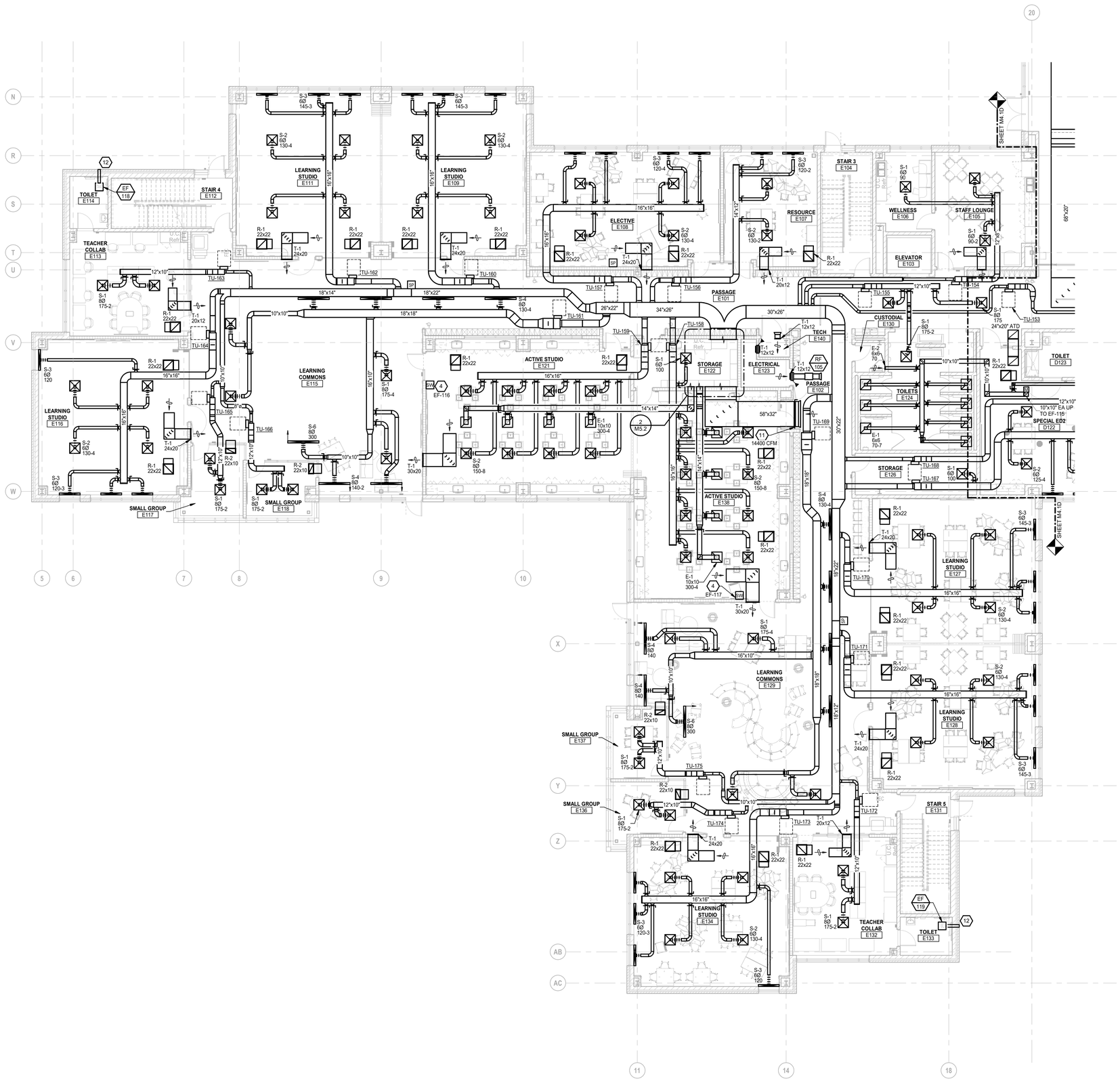

FIRST LEVEL SHEET METAL PLAN - ZONE 'E'

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

SHEET METAL GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. RELOCATED KILN BY OWNER. ROUTE 6ø INCHES EXHAUST CONNECTION FROM KILN UP THROUGH ROOF AND TERMINATE WITH VENT CAP. KILN EXHAUST SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER RECOMMENDATIONS.
2. MOUNT BOTTOM OF GRILLE 8 INCHES A.F.F.
3. ROUTE 6ø DRYER EXHAUST UP THROUGH ROOF AND TERMINATE WITH GOOSENECK.
4. PROVIDE DIGITAL TIMER FOR INDICATED EF.
5. REFER TO LEARNING STUDIO E128 FOR TYPICAL SHEET METAL LAYOUT.
6. REFER TO LEARNING STUDIO E134 FOR TYPICAL SHEET METAL LAYOUT.
7. REFER TO ACTIVE STUDIO F138 FOR TYPICAL SHEET METAL LAYOUT.
8. PROVIDE FABRIC DUCTWORK IN GYMNASIUM. MECHANICAL CONTRACTOR TO COORDINATE LAYOUT WITH STRUCTURAL STEEL AND JOIST CONFIGURATION.
9. ROUTE GREASE DUCT FROM HOOD UP TO EXHAUST FAN.
10. ROUTE 6ø EA UP THROUGH ROOF TO ROOF CAP ACCESSORY.
11. BALANCE TO AIRFLOW INDICATED.
12. ROUTE 6ø EA THROUGH WALL TO BRICK VENT ACCESSORY.
13. PROVIDE DOUBLE WALLED DUCT.
14. DUCT LOCATED BENEATH STAIRS.
15. ROUTE DUCT TIGHT TO CEILING.
16. REFER TO FOOD SERVICE DRAWINGS FOR CONNECTION TO DISHWASHER.
17. 28x10 MAKEUP AIR CONNECTION TO HOOD.
18. PROVIDE 4" CONCRETE CURB AROUND ALL MEZZANINE FLOOR DUCT PENETRATIONS.
19. 24x12 SA STACKED ABOVE 24x12 EA.
20. 16x12 SA STACKED ABOVE 12x12 EA.

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PROJECT TITLE

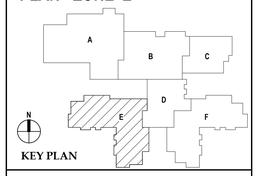
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL SHEET METAL PLAN - ZONE 'E'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M4.1E

6/17/2024 1:46:48 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v23.rvt

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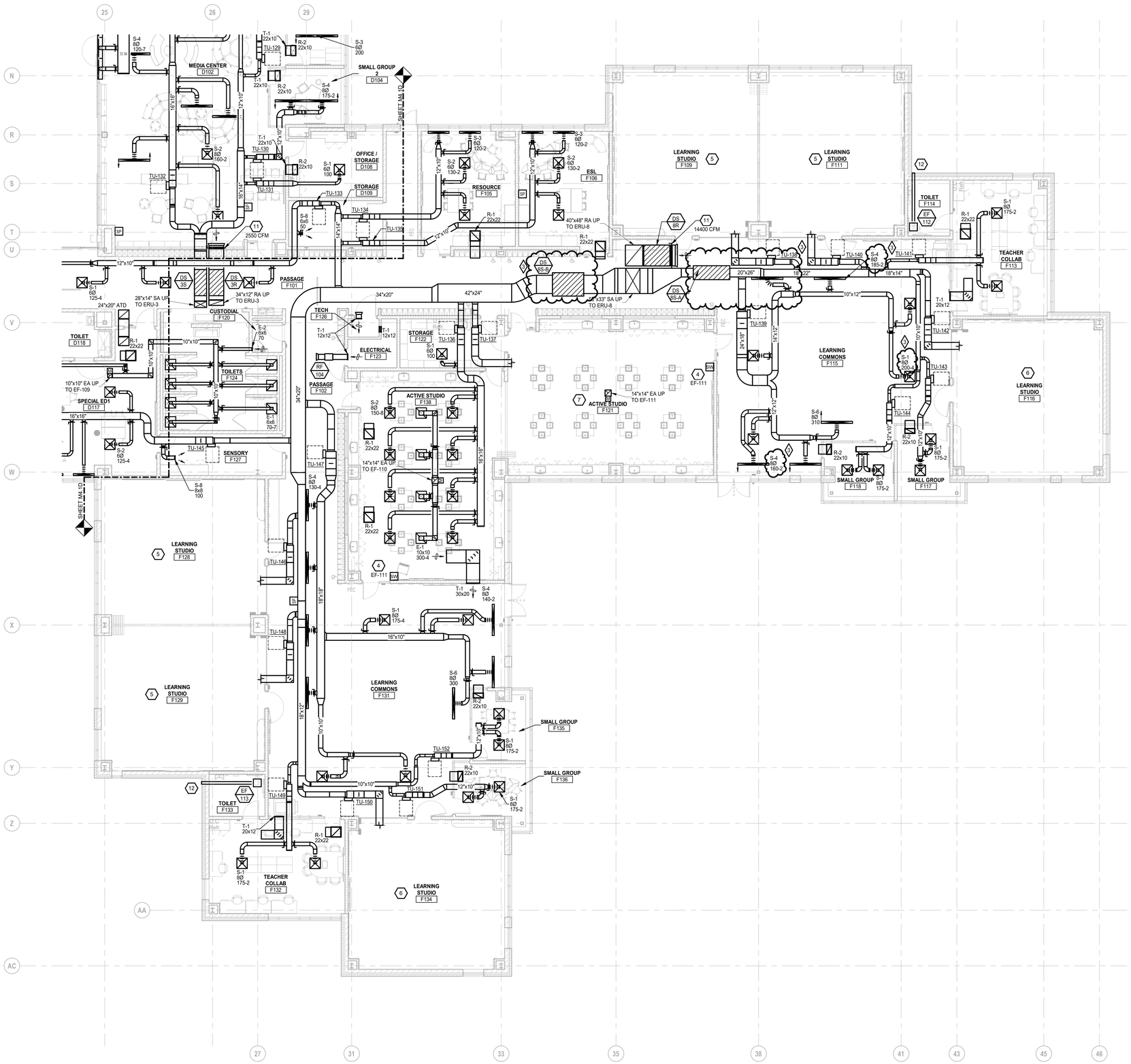

FIRST LEVEL SHEET METAL PLAN - ZONE 'F'

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

SHEET METAL GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. RELOCATED KILN BY OWNER. ROUTE 6ø INCHES EXHAUST CONNECTION FROM KILN UP THROUGH ROOF AND TERMINATE WITH VENT CAP. KILN EXHAUST SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER RECOMMENDATIONS.
2. MOUNT BOTTOM OF GRILLE 8 INCHES A.F.F.
3. ROUTE 6ø DRYER EXHAUST UP THROUGH ROOF AND TERMINATE WITH GOOSENECK.
4. PROVIDE DIGITAL TIMER FOR INDICATED EF.
5. REFER TO LEARNING STUDIO E128 FOR TYPICAL SHEET METAL LAYOUT.
6. REFER TO LEARNING STUDIO E134 FOR TYPICAL SHEET METAL LAYOUT.
7. REFER TO ACTIVE STUDIO F138 FOR TYPICAL SHEET METAL LAYOUT.
8. PROVIDE FABRIC DUCTWORK IN GYMNASIUM. MECHANICAL CONTRACTOR TO COORDINATE LAYOUT WITH STRUCTURAL STEEL AND JOIST CONFIGURATION.
9. ROUTE GREASE DUCT FROM HOOD UP TO EXHAUST FAN.
10. ROUTE 6ø EA UP THROUGH ROOF TO ROOF CAP ACCESSORY.
11. BALANCE TO AIRFLOW INDICATED.
12. ROUTE 6ø EA THROUGH WALL TO BRICK VENT ACCESSORY.
13. PROVIDE DOUBLE WALLED DUCT.
14. DUCT LOCATED BENEATH STAIRS.
15. ROUTE DUCT TIGHT TO CEILING.
16. REFER TO FOOD SERVICE DRAWINGS FOR CONNECTION TO DISHWASHER.
17. 28x10 MAKEUP AIR CONNECTION TO HOOD.
18. PROVIDE 4" CONCRETE CURB AROUND ALL MEZZANINE FLOOR DUCT PENETRATIONS.
19. 24x12 SA STACKED ABOVE 24x12 EA.
20. 16x12 SA STACKED ABOVE 12x12 EA.

TMP ARCHITECTURE

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www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

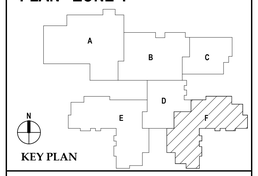
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL SHEET METAL PLAN - ZONE 'F'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-16-2024	ADDENDUM #3
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M4.1F

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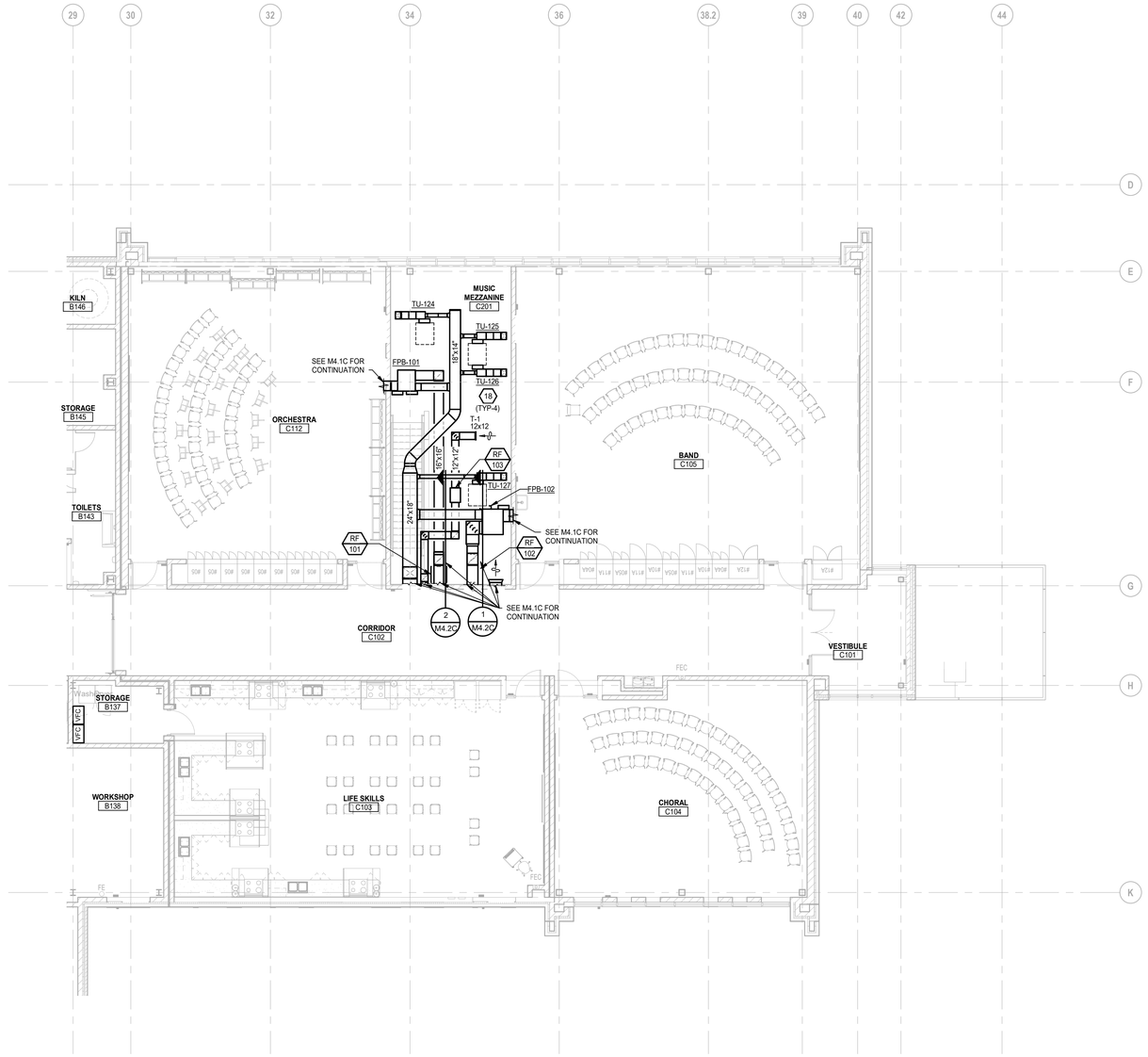
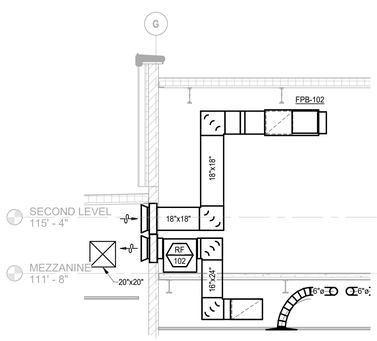


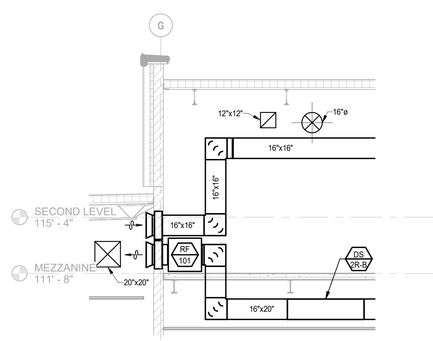
MEZZANINE LEVEL SHEET METAL PLAN - ZONE 'C'

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



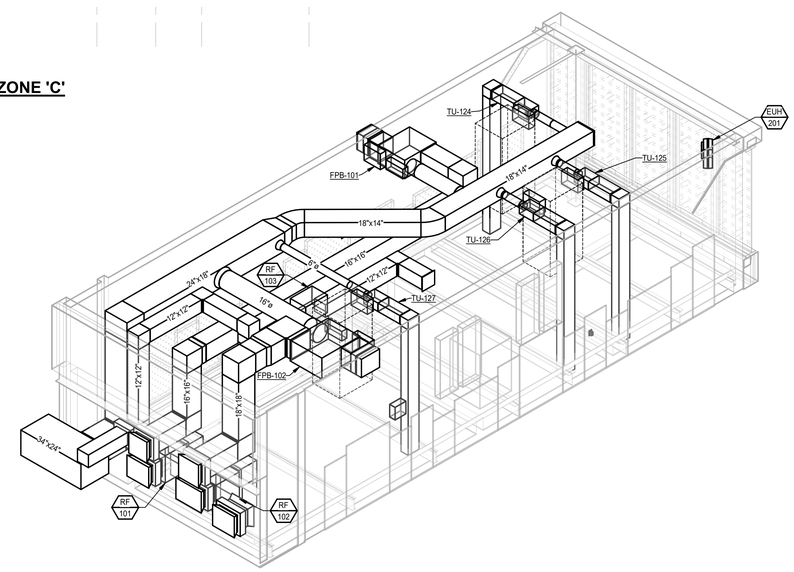
1 M4.2C **MEZZANINE SECTION 1**

SCALE: 1/4" = 1'-0"



2 M4.2C **MEZZANINE SECTION 2**

SCALE: 1/4" = 1'-0"



MEZZANINE ISOMETRIC

SHEET METAL GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. RELOCATED KILN BY OWNER. ROUTE 6ø INCHES EXHAUST CONNECTION FROM KILN UP THROUGH ROOF AND TERMINATE WITH VENT CAP. KILN EXHAUST SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER RECOMMENDATIONS.
2. MOUNT BOTTOM OF GRILLE 8 INCHES A.F.F.
3. ROUTE 6ø DRYER EXHAUST UP THROUGH ROOF AND TERMINATE WITH GOOSENECK.
4. PROVIDE DIGITAL TIMER FOR INDICATED EF.
5. REFER TO LEARNING STUDIO E128 FOR TYPICAL SHEET METAL LAYOUT.
6. REFER TO LEARNING STUDIO E134 FOR TYPICAL SHEET METAL LAYOUT.
7. REFER TO ACTIVE STUDIO F138 FOR TYPICAL SHEET METAL LAYOUT.
8. PROVIDE FABRIC DUCTWORK IN GYMNASIUM. MECHANICAL CONTRACTOR TO COORDINATE LAYOUT WITH STRUCTURAL STEEL AND JOIST CONFIGURATION.
9. ROUTE GREASE DUCT FROM HOOD UP TO EXHAUST FAN.
10. ROUTE 6ø EA UP THROUGH ROOF TO ROOF CAP ACCESSORY.
11. BALANCE TO AIRFLOW INDICATED.
12. ROUTE 6ø EA THROUGH WALL TO BRICK VENT ACCESSORY.
13. PROVIDE DOUBLE WALLED DUCT.
14. DUCT LOCATED BENEATH STAIRS.
15. ROUTE DUCT TIGHT TO CEILING.
16. REFER TO FOOD SERVICE DRAWINGS FOR CONNECTION TO DISHWASHER.
17. 28x10 MAKEUP AIR CONNECTION TO HOOD.
18. PROVIDE 4" CONCRETE CURB AROUND ALL MEZZANINE FLOOR DUCT PENETRATIONS.
19. 24x12 SA STACKED ABOVE 24x12 EA.
20. 16x12 SA STACKED ABOVE 12x12 EA.

TMP ARCHITECTURE

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www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

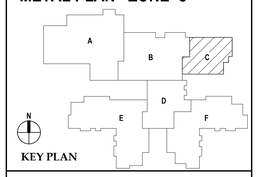
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

MEZZANINE LEVEL SHEET METAL PLAN - ZONE 'C'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M4.2C

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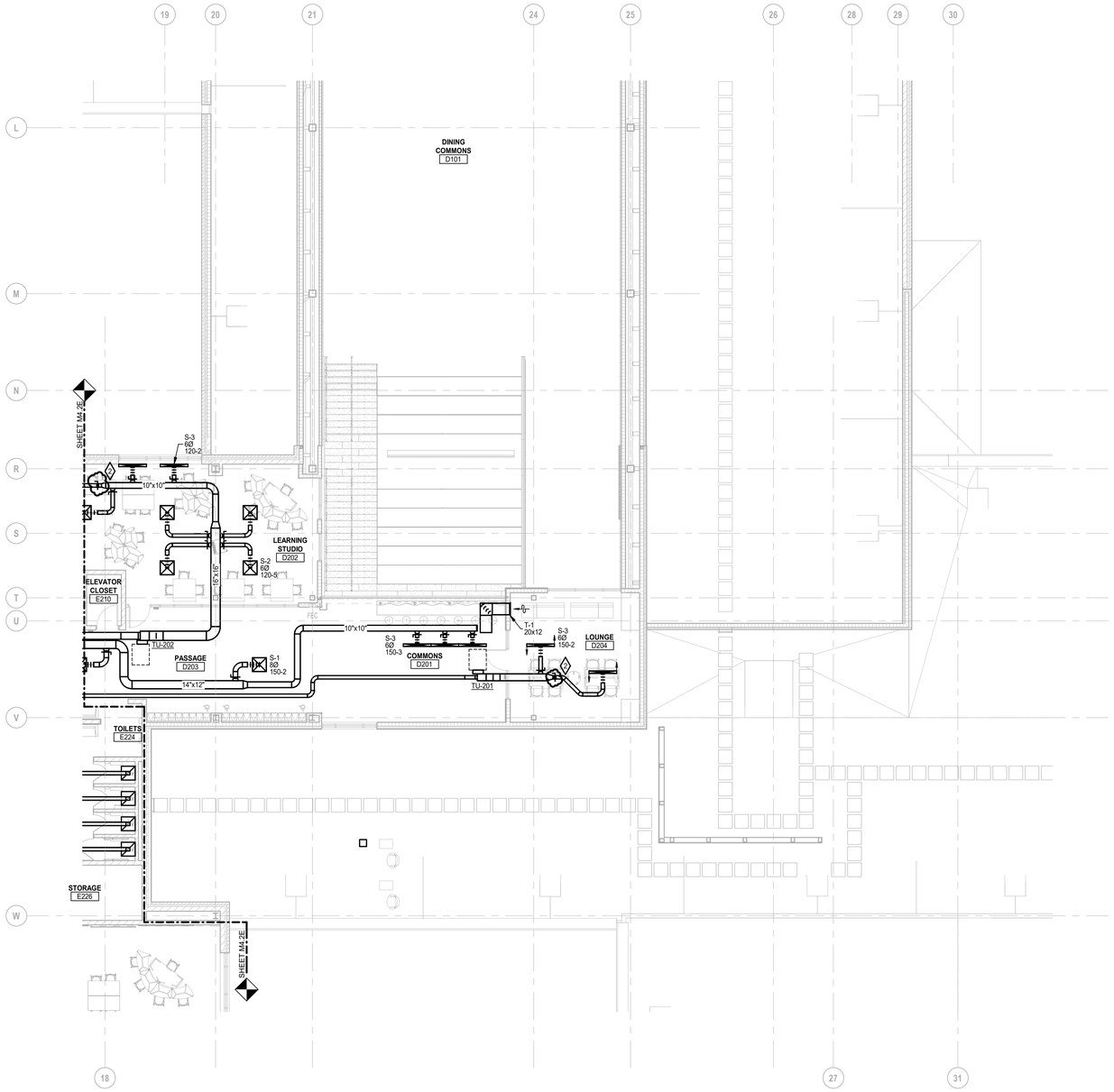

SECOND LEVEL SHEET METAL PLAN - ZONE 'D'

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

SHEET METAL GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. RELOCATED KILN BY OWNER. ROUTE 6ø INCHES EXHAUST CONNECTION FROM KILN UP THROUGH ROOF AND TERMINATE WITH VENT CAP. KILN EXHAUST SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER RECOMMENDATIONS.
2. MOUNT BOTTOM OF GRILLE 8 INCHES A.F.F.
3. ROUTE 6ø DRYER EXHAUST UP THROUGH ROOF AND TERMINATE WITH GOOSENECK.
4. PROVIDE DIGITAL TIMER FOR INDICATED EF.
5. REFER TO LEARNING STUDIO E128 FOR TYPICAL SHEET METAL LAYOUT.
6. REFER TO LEARNING STUDIO E134 FOR TYPICAL SHEET METAL LAYOUT.
7. REFER TO ACTIVE STUDIO F138 FOR TYPICAL SHEET METAL LAYOUT.
8. PROVIDE FABRIC DUCTWORK IN GYMNASIUM. MECHANICAL CONTRACTOR TO COORDINATE LAYOUT WITH STRUCTURAL STEEL AND JOIST CONFIGURATION.
9. ROUTE GREASE DUCT FROM HOOD UP TO EXHAUST FAN.
10. ROUTE 6ø EA UP THROUGH ROOF TO ROOF CAP ACCESSORY.
11. BALANCE TO AIRFLOW INDICATED.
12. ROUTE 6ø EA THROUGH WALL TO BRICK VENT ACCESSORY.
13. PROVIDE DOUBLE WALLED DUCT.
14. DUCT LOCATED BENEATH STAIRS.
15. ROUTE DUCT TIGHT TO CEILING.
16. REFER TO FOOD SERVICE DRAWINGS FOR CONNECTION TO DISHWASHER.
17. 28x10 MAKEUP AIR CONNECTION TO HOOD.
18. PROVIDE 4" CONCRETE CURB AROUND ALL MEZZANINE FLOOR DUCT PENETRATIONS.
19. 24x12 SA STACKED ABOVE 24x12 EA.
20. 16x12 SA STACKED ABOVE 12x12 EA.

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PBA Project No.: 2023.0154

PROJECT TITLE

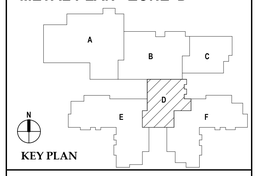
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL SHEET METAL PLAN - ZONE 'D'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M4.2D

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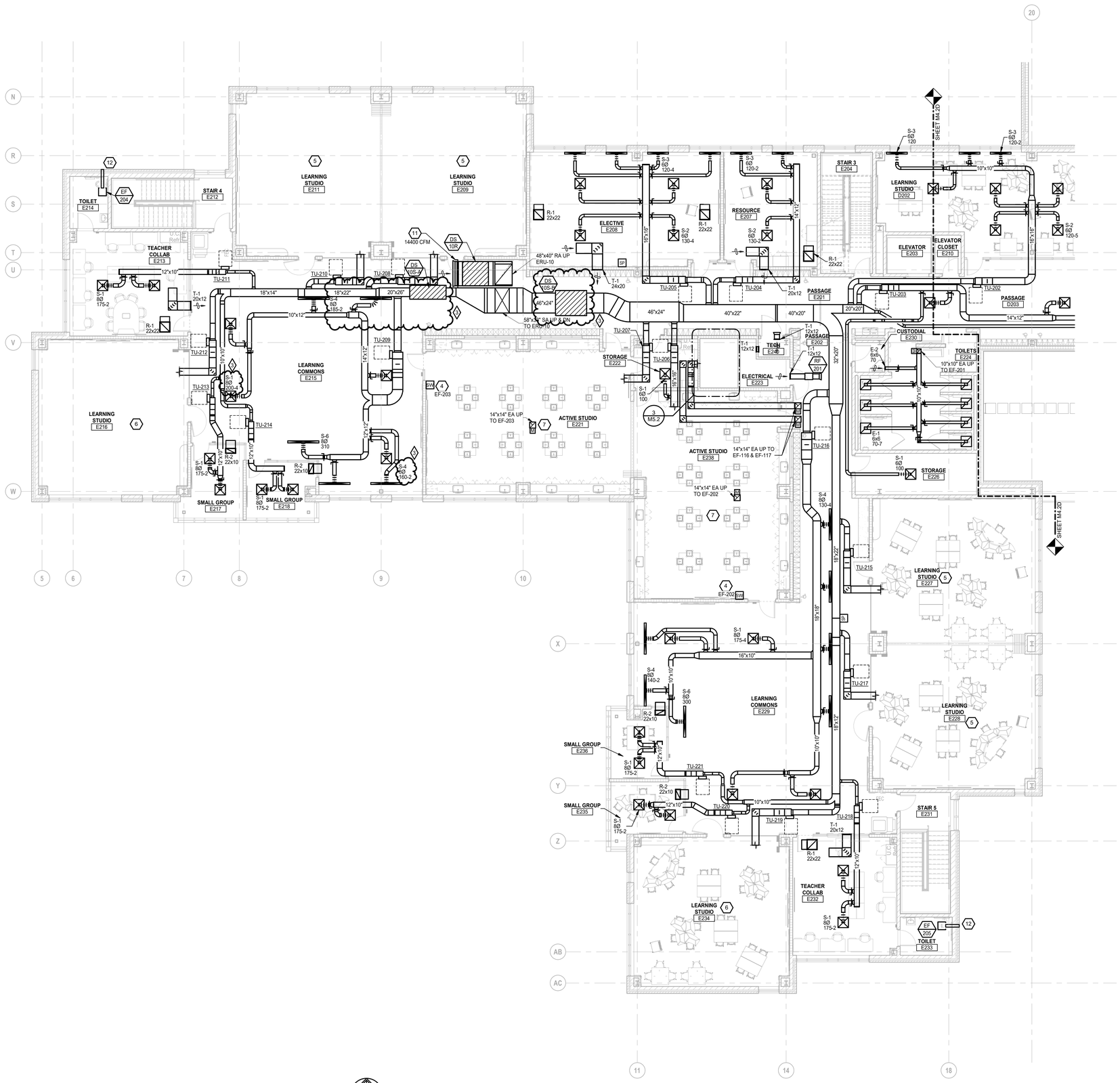

SECOND LEVEL SHEET METAL PLAN - ZONE 'E'

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

SHEET METAL GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
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5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
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CONSTRUCTION KEY NOTES:

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2. MOUNT BOTTOM OF GRILLE 8 INCHES A.F.F.
3. ROUTE 6ø DRYER EXHAUST UP THROUGH ROOF AND TERMINATE WITH GOOSENECK.
4. PROVIDE DIGITAL TIMER FOR INDICATED EF.
5. REFER TO LEARNING STUDIO E128 FOR TYPICAL SHEET METAL LAYOUT.
6. REFER TO LEARNING STUDIO E134 FOR TYPICAL SHEET METAL LAYOUT.
7. REFER TO ACTIVE STUDIO F138 FOR TYPICAL SHEET METAL LAYOUT.
8. PROVIDE FABRIC DUCTWORK IN GYMNASIUM. MECHANICAL CONTRACTOR TO COORDINATE LAYOUT WITH STRUCTURAL STEEL AND JOIST CONFIGURATION.
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11. BALANCE TO AIRFLOW INDICATED.
12. ROUTE 6ø EA THROUGH WALL TO BRICK VENT ACCESSORY.
13. PROVIDE DOUBLE WALLED DUCT.
14. DUCT LOCATED BENEATH STAIRS.
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16. REFER TO FOOD SERVICE DRAWINGS FOR CONNECTION TO DISHWASHER.
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PROJECT TITLE

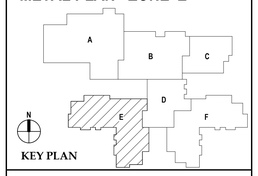
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL SHEET METAL PLAN - ZONE 'E'



KEY PLAN

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06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
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PROJECT NO.

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7/15/2024 1:15:46 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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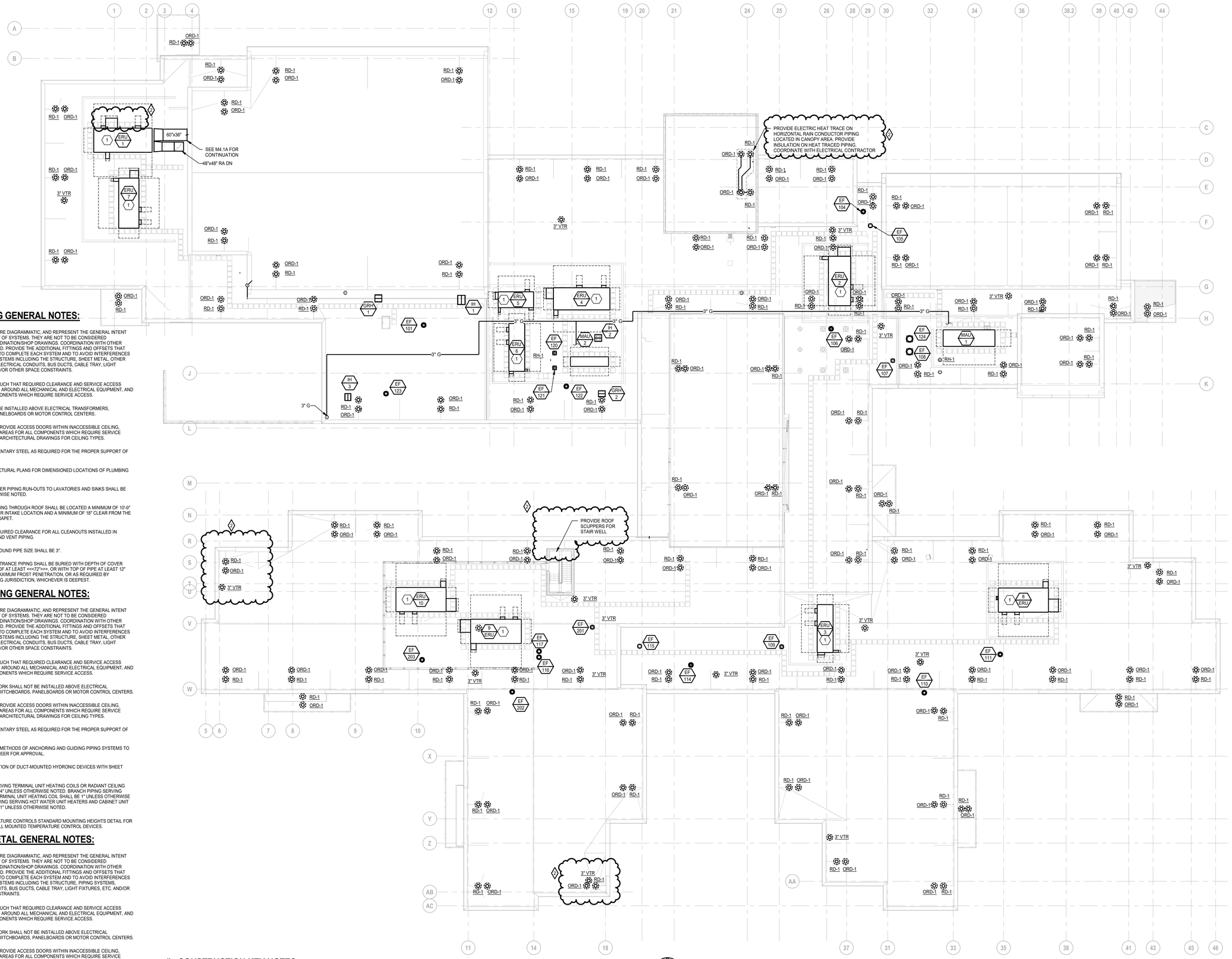

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2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.

7 HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.

8 PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.

9 PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.

10 MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

11 WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST <<72">>, OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

HVAC PIPING GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

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 SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.

7 COORDINATE LOCATION OF DUCT-MOUNTED HYDRONIC DEVICES WITH SHEET METAL TRADES.

8 BRANCH PIPING SERVING TERMINAL UNIT HEATING COILS OR RADIANT CEILING PANELS SHALL BE 3/4" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING MORE THAN ONE TERMINAL UNIT HEATING COIL SHALL BE 1" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING HOT WATER UNIT HEATERS AND CABINET UNIT HEATERS SHALL BE 1" UNLESS OTHERWISE NOTED.

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

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.

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5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

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

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

CONSTRUCTION KEY NOTES:

1 PROVIDE HEAT TRACE ON ERU CONDENSATE DRAIN AND INSULATE PIPING.

ROOF MECHANICAL PLAN

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

TMP ARCHITECTURE

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www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

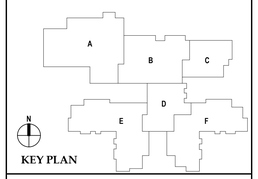
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

ROOF MECHANICAL PLAN



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	KLH
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

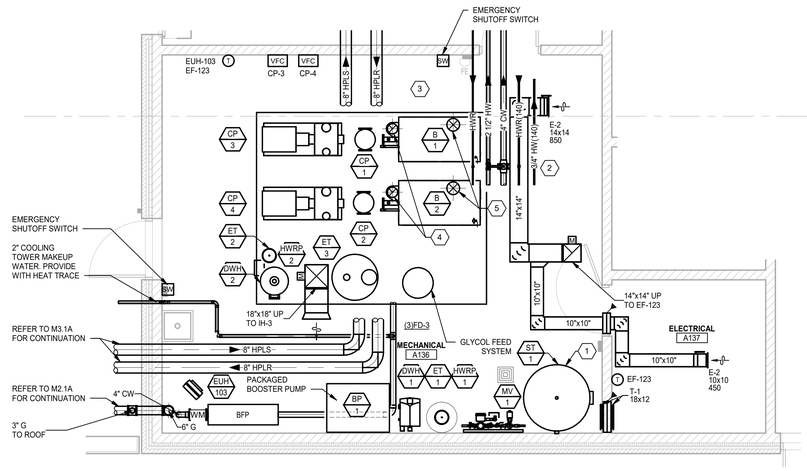
22102

DRAWING NO.

M5.1

7/11/2024 4:06:01 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

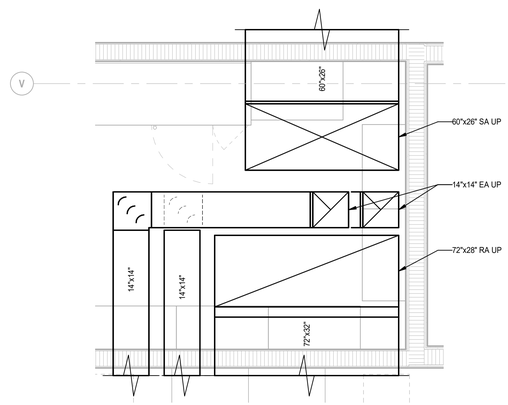
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



1 / M2.1A **ENLARGED MECHANICAL ROOM PLAN**

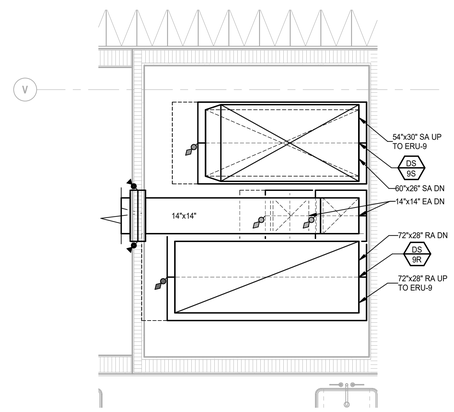
SCALE: 1/4" = 1'-0"

M3.1A, M4.1A



2 / M4.1E **FIRST LEVEL ENLARGED SHAFT PLAN**

SCALE: 1/2" = 1'-0"



3 / M4.2E **SECOND LEVEL ENLARGED SHAFT PLAN**

SCALE: 1/2" = 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.

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3 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

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5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.

7 HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.

8 PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.

9 PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.

10 MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

11 WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST <<<72">>>, OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

HVAC PIPING GENERAL NOTES:

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

SHEET METAL GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1 PROVIDE 650 GALLON HOT WATER STORAGE TANK.

2 COORDINATE PIPE ROUTING WITH ELECTRICAL PLANS TO AVOID ROUTING OVER ELECTRICAL EQUIPMENT.

3 REFER TO M6.5 FOR HEAT PUMP LOOP SYSTEM PIPING DIAGRAM.

4 8 INCH DIAMETER DOUBLE WALL AL294C VENT STACK FROM BOILER, UP THROUGH ROOF. PROVIDE INLINE MUFFLER.

5 10 INCH DIAMETER STAINLESS STEEL COMBUSTION AIR INTAKE FROM BOILER, UP THROUGH ROOF.

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

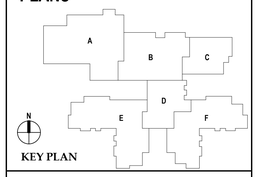
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

ENLARGED MECHANICAL PLANS



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	KLH
CHECKED	KLH
APPROVED	SVM

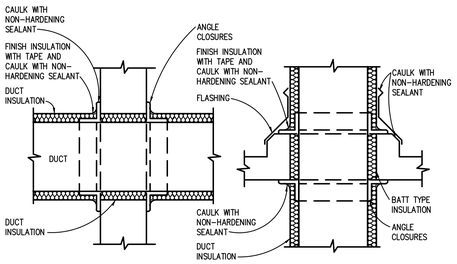
PROJECT NO.

22102

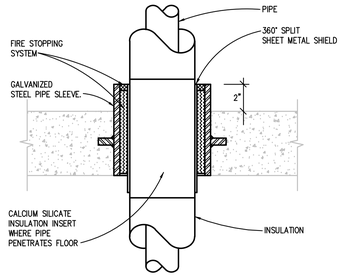
DRAWING NO.

M5.2

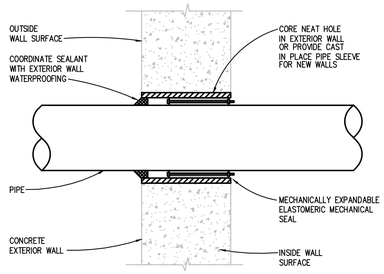
6/26/2024 9:24:59 AM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt



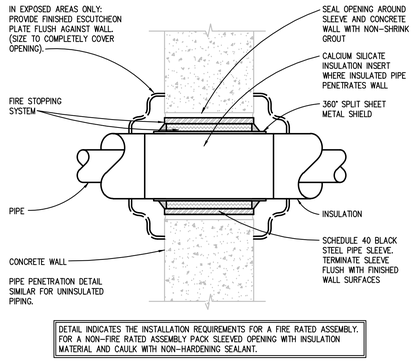
VERTICAL OR HORIZONTAL (NON FIRE RATED ASSEMBLY) DUCT PENETRATION DETAIL
NO SCALE



NEW FLOOR PIPE PENETRATION DETAIL
NO SCALE

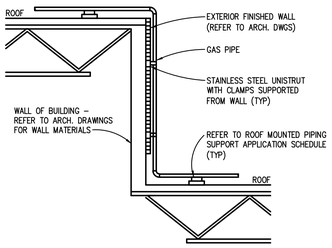


EXTERIOR BELOW GRADE WALL PIPE PENETRATION DETAIL
NO SCALE

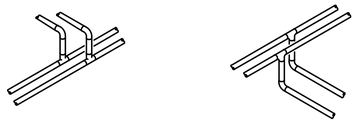


DETAIL INDICATES THE INSTALLATION REQUIREMENTS FOR A FIRE RATED ASSEMBLY. FOR A NON-FIRE RATED ASSEMBLY PACK SLEEVED OPENING WITH INSULATION MATERIAL AND CAULK WITH NON-HARDENING SEALANT.

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



GAS PIPE MOUNTING DETAIL
NO SCALE



BRANCH CONNECTION OFF TOP

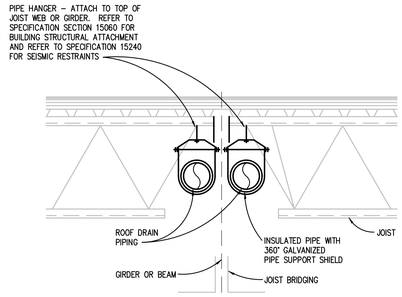
APPLIES TO THE FOLLOWING SYSTEMS:
DOMESTIC WATER
STEAM & CONDENSATE
LABORATORY GASES
LABORATORY VACUUM
COMPRESSED AIR
NATURAL GAS

BRANCH CONNECTION OFF BOTTOM

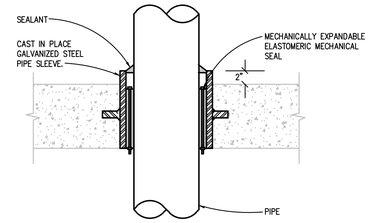
APPLIES TO THE FOLLOWING SYSTEMS:
HOT WATER HEATING
CHILLED WATER
CONDENSER WATER
ENERGY RECOVERY
PROCESS COOLING WATER

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

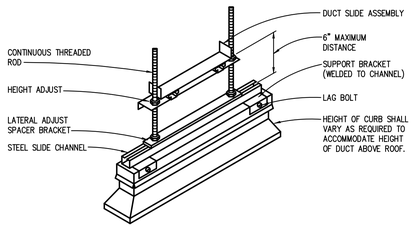
TYPICAL BRANCH TAKE-OFF CONNECTION PIPING DETAIL
NO SCALE



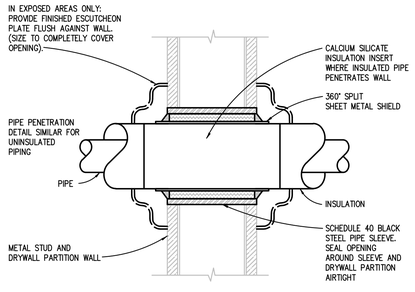
ROOF DRAIN PIPING DETAIL
NO SCALE



NEW SLAB ON GRADE FLOOR PIPE PENETRATION DETAIL
NO SCALE

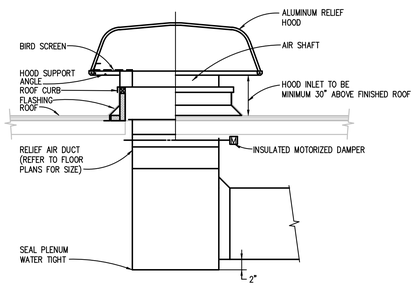


DUCT MOUNTING PEDESTAL DETAIL (ROOF MOUNTED DUCTWORK)
NO SCALE

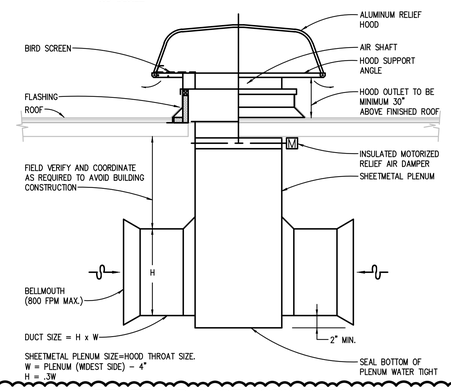


DETAIL INDICATES THE INSTALLATION REQUIREMENTS FOR A FIRE RATED ASSEMBLY. FOR A NON-FIRE RATED ASSEMBLY PACK SLEEVED OPENING WITH INSULATION MATERIAL AND CAULK WITH NON-HARDENING SEALANT.

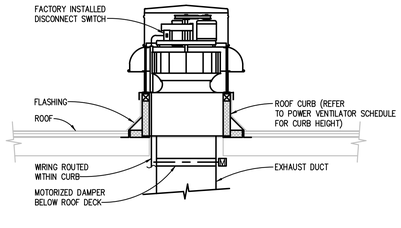
FIRE RATED AND NON-FIRE RATED METAL STUD AND DRYWALL PARTITION WALL PIPE PENETRATION DETAIL
NO SCALE



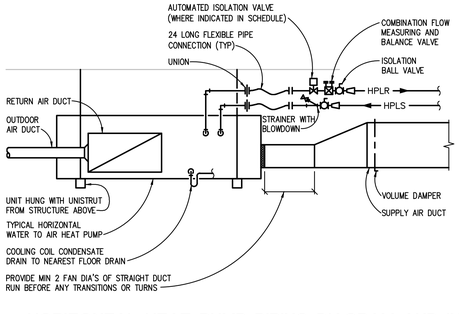
DUCTED INTAKE OR RELIEF HOOD INSTALLATION DETAIL
NO SCALE



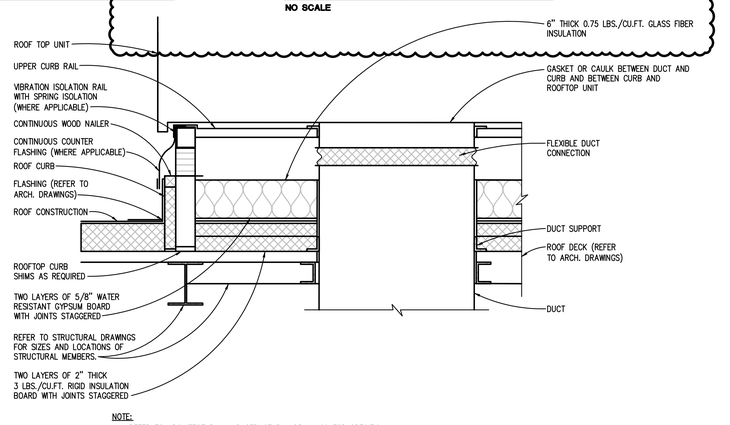
RELIEF AIR DUCTWORK DETAIL
NO SCALE



ROOF MOUNTED POWER VENTILATOR EXHAUST FAN DETAIL
NO SCALE



HORIZONTAL HEAT PUMP PIPING DIAGRAM AND INSTALLATION DETAIL
NO SCALE



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

ROOF TOP UNIT CURB SOUND ATTENUATION DETAIL
NO SCALE

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

MECHANICAL DETAILS

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

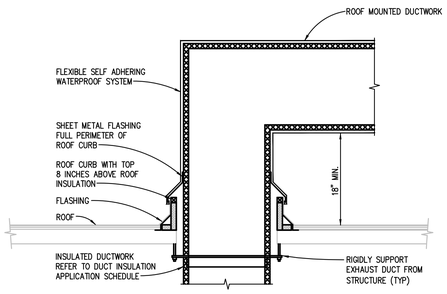
PROJECT NO.

22102

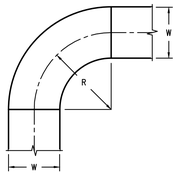
DRAWING NO.

M6.1

g:\2023\2023-0154-00\CAD\2023-0154-M6-DT.dwg, M6.1, 7/11/2024 4:00:28 PM, Suha A. Matti, None ,0.09448, Peter Basso Associates Inc.

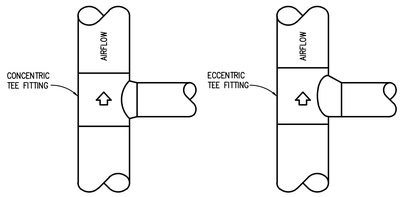


DUCT PENETRATION THROUGH ROOF DETAIL
NO SCALE

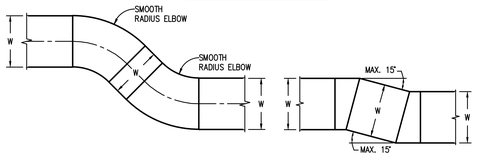


NOTES:
1. R/W = 1.0 FOR VELOCITIES <= 2,000 FPM UNLESS OTHERWISE INDICATED, R/W = 1.5 FOR VELOCITIES > 2,000 FPM UNLESS OTHERWISE INDICATED.
2. ALL CHANGES IN DIRECTION SHALL BE SMOOTH RADIUS ELBOW UNLESS OTHERWISE INDICATED.
3. THIS DETAIL APPLIES TO CHANGES IN DIRECTION FOR ALL ANGLES.

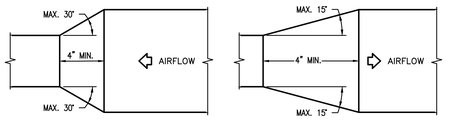
SMOOTH RADIUS ELBOW DETAIL



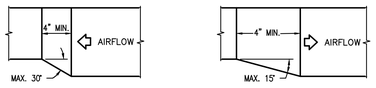
SUPPLY DUCT **RETURN OR EXHAUST DUCT**



SMOOTH RADIUS ELBOW OFFSET **ANGLED OFFSET**



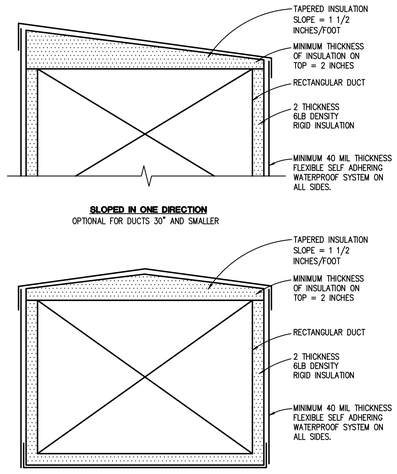
CONCENTRIC CONVERGING TRANSITION **CONCENTRIC DIVERGING TRANSITION**



ECCENTRIC CONVERGING TRANSITION **ECCENTRIC DIVERGING TRANSITION**

SPIRAL DUCT BRANCH TAKE-OFF DETAILS
NO SCALE (ROUND AND FLAT OVAL SIMILAR)

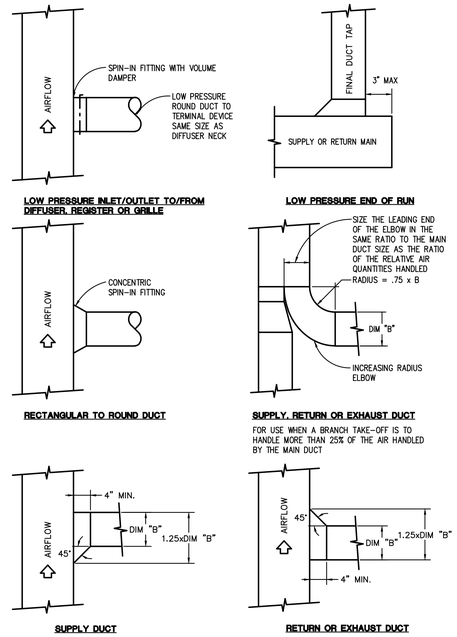
DUCT TRANSITION AND OFFSET DETAILS
NO SCALE



SLOPED IN ONE DIRECTION
OPTIONAL FOR DUCTS 30" AND SMALLER

SLOPED IN TWO DIRECTIONS

OUTDOOR DUCT INSULATION 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

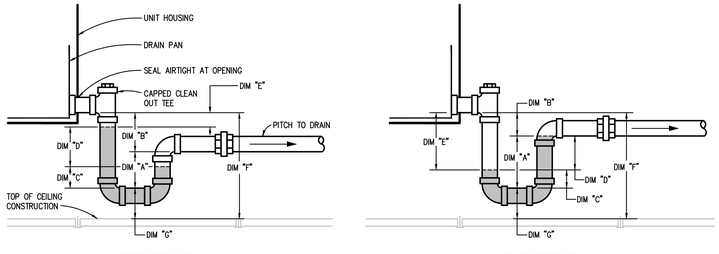
SUPPLY DUCT **RETURN OR EXHAUST DUCT**

RECTANGULAR DUCT BRANCH TAKE-OFF DETAILS
NO SCALE

TRAP DIMENSION TABLE

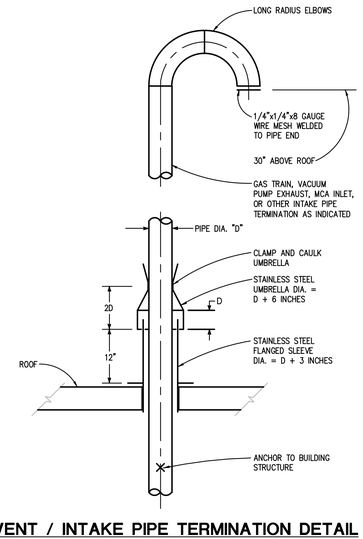
TYPE OF SYSTEM	S.P. AT DRAIN PAN (IN.) (NOTE A)	DIMENSION "A" (INCHES) MIN.	DIMENSION "B" (INCHES)	DIMENSION "C" (INCHES) (TRAP SEAL)	DIMENSION "D" (INCHES)	DIMENSION "E" (INCHES)	DIMENSION "F" (INCHES) DRAIN PIPE SIZE (INCHES)			
							1 1/2	2	2 1/2, 3	4
DRAW THROUGH	−2.1 TO −3	3.5	3.5	2	3	2	10.0	11.0	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

NOTES:
A. REFER TO EQUIPMENT SCHEDULES FOR (−) OR (+) STATIC PRESSURE AT DRAIN PAN.
A. BASE TRAP DIMENSIONS ON −____" S.P. FOR DRAW THROUGH UNITS AND +____" S.P. FOR BLOW THROUGH UNITS.
B. DRAIN PIPE SIZE SHALL BE SIZE OF DRAIN PAN OUTLET, MINIMUM 1".
C. DIMENSION "G" IS MIN: 3" FOR UP TO 1 1/2" DRAIN PIPE
4" FOR 2" DRAIN PIPE
5" FOR 2 1/2" OR 3" DRAIN PIPE
6" FOR 4" DRAIN PIPE



DRAW THROUGH **BLOW THROUGH**

CONDENSATE DRAIN PAN TRAP DETAIL (UNITARY UNITS ABOVE CEILING)
NO SCALE

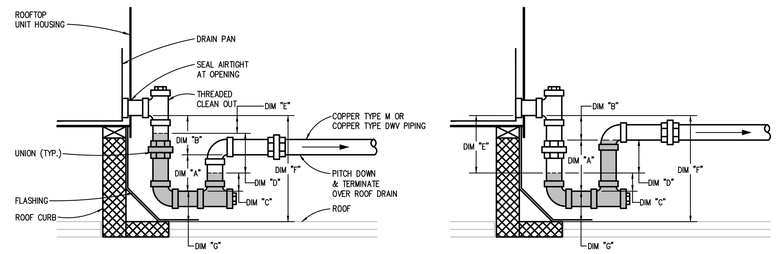


VENT / INTAKE PIPE TERMINATION DETAIL
NO SCALE

TRAP DIMENSION TABLE

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

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



DRAW THROUGH **BLOW THROUGH**

ROOFTOP AIR HANDLING/AIR CONDITIONING UNIT CONDENSATE DRAIN PAN TRAP DETAIL
NO SCALE

TMP ARCHITECTURE

TMP ARCHITECTURE INC
1191 WEST SQUARE LAKE ROAD - BOX 289
BLOOMFIELD HILLS - MICHIGAN - 48302
PH - 248.338.4561 FX - 248.338.0223
EM - INFO@TMP-ARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT

Peter Basso Associates Inc
CONSULTING ENGINEERS
5145 Livernois, Suite 100
Troy, Michigan 48098-3276
Tel: 248-879-5666
Fax: 248-879-0007
www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL
Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE
MECHANICAL DETAILS

ISSUE DATES

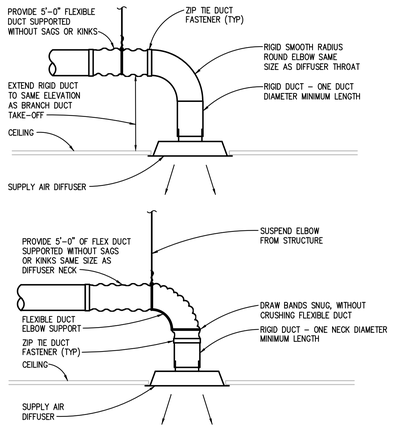
DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN JRB
CHECKED KLH
APPROVED SVM

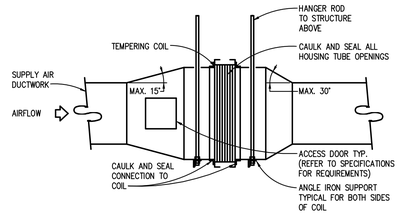
PROJECT NO.
22102

DRAWING NO.
M6.2

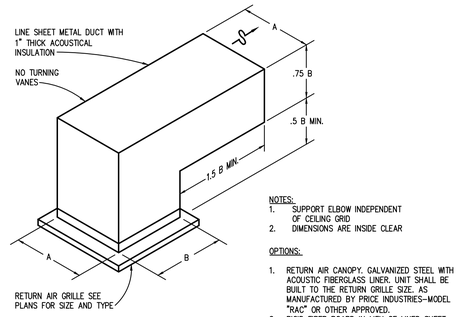
g:\2023\2023-0154-00\CAD\2023-0154-M6-01.dwg, M6.2, 6/17/2024 12:48:44 PM, Rachel L. Wilson, None ,0.09448, Peter Basso Associates Inc.



ROUND NECK SUPPLY AIR DIFFUSER DETAIL
NO SCALE



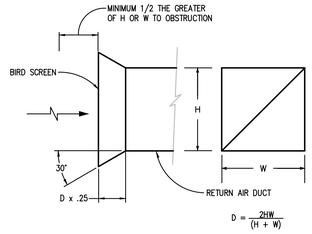
DUCT MOUNTED TEMPERING COIL INSTALLATION DETAIL
NO SCALE



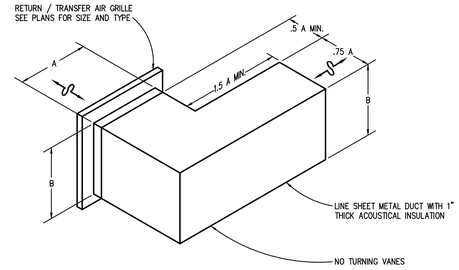
NOTES:
1. SUPPORT ELBOW INDEPENDENT OF CEILING GRID
2. DIMENSIONS ARE INSIDE CLEAR

OPTIONS:
1. RETURN AIR CANOPY. GALVANIZED STEEL WITH ACOUSTIC FIBERGLASS LINER. UNIT SHALL BE BUILT TO THE RETURN GRILLE SIZE. AS MANUFACTURED BY PRICE INDUSTRIES–MODEL "RAC" OR OTHER APPROVED.
2. RIGID FIBER BOARD IN LIEU OF LINED SHEET METAL DUCT.

CEILING GRILLE TO/FROM PLENUM



BELLMOUTH DETAIL
NO SCALE

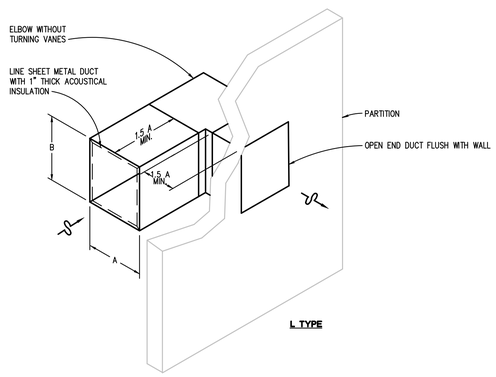


NOTE: DIMENSIONS ARE INSIDE CLEAR.

OPTION: RIGID FIBER BOARD IN LIEU OF LINED SHEET METAL DUCT.

PLENUM TO / FROM WALL GRILLE

PLENUM RETURN AIR GRILLE DETAILS
NO SCALE



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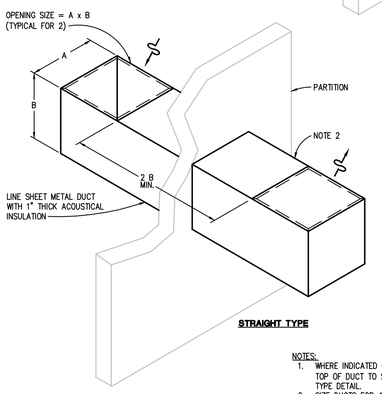
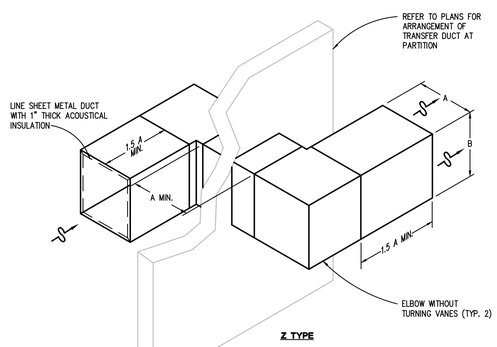


STRAIGHT TYPE

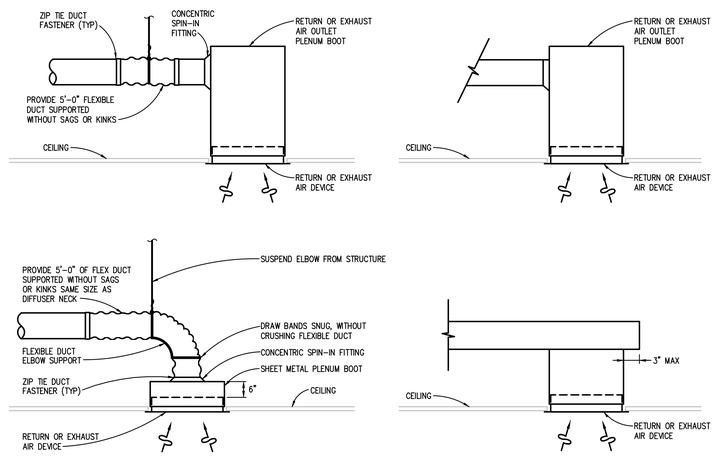


Z TYPE

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

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

AIR TRANSFER DUCT DETAILS
NO SCALE



RETURN OR EXHAUST AIR DEVICE INSTALLATION DETAIL
NO SCALE

NOTE: PAINT INTERIOR SURFACE OF PLENUM BOX FLAT BLACK.

TMP ARCHITECTURE

TMP ARCHITECTURE INC
1191 WEST SQUARE LAKE ROAD - BOX 289
BLOOMFIELD HILLS - MICHIGAN - 48302
PH - 248.338.4561 FX - 248.338.0223
EM - INFO@TMP-ARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT

Peter Basso Associates Inc
CONSULTING ENGINEERS
5145 Livernois, Suite 100
Troy, Michigan 48098-3276
Tel: 248-879-5666
Fax: 248-879-0007
www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

MECHANICAL DETAILS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

PROJECT NO.
22102

DRAWING NO.
M6.3

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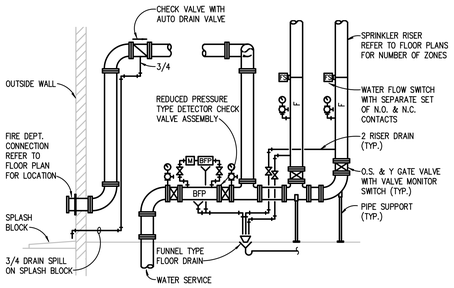
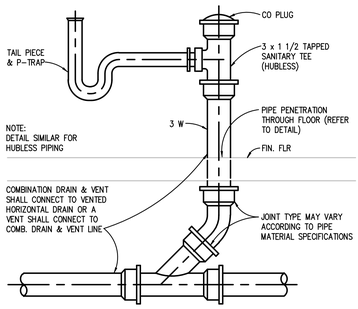
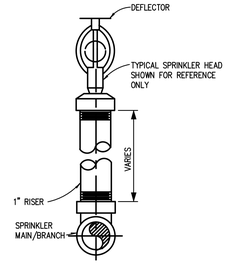


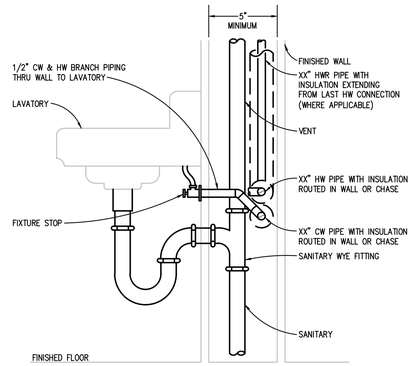
AUTOMATIC SPRINKLER RISER PIPING DIAGRAM
NO SCALE



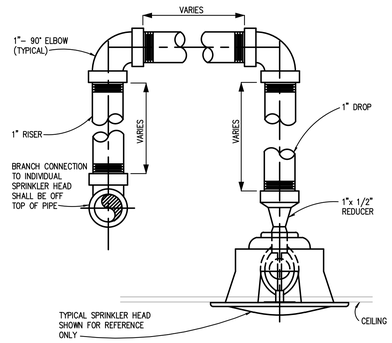
ISLAND SINK WASTE DETAIL FOR COMBINATION DRAIN & VENT SYSTEM
NO SCALE



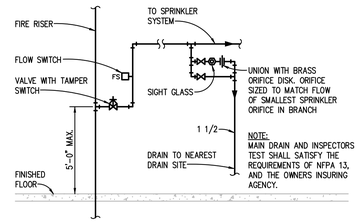
TYPICAL UPRIGHT SPRINKLER PIPING DETAIL
NO SCALE



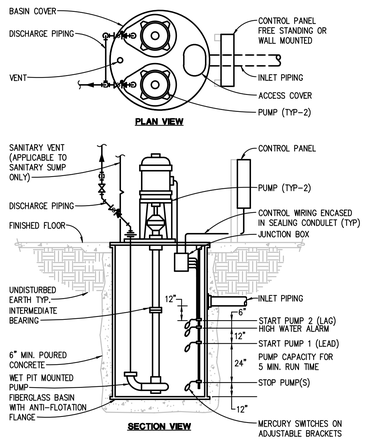
TYPICAL LAVATORY DETAIL
NO SCALE



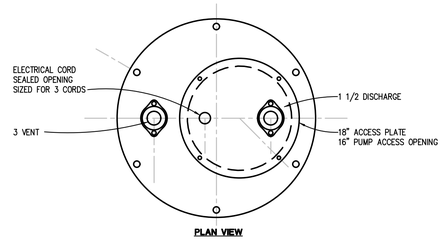
TYPICAL SPRINKLER PIPING DETAIL
NO SCALE

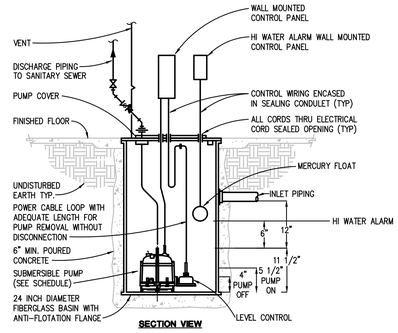


DRAIN/INSPECTORS TEST DETAIL
NO SCALE

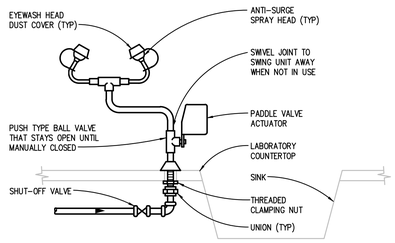


DUPLEX SUMP PUMP (SP-1) PIPING DIAGRAM
NO SCALE





SIMPLEX SUMP PUMP (SP-2) PIPING DIAGRAM
NO SCALE



EMERGENCY EYEWASH PIPING DIAGRAM
NO SCALE

GAS LOAD SCHEDULE

ITEM	TOTAL CFH
EMERGENCY GAS GENERATOR	2600
BOILER 1	2000
BOILER 2	2000
WATER HEATER 1	500
WATER HEATER 2	125
MAKE-UP AIR UNIT 1	600
MAKE-UP AIR UNIT 2	198
KITCHEN EQUIPMENT	
OVEN STEAMER	164
OVEN STEAMER	164
CONVECTION OVEN	100
RANGE	143

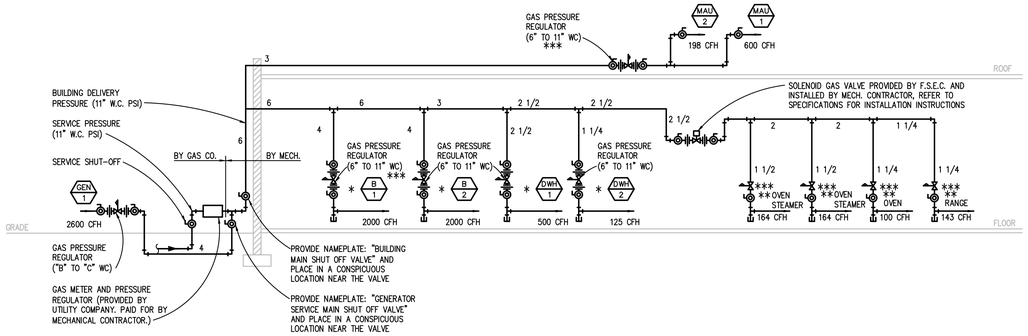
CONNECTED GAS LOAD = 8594 @ 11 IN W.C.

*GAS TRAIN PROVIDED BY EQUIPMENT MANUFACTURER – SEE SPECIFICATIONS

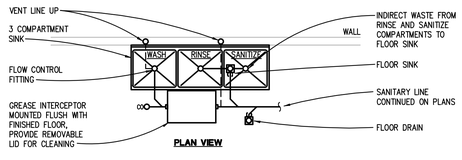
**GAS PRESSURE REGULATOR PROVIDED BY FOOD SERVICE MANUFACTURER

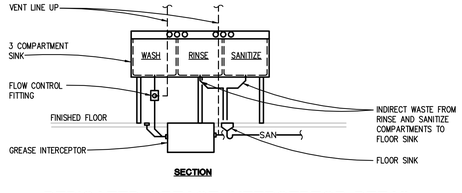
***THE GAS SERVICE COMPONENTS SHALL BE RATED IN ACCORDANCE WITH THE FOLLOWING CHART

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



NATURAL GAS PIPING DIAGRAM
NO SCALE





DEDICATED GREASE INTERCEPTOR DETAIL
NO SCALE

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

MECHANICAL DETAILS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

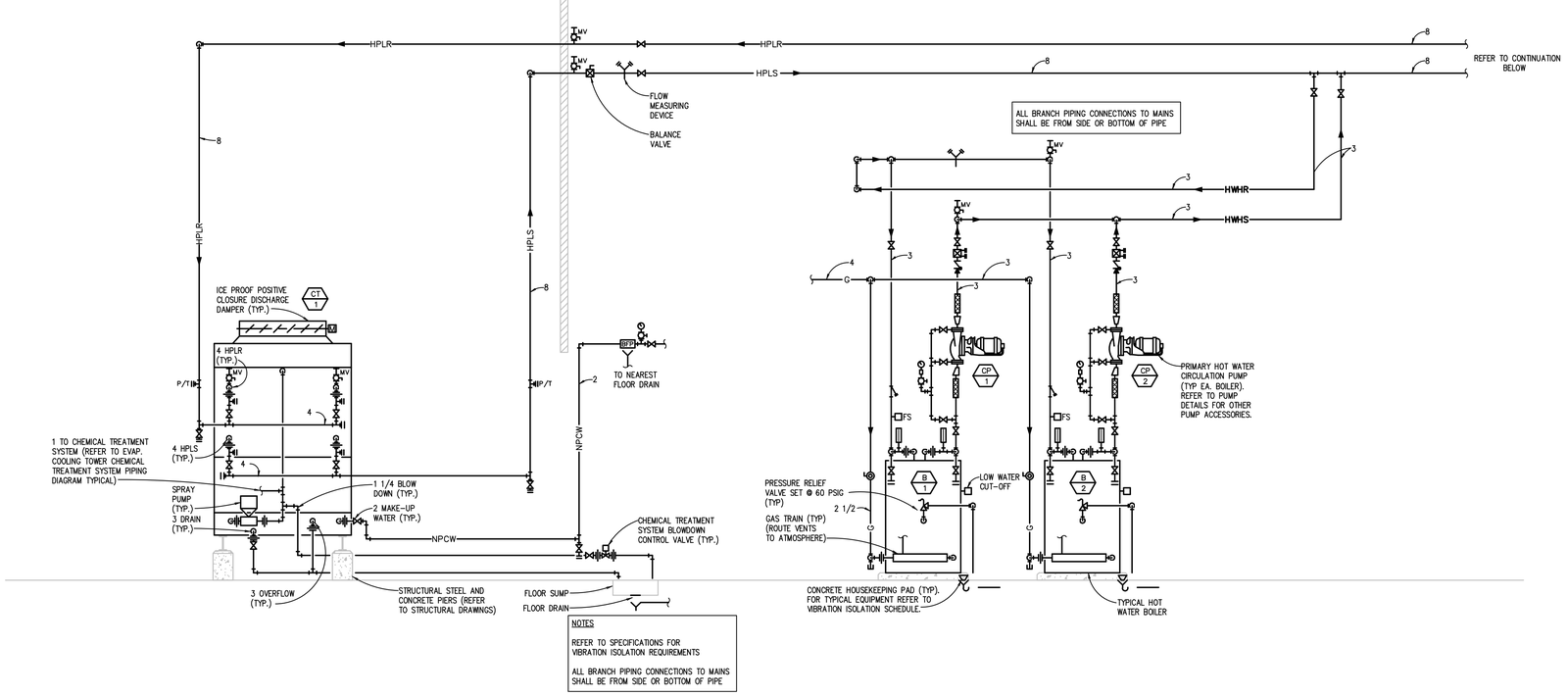
PROJECT NO.

22102

DRAWING NO.

M6.4

g:\2023\2023-0154-00\CAD\2023-0154-M6-01.dwg, M6.4, 6/17/2024 12:48:47 PM, Rachel L. Wilson, None ,0.09448, Peter Basso Associates Inc.



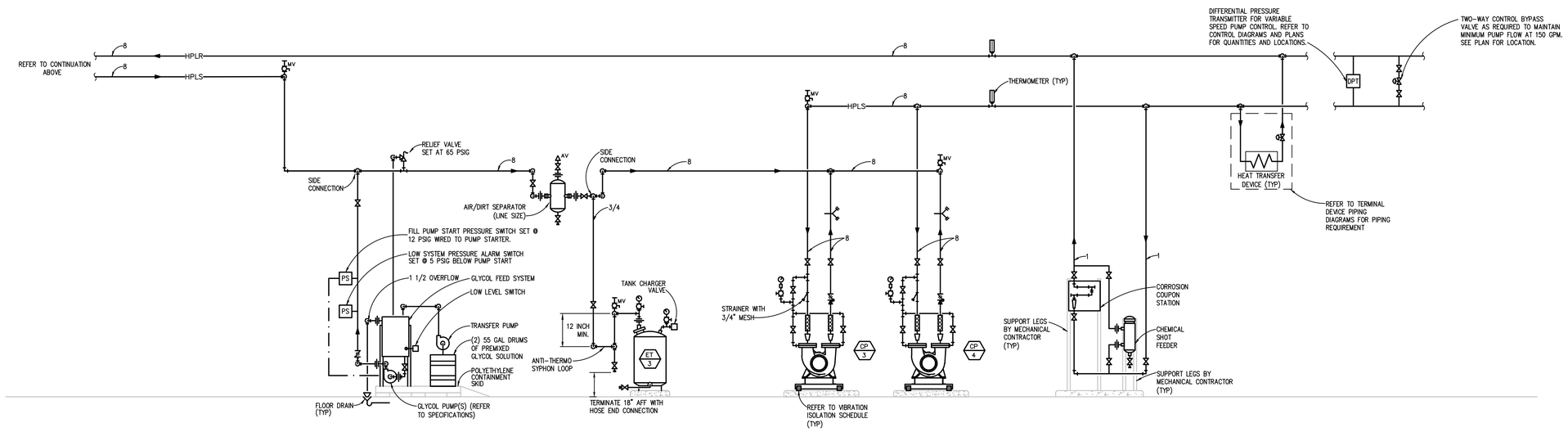
NOTES

REFER TO SPECIFICATIONS FOR VIBRATION ISOLATION REQUIREMENTS

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

HEAT PUMP LOOP SYSTEM PIPING DIAGRAM

NO SCALE



HEAT PUMP LOOP SYSTEM PIPING DIAGRAM (CONT.)

NO SCALE

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Troy School District
Troy, Michigan

DRAWING TITLE

MECHANICAL DETAILS

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DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

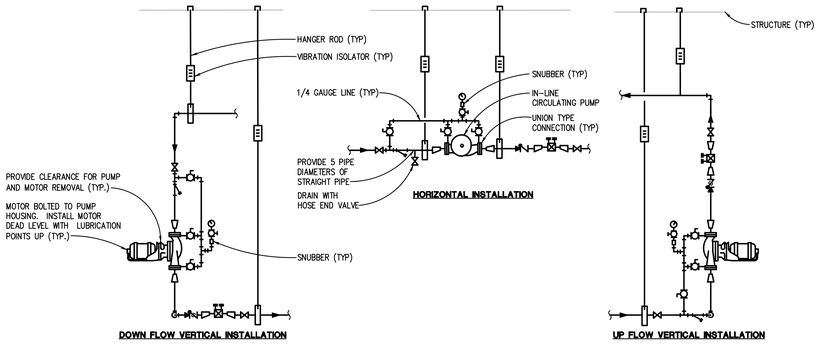
PROJECT NO.

22102

DRAWING NO.

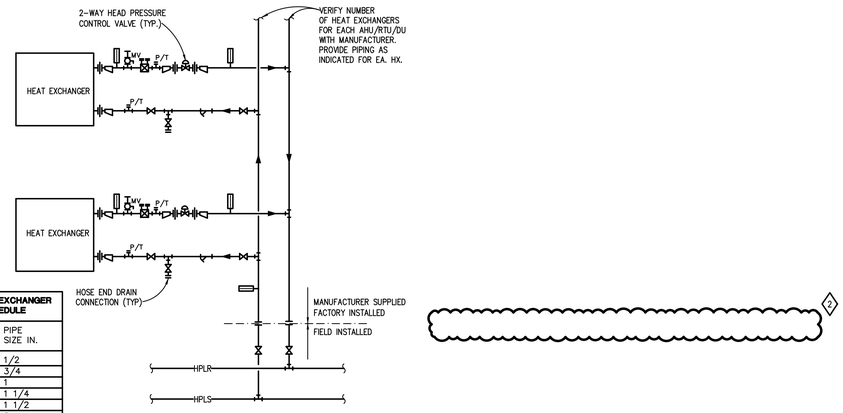
M6.5

g:\2023\2023-0154-00\CAD\2023-0154-M6-01.dwg, M6.5, 6/17/2024 12:48:49 PM, Rochel L. Wilson, None .0.09448, Peter Basso Associates Inc.



IN-LINE FLEXIBLE COUPLING (BELL AND GOSSETT SERIES 60) CIRCULATING PUMP PIPING DIAGRAM

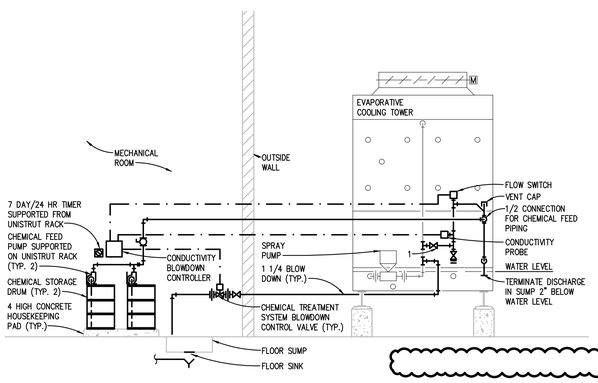
NO SCALE



MULTIPLE HEAT EXCHANGER PIPE SIZING SCHEDULE	
INDIVIDUAL COIL FLOW GPM	PIPE SIZE IN.
0 – 1.3	1/2
1.3 – 3.5	3/4
3.5 – 7.5	1
7.5 – 12.5	1 1/4
12.5 – 20	1 1/2
20 – 45	2
45 – 75	2 1/2
75 – 130	3
130 – 300	4

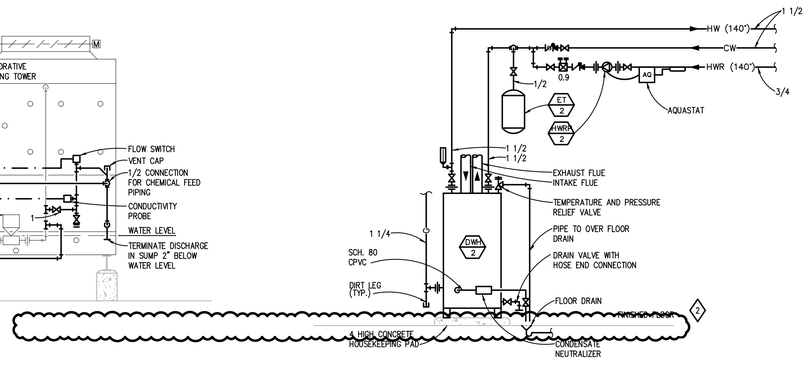
ERU HEAT PUMP PIPING DIAGRAM WITH 2-WAY VALVES

(ONLY FOR ERU-X)



CLOSED CIRCUIT EVAPORATIVE COOLER SUMP CHEMICAL TREATMENT SYSTEM

NO SCALE



GAS FIRED CONDENSING WATER HEATER PIPING DIAGRAM

NO SCALE

HOT WATER TEMPERATURE SET-UP

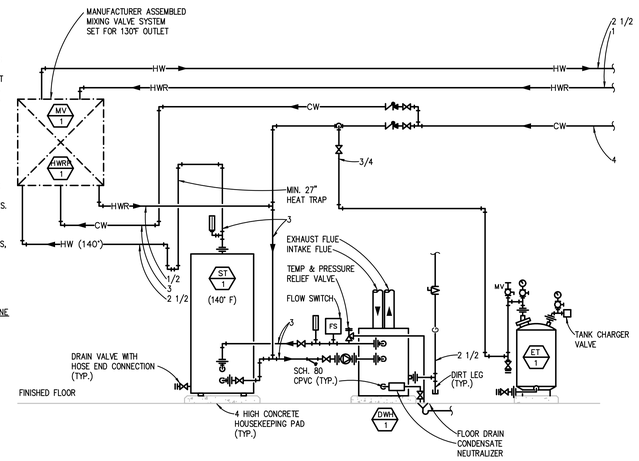
1. CREATE DEMAND GREATER THAN MIXING VALVE'S MINIMUM FLOW RATING USING HOSE CONNECTION ON HW LINE WITHIN ASSEMBLY. IF FLOW CAN NOT BE ACHIEVED THIS WAY, TURN ON FIXTURES WITHIN THE BUILDING.
2. ADJUST TEMPERATURE TO 130°F AND LET STABILIZE. RE-ADJUST AS NECESSARRY.
3. SET HIGH LIMIT ON AQUASTAT TO 132°F.

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

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

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

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



SINGLE CONDENSING WATER HEATER WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM

NO SCALE

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

MECHANICAL DETAILS

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	JRB
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M6.6

g:\2023\2023-0154-00\CAD\2023-0154-M6-DT.dwg, M6.6, 7/11/2024 4:00:30 PM, Suha A. Matti, None ,0.09448, Peter Basso Associates Inc.

ABOVEGROUND HVAC PIPING & VALVE APPLICATION SCHEDULE

PIPE SIZE (INCHES)	MATERIAL: SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (SCHED. 80)	CARBON STEEL (STD.)	COPPER TYPE DWV	CONNECTION: SOLDERED	BRAZED	WELDED	THREADED	FLANGED	GROOVED	PRESSURE SEAL	MECHANICALLY FORMED TEE	ISOLATION VALVES: BALL	GENERAL SERVICE BUTTERFLY	HI-PERF BUTTERFLY	GATE	KEYED NOTES
HEATING HOT WATER SUPPLY & RETURN - MIN. WORKING PRESS. & TEMP.: 125 PSIG AT 200 DEG F																				
UP TO 2				X							X					X				
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
HEAT PUMP LOOP - 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): FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	FIELD-APPLIED JACKET MATERIAL: ALUMINUM	STAINLESS STEEL	PVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
INDOOR PIPE SYSTEM AND SIZE (INCHES):														
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
HEAT PUMP LOOP SUPPLY & RETURN BELOW 60 DEG F.														
• NPS 1-1/4 AND SMALLER	1	1						X		X				A
• NPS 1-1/2 AND LARGER	1.5	1.5						X		X				A
OUTDOOR (ABOVEGROUND AND TUNNEL PIPE SYSTEM AND SIZE (INCHES):														
HEAT PUMP LOOP SUPPLY & RETURN	2.5	2.5						X			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 INDICATED ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED, CONTACTOR 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 ELASTOMETRIC THERMAL INSULATION.
C. STEAM AND CONDENSATE PIPING JACKET SHALL BE STUCCO EMBOSSED.
D. PIPING WITHIN ENERGY RECOVERY UNITS SHALL BE TYPE 304 STAINLESS STEEL, SMOOTH; 0.010 INCH THICK. SEAMS AND JOINTS CAULKED WITH CHEMICALLY RESISTANT SEALER.

MECHANICAL EQUIPMENT INSULATION APPLICATION SCHEDULE

	INSULATION MATIERAL & THICKNESS (INCHES): FLEXIBLE ELASTOMERIC	FIBERGLASS, LARGE DIAMETER PIPE & TANK	FIBERGLASS BOARD	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	FIELD APPLIED JACKET MATERIAL: ALUMINUM	PVC	KEYED NOTES
DOMESTIC COLD WATER PUMPS	1		1					X	X	A
DUAL-SERVICE HEATING AND COOLING PUMPS			2					X	X	
HEAT RECOVERY PUMPS			2					X	X	
DOMESTIC HOT, COLD, AND CHILLED WATER HYDROPNEUMATIC TANKS	1	1	1							A
HEATING WATER AIR SEPARATORS		2	2					X	X	
DOMESTIC COLD & CHILLED WATER STORAGE TANKS	1	1	1					X	X	A
INDOOR THERMAL STORAGE & CHILLED WATER BUFFER TANKS		3	3					X	X	
PIPING SYSTEM FILTER HOUSINGS		2	2					X	X	

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

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

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 HE UNIT DISCONNECT IS IN THE OFF POSITION.

9 <Designer Note: Standard mechanical specifications indicate that service receptacles are factory wired. If this note needs to change so that service receptacles are powered by individual 120v circuits, please coordinate this change with the mechanical specifications' sections.> SIZE ALL EQUIPMENT FEEDERS BASED ON THE LISTED MOP (MAXIMUM OVERCURRENT PROTECTION). REFER TO THE FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE ON THE ELECTRICAL STANDARD SCHEDULES SHEET.

DUCT SYSTEM APPLICATION SCHEDULE

AIR SYSTEMS	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	
EXHAUST AIR WITHOUT TERMINAL UNITS	X														-2	A	5	
KITCHEN EXHAUST (TYPE I HOOD)													X		N/A	N/A	N/A	C
KITCHEN EXHAUST (TYPE II HOOD)							X								-2	N/A	N/A	C
STERILIZER/WASHER EXHAUST							X								-2	N/A	N/A	C
LAUNDRY EXHAUST (DRYER VENT)	X														+/-2	A	5	A
LOCKER ROOM AND WET AREA EXHAUST						X	X								-2	A	5	
AIR TRANSFER DUCT				X											+2	A	5	
RELIEF AIR DOWNSTREAM OF FANS	X														+6	A	5	
OUTSIDE AIR AND MIXED AIR DUCT	X														-6	A	5	
OUTSIDE AIR, RELIEF AIR AND EXHAUST AIR PLENUMS ADJACENT TO EXTERIOR LOUVERS		X													+/-6	A	5	

GENERAL NOTES:
1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING 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.

DUCT SYSTEM INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES): FIBERGLASS BLANKET 0.75 LB/CU FT	FIBERGLASS BLANKET 1.0 LB/CU FT	FIBERGLASS BOARD 2.25 LB/CU FT	FIBERGLASS BOARD 6.0 LB/CU FT	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE RATED BLANKET	2-HOUR FIRE RATED BLANKET	ALUMINUM	FIELD APPLIED JACKET MATERIAL: SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	KEYED NOTES
DUCT SYSTEMS LOCATED INDOORS										
SUPPLY AIR, EXCEPT AS NOTED BELOW		1.5								A,E
RECTANGULAR SUPPLY AIR IN MECHANICAL ROOMS			1.5							
RECTANGULAR RETURN AIR IN MECHANICAL EQUIPMENT ROOM			1.5							
ROUND RETURN AIR IN MECHANICAL ROOMS		1.5								
OUTSIDE AIR AND MIXED AIR, EXCEPT AS NOTED BELOW		1.5								
RECTANGULAR OUTSIDE AIR AND MIXED AIR IN MECHANICAL ROOMS			1.5							
ROUND OUTSIDE AIR AND MIXED AIR IN MECHANICAL ROOMS		1.5								
EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, EXCEPT AS NOTED BELOW		1.5								
RECTANGULAR EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, IN MECHANICAL ROOMS			1.5							
ROUND & FLAT OVAL EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, IN MECHANICAL ROOMS		1.5								
LOCKER ROOM AND WET AREA EXHAUST BETWEEN EXHAUST GRILLE & CONNECTION TO GENERAL EXHAUST OR BETWEEN EXHAUST GRILLE AND PENETRATION OF BUILDING EXTERIOR		1.5								
KITCHEN EXHAUST (TYPE I HOOD)						X				B, C
KITCHEN EXHAUST AIR (TYPE II HOODS)		1.5								
STERILIZER/WASHER EXHAUST AIR		1.5								
DUCT SYSTEMS LOCATED OUTDOORS										
RECTANGULAR DUCTS AND AIR PLENUMS, ALL TYPES				2					X	
DUCT SYSTEMS LOCATED IN ATTICS, CRAWL SPACES, OR PARKING GARAGES HAVING NATURAL OR MECHANICAL VENTILATION										
RECTANGULAR DUCTS AND AIR PLENUMS, ALL TYPES	3			2						
ROUND & FLAT OVAL SUPPLY AIR	3									
ROUND & FLAT OVAL RETURN & EXHAUST AIR	3									

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 ONCE SELECTION IS INDICATED FOR A 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 UNITS 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 A CONDITIONED SPACE SERVED BY THE SAME AIR HANDLING SYSTEM IS NOT REQUIRED TO BE INSULATED.

ROOF MOUNTED PIPING SUPPORT APPLICATION SCHEDULE

PIPE TYPE AND SIZE	SUPPORT TYPE: LOW FIXED-HEIGHT SINGLE-BASE STAND	LOW ADJUSTABLE-HEIGHT SINGLE-BASE STAND	HIGH ADJUSTABLE-HEIGHT SINGLE-BASE STAND	LOW FIXED HEIGHT SINGLE-BASE ROLLER STAND	LOW ADJUSTABLE-HEIGHT SINGLE-BASE ROLLER STAND	HIGH MULTIPLE-BASE PIPE STAND	CUSTOM MULTIPLE BASE PIPE STAND	CURB-MOUNTING PIPE STAND	SHIELD TYPE: MSS TYPE 39 PROTECTION SADDLE	MSS TYPE 40 INSULATION PROTECTION SHIELD	THERMAL-HANGER SHIELD	KEYED NOTES
SINGLE PIPES												
NATURAL GAS NPS 5 AND SMALLER				X	X			X				
NATURAL GAS NPS 6 AND NPS 8					X			X				
CONDENSATE DRAIN PIPE ALL SIZES	X	X						X				
ALL PIPING NPS 18 AND LARGER							X	X			X	B, C, D
MULTIPLE PARALLEL PIPES												
NATURAL GAS NPS 5 AND SMALLER	X	X						X				
NATURAL GAS NPS 6 AND NPS 8	X	X						X				
CONDENSATE DRAIN PIPE ALL SIZES	X	X						X				
ALL PIPING NPS 18 AND LARGER								X			X	B, C, D

GENERAL NOTES:
1. 'X' INDICATES APPROVED HANGER OR SUPPORT ELEMENTS. IF MORE THAN ONE HANGER OR SUPPORT ELEMENT IS INDICATED, SELECTION FROM APPROVED ELEMENTS IS CONTRACTOR'S OPTION.
2. REFER TO HANGER AND SUPPORT SECTION FOR APPROVED MANUFACTURERS. CONTRACTOR'S OPINION.
3. SUPPORT ELEMENTS IN CONTRACT 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 ADJOINGING INSULATION.

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PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE
MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN KLH
CHECKED KLH
APPROVED SVM

PROJECT NO.
22102

DRAWING NO.
M7.1

7/11/2024 4:06:05 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

VIBRATION ISOLATOR APPLICATION SCHEDULE

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

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.

PLUMBING PIPING & VALVE APPLICATION SCHEDULE

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

GENERAL NOTES:
1. "X" INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. DISSIMILAR-METAL PIPING JOINTS: CONSTRUCT JOINTS USING DIELECTRIC FITTINGS COMPATIBLE WITH BOTH PIPING MATERIALS.

   a. NPS 2 AND SMALLER : USE DIELECTRIC NIPPLE/WATERWAY.
   b. NPS 2-1/2 AND LARGER: USE DIELECTRIC FLANGE KITS.

3. USE UNIONS OR FLANGES AT VALVE AND EQUIPMENT CONNECTIONS.
4. PLUMBING EQUIPMENT DRAINS, VENTS, SAFETY VALVE PIPING, BLOWDOWN PIPING AND THE LIKE SHALL BE SAME PIPING MATERIAL AS ASSOCIATED PIPING SYSTEM.
5. GROOVED END VALVES MAY BE USED WITH GROOVED PIPING.

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

ABOVEGROUND PLUMBING PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE

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

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

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

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

HORIZONTAL PIPING AND SUPPORT APPLICATION SCHEDULE

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

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

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

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PBA Project No.: 2023.0154

PROJECT TITLE
NEW SMITH MIDDLE SCHOOL
Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE
MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN KLH
CHECKED KLH
APPROVED SVM

PROJECT NO.
22102

DRAWING NO.
M7.2

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GRILLE, REGISTER, AND DIFFUSER SCHEDULE

UNIT IDENTIFICATION DES.	NO.	TYPE	FACE SIZE	NECKSIZE	FRAME TYPE	ACCESSORY	CONSTRUCTION	FINISH	MODEL NUMBER	KEYED NOTES
S	1	DIFFUSER	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	SCDA	1
S	2	DIFFUSER	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	SCDA	2
S	3	DIFFUSER	48x4.5	SEE PLANS	NOTE 2	-	STEEL	WHITE	SDS75	3
S	4	DIFFUSER	72x4.5	SEE PLANS	NOTE 2	-	STEEL	WHITE	SDS75	3
S	5	DIFFUSER	48x5	SEE PLANS	NOTE 2	-	STEEL	WHITE	SDS100	3
S	6	DIFFUSER	72x5	SEE PLANS	NOTE 2	-	STEEL	WHITE	SDS100	3
S	7	DIFFUSER	48x5	SEE PLANS	NOTE 2	-	STEEL	METALIC GREY	SDS100	3, 4
S	8	GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	STEEL	WHITE	510	
S	9	DIFFUSER	-	SEE PLANS	DUCT MOUNTED	-	STEEL	WHITE	RCD	
S	10	DIFFUSER	24x24	SEE PLANS	NOTE 2	-	ALUMINIUM	WHITE	ASCDA	1
S	11	GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	ALUMINIUM	WHITE	610	
S	12	DIFFUSER	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	VPD	
S	13	DIFFUSER	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	RAVD	
R	1	GRILLE	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	PDDR	
R	2	GRILLE	24x12	SEE PLANS	NOTE 2	-	STEEL	WHITE	PDDR	
R	3	GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	STEEL	WHITE	530	
R	4	GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	STEEL	NOTE 3	90	4
R	5	GRILLE	72x4	SEE PLANS	NOTE 2	SIGHT BAFFLE	STEEL	NOTE 3	SDR50	2, 4
T	1	GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	STEEL	WHITE	530	
E	1	GRILLE	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	PDDR	
E	2	GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	STEEL	WHITE	530	
E	3	GRILLE	NECK SIZE + 1"	SEE PLANS	DUCT MOUNTED	-	ALUMINIUM	WHITE	SDGER	
E	4	GRILLE	24x24	SEE PLANS	NOTE 2	-	ALUMINIUM	WHITE	PDDR	
E	5	GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	ALUMINIUM	WHITE	630	

GENERAL NOTES:
1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.
2. COORDINATE EXACT FRAME TYPE WITH ARCHITECTURAL TRADES.
3. COLOR SELECTION BY ARCHITECT.

KEYED NOTES:
1. HORIZONTAL THROW PATTERN
2. VERTICAL THROW PATTERN
3. 2 SLOT
4. PROVIDE COLOR SAMPLE TO ARCHITECT PRIOR TO ORDERING.

SEWAGE PUMP AND SUMP PUMP SCHEDULE

UNIT IDENTIFICATION				PUMP					BASIN					ELECTRICAL					
DES.	NO.	SYSTEM SERVED	SIMPLEX OR DUPLEX	QUANTITY	FLOW EACH GPM	W.P.D. FT. HEAD	HP EACH	RPM	CONSTRUCTION	DIAMETER INCHES	DEPTH INCHES	COVER TYPE	MODULATION / CONTROL TYPE	VOLTS	PHASE	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
SP	1	DRAIN TILE	DUPLEX	2	13.0	20.0	0.75	1750	FIBERGLASS	36	72	GRATE	AUTO	208	3	5		1607	
SP	2	ELEVATOR	SIMPLEX	1	50.0	20.0	0.75	1750	FIBERGLASS	36	36	GRATE	AUTO	120	1	5		1601	

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

FUEL FIRED DOMESTIC WATER HEATER SCHEDULE

UNIT IDENTIFICATION			FUEL								ELECTRICAL							
				MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN														
DES.	NO.	STORAGE CAPACITY GALLONS	TYPE	MIN	MAX	INPUT MBH	RECOVERY GPH	E.W.T. °F	L.W.T. °F	MODULATION / CONTROL TYPE	VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
DWH	1	650.0	NATURAL GAS	8	14	650	772	40	140	AUTO	120	1	0	0	5		AWH0650NPM	1
DWH	2	65.0	NATURAL GAS	8	14	125	145	40	140	AUTO	120	1	0	0	5		SWR125N	

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

KEYED NOTES:
1. PROVIDE 650 GALLON HOT WATER STORAGE TANK.

DOMESTIC HOT WATER SYSTEM EXPANSION TANK SCHEDULE

UNIT IDENTIFICATION					OPERATING PRESSURES AT EXPANSION TANK			SYSTEM OPERATING TEMPERATURES				DIMENSIONS			
DES.	NO.	SYSTEM SERVED	ESTIMATED TOTAL SYSTEM VOLUME GALLONS	TYPE	INITIAL PSIG	PRE-CHARGE PSIG	MAX (OPERATING) PSIG	MINIMUM °F	MAXIMUM °F	EXPANSION VOLUME GALLONS	MINIMUM TANK VOLUME GALLONS	DIAMETER INCHES	HEIGHT INCHES	MODEL NUMBER	KEYED NOTES
ET	1	DOMESTIC	80	BLADDER	40	40	125	40	240	80	60	24	55	WTA-448	
ET	2	KITCHEN	4	DIAPHRAGM	40	40	150	40	240	3.5	2.5	10	14	PTA-5	

GENERAL NOTES:
1. MODEL NUMBERS ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL PRE-CHARGE THE TANK TO THE VALUE INDICATED IN THE SCHEDULE. FOR TANKS THAT ARE SUPPLIED PRE-CHARGED BY THE MANUFACTURER, THE CONTRACTOR SHALL CONFIRM THE PRESSURE AND MAKE ADJUSTMENTS AS REQUIRED.

THERMOSTATIC MIXING VALVE SCHEDULE

UNIT IDENTIFICATION DES.	NO.	MINIMUM FLOW GPM	MAXIMUM FLOW GPM	PRESSURE DROP AT MAXIMUM FLOW PSIG	MODEL	KEYED NOTES
MV	1	1	226	50.00	6NB-LF	

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

DUCT SILENCER SCHEDULE

UNIT IDENTIFICATION DES.	NO.	SYSTEM TYPE	SYSTEM SERVED	AIRFLOW CFM	A.P.D. IN. W.G.	MAX P.D. IN. W.G.	VELOCITY AT DIL RATING FPM	DYNAMIC INSERTION LOSS (DIL) dB 63	125	250	500	1K	2K	4K	8K	TARGET NOISE CRITERIA	DIMENSIONS W INCHES	H INCHES	L INCHES	CONSTRUCTION TYPE	OUTER CASING TYPE	FILL MATERIAL	LINER	CASING MATERIAL	MODEL NUMBER	KEYED NOTES
DS	1R-A	RA	ERU-1	6150	0.24	0.35	769	8	16	30	50	55	50	37	24	25	48	24	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/1E	
DS	1R-B	RA	ERU-1	6150	0.24	0.35	769	8	16	30	50	55	50	37	24	25	48	24	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/1E	
DS	1S-A	SA	ERU-1	5125	0.27	0.35	941	7	13	24	43	46	41	30	20	25	28	28	72	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH72/2G	
DS	1S-B	SA	ERU-1	7175	0.31	0.35	879	10	16	26	45	47	47	33	22	25	42	28	72	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM72/2F	
DS	2R-A	RA	ERU-2	11300	0.21	0.35	1529	5	10	19	33	30	20	13	10	30	36	42	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/5C	
DS	2R-B	RA	RF-101	1940	0.13	0.35	998	6	12	22	36	37	26	17	12	25	20	16	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/4D	
DS	2R-C	RA	RF-102	2390	0.14	0.35	1024	6	11	21	40	47	38	25	19	25	24	16	72	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL72/1B	
DS	2S-A	SA	ERU-2	11300	0.23	0.35	1529	5	9	17	34	43	35	27	19	30	38	28	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/1E	
DS	2S-B	SA	FPB-101	1560	0.17	0.35	878	8	13	19	29	24	18	14	10	25	16	16	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/UD	
DS	2S-C	SA	FPB-102	2060	0.08	0.35	742	8	11	16	22	17	13	10	8	25	20	20	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/XC	
DS	2S-D	SA	FPB-103	1800	0.03	0.35	720	5	6	8	12	9	8	7	5	25	20	18	36	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM36/XB	
DS	3R	RA	ERU-3	2550	0.17	0.35	900	7	14	25	39	44	34	22	15	30	34	12	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/3E	
DS	3S	SA	ERU-3	2550	0.16	0.35	937	6	10	20	37	41	33	25	17	30	28	14	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/2F	
DS	4R	RA	ERU-4	11000	0.16	0.35	1269	6	10	19	36	45	35	26	18	40	48	26	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/1E	
DS	4S	SA	ERU-4	11000	0.22	0.35	1269	5	10	18	34	40	32	21	16	40	48	26	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/2D	
DS	5R	RA	ERU-5	2100	0.02	0.35	741	4	4	7	11	8	7	6	4	30	34	12	36	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM36/VA	
DS	5S	SA	ERU-5	2100	0.15	0.35	982	6	12	19	31	27	20	13	10	30	22	14	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/8D	
DS	6E	EA	ERU-6	1850	0.07	0.35	925	5	8	15	27	22	16	11	9	40	24	12	48	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM48/6C	
DS	6S	SA	ERU-6	1850	0.14	0.35	925	8	11	16	20	15	12	10	9	40	24	12	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/2C	
DS	7E	EA	ERU-7	6400	0.07	0.35	1067	4	7	13	24	19	13	10	8	40	48	18	48	RS	STANDARD	GLASS FIBER	NO	ALUMINUM	RM48/6B	
DS	7S-A	SA	ERU-7	3400	0.2	0.35	920	8	13	22	44	49	48	33	24	30	38	14	72	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM72/1E	
DS	7S-B	SA	ERU-7	3000	0.14	0.35	1029	7	10	17	26	22	16	12	10	40	30	14	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/9C	
DS	8R	RA	ERU-8	15000	0.17	0.35	1125	9	14	18	25	19	13	11	8	30	48	40	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/XD	
DS	8S-A	SA	ERU-8	5760	0.2	0.35	1595	8	13	25	46	47	41	29	20	30	32	38	84	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RHX84/2F	
DS	8S-B	SA	ERU-8	11470	0.25	0.35	1639	7	12	21	41	48	45	28	21	30	54	36	72	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RMX72/1D	
DS	9R	RA	ERU-9	15000	0.13	0.35	1164	7	10	17	25	20	14	11	9	30	72	28	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/9B	
DS	9S	SA	ERU-9	15000	0.27	0.35	1385	6	12	22	37	38	30	19	14	30	60	26	72	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM72/4D	
DS	10R	RA	ERU-10	15000	0.17	0.35	1125	9	14	18	25	19	13	11	8	30	56	30	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/XD	
DS	10S-A	SA	ERU-10	5760	0.2	0.35	1595	8	13	25	46	47	41	29	20	30	32	38	84	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RHX84/2F	
DS	10S-B	SA	ERU-10	11470	0.32	0.35	1496	8	13	23	41	44	41	28	20	30	58	36	72	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RMX72/2E	

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

PLUMBING CONNECTION SCHEDULE

UNIT IDENTIFICATION DES.	NO.	CW INCHES	HW INCHES	SAN INCHES	VENT INCHES	KEYED NOTES
EEW	1	-	-	-	-	2
EWC	1	1/2	-	1 1/2	1 1/2	
FD	1	-	-	3	-	
FD	2	-	-	4	-	
FS	2	-	-	3	-	
LAV	1	1/2	1/2	1 1/2	1 1/2	
SH	1	3/4	3/4	-	-	1
SK	1	3/4	3/4	1 1/2	1 1/2	
SS	1	3/4	3/4	3	-	
UR	1	3/4	-	2	1 1/2	
WC	1	1 1/2	-	4	2	

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

KEYED NOTES:
1. PROVIDE MIXING VALVE.
2. PROVIDE 1/2" TEMPERED WATER.

WATER SOURCE HEAT PUMP SCHEDULE

UNIT IDENTIFICATION			FAN			LOOP WATER			COOLING MODE (90 °F ENT. WATER TEMP.)						HEATING MODE (70 °F ENT. WATER TEMP.)					COMPRESSORS				ELECTRICAL							
									AIR		TOTAL CAPACITY MBH	SENS. CAPACITY MBH		MINIMUM E.E.R.	AIR		TOTAL CAPACITY MBH	THA MBH	MINIMUM C.O.P.												
DES.	NO.	NOMINAL SIZE (TONS)	AIRFLOW CFM	ESP IN. W.G.	HP	FLOW GPM	FLUID TYPE	MAX W.P.D. FT. HEAD	E.A.T. °F	L.A.T. °F			THR MBH		E.A.T. °F	L.A.T. °F				NO. OF COMP.	R.L.A. EA.	L.R.A. EA.	ARRANGEMENT	VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
HP	101	6	2000	0.5	1	18	PG30	16.55	80	57	67.3	48	83.7	14	55	85	61.8	47.7	4.4	1	8.5	66.1	HORIZONTAL	480	3	15.4	25	5	B	WGTH0721	1
HP	102	4	1400	0.5	1	12	PG30	7.25	80	59	46.1	31.9	56.9	14.5	55	81	40	31.3	4.6	1	6.4	41	HORIZONTAL	480	3	11.9	15	5	B	WGTH0491	1

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE DAIKIN UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.
4. INTERNAL STATIC PRESSURE VALUE SHALL INCLUDE WET COIL PRESSURE DROP. EXTERNAL PRESSURE INCLUDES DIRTY FILTER PRESSURE DROP AS SCHEDULED.

KEYED NOTES:
1. PROVIDE WITH 120V/1PH CONDENSATE PUMP.

PACKAGED BOOSTER PUMP SCHEDULE

UNIT IDENTIFICATION								PUMP			MOTOR				ELECTRICAL					
DES.	NO.	SYSTEM SERVED	LOCATION	TYPE	NUMBER OF PUMPS	DISCHARGE WATERFLOW GPM	PUMP INLET PRESSURE HEAD PSIG	DISCHARGE PRESSURE HEAD PSIG	PUMP MODEL NUMBER	OVERLOAD GPM	RPM EACH	HP EACH	CAPACITY CONTROL	MODULATION / CONTROL TYPE	VOLTS	PHASE	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
BP	1	DOMESTIC WATER	MECHANICAL A136	SUCTION	2	180	33.00	60.00	HVL2D3		3500	5.00		AUTO	460	3	5		HVL2D3	

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

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-16-2024	ADDENDUM #3
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN KLH
CHECKED KLH
APPROVED SVM

PROJECT NO.
22102

DRAWING NO.
M7.3

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ENERGY RECOVERY UNIT WITH INTEGRAL HEAT PUMP SCHEDULE (A)

UNIT IDENTIFICATION			SUPPLY FAN					MOTOR			EXHAUST FAN			MOTOR			HEAT EXCHANGER (SUMMER)										HEAT EXCHANGER (WINTER)									
																	SUPPLY SIDE					EXHAUST SIDE					SUPPLY SIDE					EXHAUST SIDE				
DES.	NO.	AREA/SYSTEM SERVED	CFM	MIN. OA CFM	ESP"	TSP"	CONROL TYPE	QUANTITY	BHP	HP	CFM	ESP"	TSP"	QUANTITY	BHP	HP	E.A.T. D.B. °F	E.A.T. W.B. °F	L.A.T. D.B. °F	L.A.T. W.B. °F	A.P.D. IN. WG.	E.A.T. D.B. °F	E.A.T. W.B. °F	L.A.T. D.B. °F	L.A.T. W.B. °F	A.P.D. IN. WG.	EFFIC. (%)	E.A.T. D.B. °F	E.A.T. W.B. °F	L.A.T. D.B. °F	L.A.T. W.B. °F	A.P.D. IN. WG.	E.A.T. D.B. °F	L.A.T. D.B. °F	L.A.T. W.B. °F	A.P.D. IN. WG.	EFFIC. (%)
ERU	1	GYMNASIUM	12300	7600	2.75	4.29	SZVAV	2	11.80	15.00	12300	1.25	2.78	2	8.40	10.00	91.0	74.0	76.4	63.7	0.53	72.0	86.6	71.0	0.53	77	-10.0	-10.9	52.9	43.8	0.53	72.0	9.1	8.9	0.53	77
ERU	2	CLASSROOMS	11300	6400	3.25	5.03	DAT-DSP VAV	2	13.00	15.00	11300	1.25	2.66	2	6.80	10.00	91.0	74.0	82.6	69.0	0.41	72.0	86.3	70.0	0.41	65	-10.0	-10.9	26.1	23.9	0.41	72.0	10.4	10.3	0.41	71
ERU	3	MEDIA CENTER	2550	1450	2.25	3.78	DAT-DSP VAV	1	2.20	3.00	2550	1.25	2.60	1	1.50	2.00	91.0	74.0	78.3	65.6	0.35	72.0	84.7	69.3	0.35	64	-10.0	-10.9	44.8	38.4	0.35	72.0	17.2	16.7	0.35	67
ERU	4	DINING COMMONS	11000	3900	3.25	4.99	SZVAV	2	12.60	15.00	11000	1.25	2.67	2	7.40	10.00	91.0	74.0	78.8	66.0	0.42	72.0	84.2	69.0	0.42	61	-10.0	-10.9	42.7	37.0	0.42	72.0	19.3	18.6	0.42	64
ERU	5	OFFICES	2100	800	2.25	3.76	DAT-DSP VAV	1	1.90	3.00	2100	1.25	2.53	1	1.20	1.50	91.0	74.0	78.6	65.7	0.28	72.0	86.0	70.0	0.28	71	-10.0	-10.9	43.3	37.3	0.28	72.0	11.7	11.6	0.28	73
ERU	6	KITCHEN	1850	1250	2.25	4.18	SZVAV	1	2.00	3.00	1850	1.25	2.69	1	1.10	2.00	91.0	74.0	79.6	67.0	0.44	72.0	84.3	68.8	0.44	58	-10.0	-10.9	39.0	33.8	0.44	72.0	18.8	18.7	0.44	64
ERU	7	LOCKER ROOMS	6400	6400	1.00	3.32	CAV-DAT	1	4.60	7.50	7040	1.25	2.88	1	4.60	7.50	91.0	74.0	76.9	64.3	0.63	72.0	86.1	63.6	0.63	73	-10.0	-10.9	51.0	42.4	0.63	72.0	11.0	10.9	0.63	74
ERU	8	CLASSROOMS	15000	8900	3.25	5.03	DAT-DSP VAV	2	16.80	20.00	15000	1.25	2.83	2	9.80	15.00	91.0	74.0	80.2	67.1	0.58	72.0	88.4	71.7	0.58	80	-10.0	-10.9	36.4	31.9	0.58	72.0	1.3	1.1	0.58	84
ERU	9	CLASSROOMS	15000	8900	3.25	5.03	DAT-DSP VAV	2	16.80	20.00	15000	1.25	2.58	2	9.80	15.00	91.0	74.0	79.3	66.1	0.33	72.0	89.4	72.9	0.33	80	-10.0	-10.9	40.5	35.4	0.33	72.0	-3.2	-4.0	0.33	84
ERU	10	CLASSROOMS	15000	8900	3.25	5.03	DAT-DSP VAV	2	16.80	20.00	15000	1.25	2.83	2	8.30	15.00	91.0	74.0	80.2	67.1	0.58	72.0	88.4	71.7	0.58	92	-10.0	-10.9	36.4	31.9	0.58	72.0	1.3	1.3	0.58	93

ENERGY RECOVERY UNIT WITH INTEGRAL HEAT PUMP SCHEDULE (B)

UNIT IDENTIFICATION		COOLING MODE												COOLING MODE			HEATING MODE									
		AIR				TOTAL	SENS.					HOT GAS REHEAT					AIR		TOTAL							
DES.	NO.	E.A.T. D.B. °F	E.A.T. W.B. °F	L.A.T. D.B.°F	L.A.T. W.B.°F	CAPACITY MBH	CAPACITY MBH	THR MBH	E.W.T. °F	L.W.T. °F	FLOW GPM	Y/N	MBH	MINIMUM E.E.R.	MAX W.P.D. FT. HEAD	CONTROL VALVE W.P.D. FT. HEAD	E.A.T. °F	L.A.T. °F	CAPACITY MBH	THA MBH	E.W.T. °F	L.W.T. °F	FLOW GPM	MINIMUM C.O.P.	MAX W.P.D. FT. HEAD	CONTROL VALVE W.P.D. FT HEAD
ERU	1	74.7	62.4	54.8	53.5	318	268.3	418.6	90	100	87.4	Y	176.9	14.8	4.2	11.5	63.8	96.4	434.2	372.6	70	61	87.4	5.9	4.2	11.5
ERU	2	78.0	65.4	55.3	54.4	377.2	280.9	457	90	100	95.4	N	-	15.7	7.1	11.5	52.5	89.6	454.2	411.3	70	61	95.4	6.5	7.1	11.5
ERU	3	75.6	63.3	52.8	51.6	86.4	63.7	92.9	90	100	19.4	N	-	15.3	2.1	11.5	58.7	92.7	94	83.6	70	61	19.4	6.1	2.1	11.5
ERU	4	74.4	62.3	55.1	54.0	263.8	232.8	330	90	100	68.9	Y	166.7	17.5	4.1	11.5	60.6	89.3	320.3	293.7	70	61	68.9	7.6	4.1	11.5
ERU	5	74.8	62.6	55.0	54.1	51.9	45.5	66.6	90	100	13.9	N	-	17.8	2.8	11.5	55.5	85.1	67.3	61.3	70	61	13.9	8.2	2.8	11.5
ERU	6	77.6	65.2	55.2	54.3	61.2	45.4	84.8	90	100	17.7	Y	29	16.1	6.5	11.5	47.1	88.9	83.7	73.8	70	61	17.7	6.8	6.5	11.5
ERU	7	76.9	64.3	54.9	53.8	199.9	154	277.3	90	100	57.9	N	-	15.6	4.7	11.5	40.8	81.9	285	252.4	70	61	57.9	7.2	4.7	11.5
ERU	8	76.9	64.4	55.4	54.5	446	353.9	555.2	90	100	115.9	N	-	15.6	6.8	11.5	23.5	58.7	572.5	538.5	70	60	115.9	8.2	6.8	11.5
ERU	9	76.3	63.7	55.1	54.2	446	348.9	555.2	90	100	115.9	N	-	15.6	6.8	11.5	23.5	58.7	572.5	538.5	70	60	115.9	8.2	6.8	11.5
ERU	10	76.9	64.4	55.4	54.5	423.8	343.9	555.2	90	100	115.9	N	-	15.6	6.8	11.5	23.5	58.7	572.5	538.5	70	60	115.9	8.2	6.8	11.5

ENERGY RECOVERY UNIT WITH INTEGRAL HEAT PUMP SCHEDULE (C)

UNIT IDENTIFICATION		PRE-FILTERS		RETURN FILTERS		ELECTRICAL						CURB				MAXIMUM UNIT DIMENSIONS				
												TYPE								
DES.	NO.	EFF. (%)	SP " TOTAL	EFF. (%)	SP " TOTAL	VOLTS	PHASE	MCA	MOP	SCCR KA	OPTIONS / ACCESSORIES	STANDARD	VIBRATION ISOLATION SPRING CURB	HEIGHT	UNIT WEIGHT (LBS.)	LENGTH INCHES	WIDTH INCHES	HEIGHT INCHES	MODEL NUMBER	KEYED NOTES
ERU	1	85	0.7	85	0.70	480	3	84	90	10	B	NO	YES	24	20750	282.0	127.0	98.0	ERU-SS-WH-12300-HP-460	
ERU	2	85	0.7	85	0.70	480	3	89	110	10	B	NO	YES	24	16700	259.0	117.0	98.0	ERU-SS-WH-11300-HP-460	
ERU	3	85	0.7	85	0.70	480	3	22	30	5	B	NO	YES	24	10800	251.0	83.0	72.0	ERU-SS-WH-2600-HP-460	
ERU	4	85	0.7	85	0.70	480	3	74	90	10	B	NO	YES	24	18000	256.0	116.0	92.0	ERU-SS-WH-11000-HP-460	
ERU	5	85	0.7	85	0.70	480	3	19	25	5	B	NO	YES	24	8700	186.0	83.0	72.0	ERU-SS-WH-2100-HP-460	
ERU	6	85	0.7	85	0.70	480	3	20	25	5	B	NO	YES	24	10000	251.0	83.0	54.0	ERU-SS-WH-1800-HP-460	
ERU	7	85	0.7	85	0.70	480	3	51	60	5	B	NO	YES	24	14900	263.0	106.0	86.0	ERU-SS-WH-6400-HP-460	
ERU	8	85	0.7	85	0.70	480	3	108	125	10	B	NO	YES	24	19300	263.0	127.0	110.0	ERU-SS-WH-15000-HP-460	
ERU	9	85	0.7	85	0.70	480	3	108	125	22	B	NO	YES	24	19750	266.0	127.0	110.0	ERU-SS-WH-15000-HP-460	
ERU	10	85	0.7	85	0.70	480	3	108	125	22	B	NO	YES	24	19300	263.0	127.0	110.0	ERU-SS-WH-15000-HP-460	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE INNOVENT UNLESS OTHERWISE NOTED
3. DESIGN MINIMUM OUTSIDE AIRFLOW CFM (VENTILATION) LISTED IS BASED ON THE ESTIMATED MAXIMUM OCCUPANT LOAD. REFER TO TEMPERATURE CONTROL DRAWINGS FOR OUTSIDE AIR CONTROL SEQUENCE.
4. MERV DESIGNATES THE "MINIMUM EFFICIENCY REPORTING VALUE" AS EVALUATED UNDER ASHRAE STANDARD 52.2 1999.
5. AIR HANDLING UNIT TOTAL STATIC PRESSURE FOR CONSTANT AIR VOLUME SYSTEMS IS BASED ON THE AVERAGE/MIDLIFE FILTER AIR PRESSURE DROP UNLESS NOTED OTHERWISE.

KEYED NOTES:
1. PROVIDE SINGLE POINT ELECTRICAL CONNECTION WITH MAIN DISCONNECT.

ELECTRIC PROPELLER FAN UNIT HEATER SCHEDULE

UNIT IDENTIFICATION			FAN				ELECTRICAL							
DES.	NO.	CAPACITY MBH	CFM	HEATING ELEMENT KW	FINAL AIR TEMPERATURE °F	MODULATION / CONTROL TYPE	VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
EUH	101	11.2	400	3.3	26	AUTO	480	3	4.0	15	5	A	P3PUH03CA1	
EUH	102	17	400	5	40	AUTO	480	3	6.1	15	5	A	P3PUH05CA1	
EUH	103	11.2	400	3.3	26	AUTO	480	3	4.0	15	5	A	P3PUH03CA1	
EUH	104	11.2	400	3.3	26	AUTO	480	3	4.0	15	5	A	P3PUH03CA1	
EUH	201	17	400	5	40	AUTO	480	3	6.1	15	5	A	P3PUH05CA1	
EUH	202	11.2	400	3.3	26	AUTO	480	3	4.0	15	5	A	P3PUH03CA1	

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

ELECTRIC CENTRIFUGAL FAN CABINET UNIT HEATER SCHEDULE

UNIT IDENTIFICATION			AIR			FAN		HEATING ELEMENT	DIMENSIONS			RECESS DEPTH INCHES	FILTER			ELECTRICAL							
DES.	NO.	CAPACITY MBH	AIRFLOW CFM	E.D.B. °F	L.D.B. °F	HP	RPM	TOTAL KW	LENGTH INCHES	HEIGHT INCHES	DEPTH INCHES		TYPE	AREA SQ. FT.	MODULATION / CONTROL TYPE	VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
ECUH	101	27.3	500	60	111	0	0	8	46	26	10	4	THROWAWAY	-	AUTO	480	3	11.7	20	5	A	6346D084833	
ECUH	102	20.5	500	60	98	0	0	6	46	26	10	4	THROWAWAY	-	AUTO	480	3	8.1	15	5	A	6346D064833	
ECUH	103	34.1	500	60	123	0	0	10	46	26	10	4	THROWAWAY	-	AUTO	480	3	15.4	20	5	A	6346D104833	
ECUH	104	34.1	500	60	123	0	0	10	46	26	10	4	THROWAWAY	-	AUTO	480	3	15.4	20	5	A	6346D104833	
ECUH	105	27.3	500	60	111	0	0	8	46	26	10	4	THROWAWAY	-	AUTO	480	3	11.7	20	5	A	6346D084833	
ECUH	106	13.6	250	60	110	0	0	4	33	26	10	4	THROWAWAY	-	AUTO	480	3	6.0	15	5	A	6333D044833	
ECUH	107	13.6	250	60	110	0	0	4	33	26	10	4	THROWAWAY	-	AUTO	480	3	6.0	15	5	A	6333D044833	
ECUH	108	13.6	250	60	110	0	0	4	33	26	10	4	THROWAWAY	-	AUTO	480	3	6.0	15	5	A	6333D044833	

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

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-23-2204	ADDENDUM #4
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN KLH
CHECKED KLH
APPROVED SVM

PROJECT NO.
22102

DRAWING NO.
M7.4

7/22/2024 10:14:38 AM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

CONDENSING BOILER SCHEDULE

UNIT IDENTIFICATION			FUEL				NET OUTPUT MBH (160/80 °F RWT)	BOILER PRESSURE RATING PSIG	RELIEF VALVE PRESSURE PSIG	NUMBER OF CONTROL STAGES	FLUID						DIMENSIONS			ELECTRICAL							
				MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN																							
DES.	NO.	SYSTEM SERVED	TYPE	MIN	MAX	INPUT MBH					E.W.T. °F	L.W.T. °F	FLOW GPM	FLUID TYPE	W.P.D. FT	MODULATION / CONTROL TYPE	WIDTH INCHES	LENGTH INCHES	HEIGHT INCHES	VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
B	1	HPL SYSTEM	NATURAL GAS	3.5	14	2000	1920	160	60.00	10:1	60	100	100	PG30	1.5	AUTO	35	77	80	208	1	10	20	5	A	SL-2000	
B	2	HPL SYSTEM	NATURAL GAS	3.5	14	2000	1920	160	60.00	10:1	60	100	100	PG30	1.5	AUTO	35	77	80	208	1	10	20	5	A	SL-2000	

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

KEYED NOTES:
1. BOILERS ARE SIZED AT 1/3 OF THE ANTICIPATED BUILDING LOAD.
2. BOILERS ARE SIZED AT 2/3 OF THE ANTICIPATED BUILDING LOAD.

PUMP SCHEDULE

UNIT IDENTIFICATION												MOTOR				ELECTRICAL					
DES.	NO.	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 %	BHP	HP	RPM	MODULATION / CONTROL TYPE	VOLTS	PHASE	SCCR KA (NOTE 4)	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
CP	1	B-1	MECHANICAL A136	INLINE	CLOSE	100	PG30	40	20	NON-OVERLOADING	67	0.79	1	1725	AUTO	480	3	22	---	e-90 2AAB	
CP	2	B-2	MECHANICAL A136	INLINE	CLOSE	100	PG30	40	20	NON-OVERLOADING	67	0.79	1	1725	AUTO	480	3	22	---	e-90 2AAB	
CP	3	HPL SYSTEM	MECHANICAL A136	BASE MOUNTED	FLEXIBLE	740	PG30	40	80	NON-OVERLOADING	80	19.2	25	1732	VFC	480	3	22	---	VSX-VSC 4x6x105.A	
CP	4	HPL SYSTEM	MECHANICAL A136	BASE MOUNTED	FLEXIBLE	740	PG30	40	80	NON-OVERLOADING	80	19.2	25	1732	VFC	480	3	22	---	VSX-VSC 4x6x105.A	
HWRP	1	DOMESTIC	MECHANICAL A136	INLINE	CLOSE	10	WATER	40	14	NON-OVERLOADING	0	0	0.17	33000	AQUASTAT	120	1	5		PL-36B	
HWRP	2	DOMESTIC	MECHANICAL A136	INLINE	CLOSE	1	WATER	40	8	NON-OVERLOADING	0	0	0.17	3300	AQUASTAT	120	1	5		PL-36B	

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.

DIRECT FIRED MAKE-UP AIR UNIT SCHEDULE

UNIT IDENTIFICATION			SUPPLY FAN							COOLING SECTION-DX							HEATING SECTION - GAS FIRED (NATURAL GAS)						MAXIMUM UNIT DIMENSIONS			CURB				ELECTRICAL											
										COIL ENTERING AIR		COIL LEAVING AIR		NET UNIT CAPACITY			AIR TEMP.		CAPACITY (MBH)		MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN					TYPE						UNIT		FAN		CONDENSER					
DES.	NO.	AREA SERVED	AIRFLOW CFM	MINIMUM OUTSIDE AIR FLOW CFM	E.S.P. IN. W.G.	T.S.P. IN. W.G.	FAN SPEED RPM	BHP	HP	E.D.B. °F	E.W.B. °F	L.D.B. °F	L.W.B. °F	TOTAL MBH	SENSIBLE MBH	MINIMUM NUMBER OF CIRCUUITS	E.A.T. °F	L.A.T. °F	INPUT	OUTPUT	MIN	MAX	LENGTH INCHES	HEIGHT INCHES	WIDTH INCHES	STANDARD	VIBRATION ISOLATION SPRING CURB	HEIGHT	MAXIMUM UNIT OPERATING WEIGHT LBS.	VOLTS	PHASE	MCA	MOP	MCA	MOP	MCA	MOP	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
MAU	1	C103 LIFE SKILLS	5150	5150	0.50	1.65	1981	2.51	3	91.0	74.0	74.0	66.9	140.2	96.3	1	-10	77	600	486	7	14	272	45	87	NO	YES	24	6700	480	3	26.9	35	-	-	-	-	5	B	IGX-P116-H22-MF-10-O	
MAU	2	B128 KITCHEN	2250	2250	0.50	1.23	1101	0.69	1	88.0	72.0	74.8	66.5	43.7	13.2	1	-10	70	197.9	182	7	14	202	75	50	NO	YES	24	2500	208	3	-	-	4.8	15	21.4	30	5	A	A2-D.250-20D-MPU	BASED ON CAPTIVEAIRE

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

ELECTRIC COIL SCHEDULE

UNIT IDENTIFICATION				DUCT SIZE (IN.)		HEATING ELEMENT KW	FINAL AIR TEMPERATURE °F		ELECTRICAL						
DES.	NO.	CAPACITY MBH	AIRFLOW CFM	WIDTH	HEIGHT			MODULATION / CONTROL TYPE	VOLTS	PHASE	FLA	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
EC	101	64.8	3100	30	14	20.5	90	SCR	480	3	24.7	5	B	DF C100H	
EC	102	3.4	150	8	8	1.0	91	SCR	480	3	1.2	5	B	DF C100H	
EC	103	3.4	150	8	8	1.0	91	SCR	480	3	1.2	5	B	DF C100H	
EC	104	61.4	3000	30	14	19.0	90	SCR	480	3	22.9	5	B	DF C100H	
EC	105	5.1	300	12	8	2.0	91	SCR	480	3	2.4	5	B	DF C100H	
EC	106	20.5	150	12	12	7.0	91	SCR	480	3	8.4	5	B	DF C100H	
EC	107	3.4	150	8	8	1.0	91	SCR	480	3	1.2	5	B	DF C100H	
EC	108	3.4	150	8	8	1.0	91	SCR	480	3	1.2	5	B	DF C100H	

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

HVAC SYSTEM EXPANSION TANK SCHEDULE

UNIT IDENTIFICATION						SYSTEM FILL VALVE OR GLYCOL PUMP PRESSURE SETTING PSIG	OPERATING PRESSURES AT EXPANSION TANK		SYSTEM OPERATING TEMPERATURES				DIMENSIONS			
DES.	NO.	SYSTEM SERVED	ESTIMATED TOTAL SYSTEM VOLUME GALLON	TYPE	FLUID TYPE		PRE-CHARGE PSIG	MAX (OPERATING) PSIG	MINIMUM °F	MAXIMUM °F	EXPANSION VOLUME GALLONS	ACCPETANCE FACTOR	MINIMUM TANK VOLUME GALLONS	DIAMETER INCHES	HEIGHT INCHES	MODEL NUMBER	KEYED NOTES
ET	3	HPL SYSTEM	6000	BLADDER	PG30	20	24	50	40	100	120	0.4	295	36	88	B1200	

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

CLOSED CIRCUIT COOLING TOWER SCHEDULE

UNIT IDENTIFICATION			AIR		FANS		CONDENSER WATER					SPRAY PUMPS		DIMENSIONS				ELECTRICAL - FAN			SPRAY PUMP MODULATION / CONTROL TYPE	ELECTRICAL - SPRAY PUMP					
DES.	NO.	TYPE	AIRFLOW CFM	E.W.B. °F	QUANTITY	HP EACH	FLUID	FLOW GPM	E.W.T. °F	L.W.T. °F	MAX W.P.D. FT. HD.	QUANTITY	HP EACH	WIDTH INCHES	HEIGHT	DEPTH INCHES	FAN MODULATION / CONTROL TYPE	VOLTS	PHASE	OPTIONS / ACCESSORIES		VOLTS	PHASE	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
CT	1	COUNTERFLOW	93600	78	2	15.00	PG30	740	100	90	20.1	1	5	102	180	216	VFC	480	3	---	AUTO	480	3	22	---	ATWB-903J18	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE EVAPCO UNLESS OTHERWISE NOTED.
3. UNIT PROVIDED (2) 6 KW IMMERSION HEATERS, 480V, 3 PHASE.
4. UNIT PROVIDED WITH (2) 120V FAN MOTOR SPACE HEATERS.
5. SHIPPING WEIGHT=17,440 LBS, OPERATING WEIGHT=25,610 LBS, HEAVIEST SECTION=12,690 LBS.

GRAVITY RELIEF HOOD SCHEDULE

UNIT IDENTIFICATION							HOOD SIZE						
DES.	NO.	SYSTEM SERVED	CFM	THROAT SIZE INCHES	THROAT VELOCITY FPM	STATIC PRESSURE DROP IN. W.G.	WIDTH INCHES	LENGTH INCHES	HEIGHT INCHES	CURB HEIGHT INCHES	HOOD CONSTRUCTION	MODEL NUMBER	KEYED NOTES
GRH	1	HP-101	2000	24x24	500	0.08	38	39	19	18	ALUMINIUM	FGR-24X24	
GRH	2	HP-102	1400	18x18	660	0.10	32	39	19	18	ALUMINUM	FGR-18X18	

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

INTAKE HOOD SCHEDULE

UNIT IDENTIFICATION							HOOD SIZE						
DES.	NO.	SYSTEM SERVED	CFM	THROAT SIZE INCHES	HOOD INTAKE VELOCITY FPM	THROAT VELOCITY FPM	STATIC PRESSURE DROP IN. W.G.	WIDTH INCHES	LENGTH INCHES	HEIGHT INCHES	CURB HEIGHT INCHES	HOOD CONSTRUCTION	MODEL NUMBER	KEYED NOTES
IH	1	HP-101	2000	16x36	250	500	0.06	40	51	16	18	ALUMINIUM	FGI-16X36	
IH	2	HP-102	1400	16x24	260	525	0.09	36	39	16	18	ALUMINIUM	FGI-16X24	
IH	3	EF-123	1300	18x18	290	600	0.05	32	39	16	18	ALUMINIUM	FGI-18X18	

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

FAN POWERED AIR TERMINAL UNIT WITH ELECTRIC COIL SCHEDULE

UNIT IDENTIFICATION		PRIMARY INLET AIRFLOW		FAN			DUCT CONNECTIONS			ELECTRIC TEMPERING COIL					DISCHARGE SOUND POWER/RADIATED SOUND POWER - dB							ELECTRICAL							
							PRIMARY INLET DIAMETER (INCHES)	OUTLET (INCHES)			AIR																		
DES.	NO.	MINIMUM CFM	MAXIMUM CFM	AIRFLOW CFM	MOTOR HP	E.S.P. IN. W.G.		W	H	CAPACITY MBH	AIRFLOW CFM	E.D.B. °F	L.D.B. °F	HEATING ELEMENT KW	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	MODULATION / CONTROL TYPE	VOLTS	PHASE	MCA	MOP	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
FPB	101	725	1560	825	1/2	0.25	12	15	16	44.3	1560	64	91	13.0	73/62	64/54	58/49	53/41	48/36	42/30	B	480	3	23.9	25	5	B	FDV4012	
FPB	102	1050	2000	950	1	0.25	16	17.5	20	60	2000	63	90	17.0	67/60	59/54	55/52	53/45	50/40	44/34	B	480	3	32.9	35	5	B	FDV5016	
FPB	103	575	1800	1225	1	0.25	16	17.5	20	46	1800	67	90	13.5	66/59	57/52	54/51	52/44	49/38	43/32	B	480	3	27.7	30	5	B	FDV5016	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.
3. MAXIMUM NC LEVEL BASED ON 0.3 IN. W.G. DOWNSTREAM STATIC PRESSURE AND 3 IN. W.G. PRIMARY AIR PRESSURE DROP.
4. MAXIMUM RADIATED NC LEVEL SHALL NOT EXCEED 35.

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-23-2204	ADDENDUM #4
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN KLH
CHECKED KLH
APPROVED SVM

PROJECT NO.
22102

DRAWING NO.
M7.5

7/22/2024 10:14:45 AM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

AIR TERMINAL TYPE

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

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

KEYED NOTES:
A. BASED ON 350 CFM
B. BASED ON 650 CFM
C. BASED ON 900 CFM
D. BASED ON 1500 CFM
E. BASED ON 2500 CFM
F. BASED ON 5300 CFM

ELECTRIC RADIANT WALL PANEL SCHEDULE

UNIT IDENTIFICATION			DIMENSIONS		ELECTRICAL					
DES.	NO.	CAPACITY WATTS	LENGTH INCHES	WIDTH INCHES	VOLTS	PHASE	MOP	SCCR KA	MODEL NUMBER	KEYED NOTES
ERWP	101	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	102	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	103	879	72	4.5	208	1	15	5	EB3-208D	
ERWP	104	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	105	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	106	879	72	4.5	208	1	15	5	EB3-208D	
ERWP	107	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	108	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	109	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	110	1319	108	4.5	208	1	15	5	EB3-208D	
ERWP	111	1319	108	4.5	208	1	15	5	EB3-208D	
ERWP	112	1319	108	4.5	208	1	15	5	EB3-208D	
ERWP	113	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	114	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	115	440	36	4.5	208	1	15	5	EB3-208D	
ERWP	116	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	117	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	118	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	119	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	120	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	121	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	122	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	123	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	124	1172	96	4.5	208	1	15	5	EB3-208D	
ERWP	125	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	126	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	127	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	128	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	129	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	130	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	131	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	132	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	133	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	201	1172	96	4.5	208	1	15	5	EB3-208D	
ERWP	202	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	203	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	204	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	205	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	206	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	207	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	208	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	209	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	210	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	211	586	48	4.5	208	1	15	5	EB3-208D	

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

AIR TERMINAL UNIT WITH ELECTRIC COIL SCHEDULE

UNIT IDENTIFICATION					AIR FLOW				AIR		ELECTRICAL											
DES.	NO.	INLET SIZE INCHES	AREA SERVED	UNIT SERVED FROM	COOLING MAXIMUM CFM	MINIMUM CFM	HEATING MAXIMUM CFM	MAXIMUM A.P.D. IN. W.G.	E.D.B. °F	L.D.B. °F	CAPACITY KW	CAPACITY MBH	NUMBER OF STAGES	VOLTS	PHASE	MCA	MOP	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES	PBA Schedule ID
TU	101	8Ø	B104 MEETING	ERU-5	380	145	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	102	6Ø	B119 CONFERENCE	ERU-5	150	80	150	0.75	55	76	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	103	6Ø	B105 ASST PRINCIPAL	ERU-5	125	80	125	0.75	55	80	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	104	6Ø	B106 PRINCIPAL	ERU-5	125	80	125	0.75	55	80	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	105	6Ø	B107 SPEECH	ERU-5	125	80	125	0.75	55	80	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	106	6Ø	B113 COUNSELING WAITING	ERU-5	200	80	150	0.75	55	76	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	107	6Ø	B108 PSYCHOLOGY	ERU-5	125	80	125	0.75	55	80	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	108	6Ø	B109 RECORDS & STORAGE	ERU-5	100	80	100	0.75	55	87	1.0	5.1	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	109	6Ø	B112 COUNSELING	ERU-5	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	110	6Ø	B114 COUNSELING	ERU-5	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	111	6Ø	B129 OFFICE	ERU-5	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	112	6Ø	B124 WORKROOM	ERU-5	150	80	150	0.75	55	76	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	113	6Ø	B122 ZEN DEN	ERU-5	200	80	150	0.75	55	76	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	114	6Ø	B115 SOCIAL WORKER	ERU-5	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	115	6Ø	B116 CLINIC	ERU-5	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	116	6Ø	B102 WELCOME CENTER	ERU-5	300	90	200	0.75	55	87	2.0	6.8	SCR	480	3	3.3	15.0	5	B	SDV		015
TU	117	6Ø	B125 GALLERY	ERU-2	300	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	118	6Ø	B139 TEACHER COLLAB	ERU-2	300	80	200	0.75	55	87	2.0	6.8	SCR	480	3	3.3	15.0	5	B	SDV		015
TU	119	12Ø	B144 VISUAL ARTS	ERU-2	1120	785	1120	0.75	55	83	10.0	34.1	SCR	480	3	16.4	20.0	5	B	SDV		015
TU	120	8Ø	B126 PASSAGE	ERU-2	400	400	400	0.75	55	91	4.5	15.4	SCR	480	3	7.4	15.0	5	B	SDV		015
TU	121	12Ø	B135 STEM-TEACHING	ERU-2	1150	720	1150	0.75	55	78	8.5	29.0	SCR	480	3	13.9	15.0	5	B	SDV		015
TU	122	12Ø	B136 STEM TECH	ERU-2	950	480	700	0.75	55	80	5.5	18.8	SCR	480	3	9.0	15.0	5	B	SDV		015
TU	123	16Ø	C103 LIFE SKILLS	ERU-2	1780	1080	1080	0.75	55	84	10.0	34.1	SCR	480	3	16.4	20.0	5	B	SDV		015
TU	124	6Ø	C107 PRACTICE	ERU-2	160	80	160	0.75	55	75	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	125	6Ø	C108 PRACTICE	ERU-2	160	80	160	0.75	55	75	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	126	6Ø	C106 ENSEMBLE	ERU-2	230	135	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	127	6Ø	C109 ENSEMBLE	ERU-2	230	135	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	128	8Ø	D102 MEDIA CENTER	ERU-3	500	350	350	0.75	55	87	3.5	11.9	SCR	480	3	5.7	15.0	5	B	SDV		015
TU	129	6Ø	D105 SMALL GROUP	ERU-3	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	130	6Ø	D104 SMALL GROUP	ERU-3	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	131	6Ø	D108 OFFICE/STORAGE	ERU-3	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	132	12Ø	D102 MEDIA CENTER	ERU-3	1480	920	920	0.75	55	83	8.0	27.3	SCR	480	3	13.1	15.0	5	B	SDV		015
TU	133	8Ø	F101 PASSAGE	ERU-8	550	400	550	0.75	55	84	5.0	17.1	SCR	480	3	8.2	15.0	5	B	SDV		015
TU	134	8Ø	F105 RESOURCE	ERU-8	500	300	370	0.75	55	89	4.0	13.6	SCR	480	3	6.6	15.0	5	B	SDV		015
TU	135	8Ø	F106 ESL	ERU-8	500	300	370	0.75	55	89	4.0	13.6	SCR	480	3	6.6	15.0	5	B	SDV		015
TU	136	12Ø	F138 ACTIVE LAB	ERU-8	1300	700	1300	0.75	55	79	10.0	32.4	SCR	480	3	16.4	20.0	5	B	SDV		015
TU	137	12Ø	F121 ACTIVE LAB	ERU-8	1200	700	1200	0.75	55	80	9.5	32.4	SCR	480	3	15.6	20.0	5	B	SDV		015
TU	138	12Ø	F109 LEARNING STUDIO	ERU-8	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	139	16Ø	F115 LEARNING COMMONS	ERU-8	1800	1450	1450	0.75	55	79	11.0	37.5	SCR	480	3	18.0	20.0	5	B	SDV		015
TU	140	12Ø	F111 LEARNING STUDIO	ERU-8	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	141	6Ø	F113 TEACHER COLLAB	ERU-8	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	142	12Ø	F116 LEARNING STUDIO	ERU-8	1000	570	670	0.75	55	88	7.0	23.9	SCR	480	3	11.5	15.0	5	B	SDV		015
TU	143	6Ø	F117 SMALL GROUP	ERU-8	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	144	6Ø	F118 SMALL GROUP	ERU-8	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	145	12Ø	D117 SPECIAL ED	ERU-8	1000	550	550	0.75	55	87	5.5	18.8	SCR	480	3	9.0	15.0	5	B	SDV		015
TU	146	12Ø	F128 LEARNING STUDIO	ERU-8	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	147	16Ø	F131 LEARNING COMMONS	ERU-8	1800	1450	1450	0.75	55	79	11.0	37.5	SCR	480	3	18.0	20.0	5	B	SDV		015
TU	148	12Ø	F147 LEARNING STUDIO	ERU-8	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	149	6Ø	F132 TEACHER COLLAB	ERU-8	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	150	12Ø	F134 LEARNING STUDIO	ERU-8	1000	570	670	0.75	55	88	7.0	23.9	SCR	480	3	11.5	15.0	5	B	SDV		015
TU	151	6Ø	F136 SMALL GROUP	ERU-8	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	152	6Ø	F135 SMALL GROUP	ERU-8	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	153	6Ø	D113 LIVE A	ERU-9	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	154	6Ø	E105 STAFF LOUNGE	ERU-9	270	110	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	155	8Ø	E101 PASSAGE	ERU-9	525	400	525	0.75	55	85	5.0	17.1	SCR	480	3	8.2	15.0	5	B	SDV		015
TU	156	10Ø	E107 RESOURCE	ERU-9	500	300	370	0.75	55	89	4.0	13.6	SCR	480	3	6.6	15.0	5	B	SDV		015
TU	157	12Ø	E108 ELECTIVE	ERU-9	1000	570	670	0.75	55	88	7.0	23.9	SCR	480	3	11.5	15.0	5	B	SDV		015
TU	158	12Ø	E138 ACTIVE LAB	ERU-9	1300	700	1300	0.75	55	79	10.0	32.4	SCR	480	3	16.4	20.0	5	B	SDV		015
TU	159	12Ø	E121 ACTIVE LAB	ERU-9	1200	700	1200	0.75	55	80	9.5	32.4	SCR	480	3	15.6	20.0	5	B	SDV		015
TU	160	12Ø	E109 LEARNING STUDIO	ERU-9	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	161	16Ø	E115 LEARNING COMMONS	ERU-9	1800	1450	1450	0.75	55	79	11.0	37.5	SCR	480	3	18.0	20.0	5	B	SDV		015
TU	162	12Ø	E111 LEARNING STUDIO	ERU-9	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	163	6Ø	E113 TEACHER COLLAB	ERU-9	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	164	12Ø	E116 LEARNING STUDIO	ERU-9	1000	570	670	0.75	55	88	7.0	23.9	SCR	480	3	11.5	15.0	5	B	SDV		015
TU	165	6Ø	E117 SMALL GROUP	ERU-9	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	166	6Ø	E118 SMALL GROUP	ERU-9	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	167	12Ø	D122 SPECIAL ED	ERU-9	1000	550	670	0.75	55	83	6.0	20.5	SCR	480	3	9.8	15.0	5	B	SDV		015
TU	168	8Ø	D121 SPECIAL ED	ERU-9	460	270	270	0.75	55	90	3.0	10.2	SCR	480	3	4.9	15.0	5	B	SDV		015
TU	169	16Ø	E129 LEARNING COMMONS	ERU-9	1800	1450	1450	0.75	55	79	11.0	37.5	SCR	480	3	18.0	20.0	5	B	SDV		015
TU	170	12Ø	E127 LEARNING STUDIO	ERU-9	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	171	12Ø	E128 LEARNING STUDIO	ERU-9	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	172	6Ø	E132 TEACHER COLLAB	ERU-9	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	173	12Ø	E134 LEARNING STUDIO	ERU-9	1000	570	670	0.75	55	88	7.0	23.9	SCR	120	3	11.5	15.0	5	B	SDV		015
TU	174	6Ø	E136 SMALL GROUP	ERU-9	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	175	6Ø	E137 SMALL GROUP	ERU-9	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	201	6Ø	D204 LOUNGE	ERU-10	300	220	220	0.75	55	91	2.5	8.5	SCR	480	3	4.1	15.0	5	B	SDV		015
TU	202	12Ø	D201 COMMONS	ERU-10	960	570	650	0.75	55	87	6.5	17.1	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	203	10Ø	D202 COMMONS	ERU-10	850	430	430	0.75	55	77	3.0	8.5	SCR	480	3	4.9	15.0	5	B	SDV		015
TU	204	10Ø	E207 RESOURCE	ERU-10	500	300	370	0.75	55	89	4.0	13.6	SCR	480	3	6.6	15.0	5	B	SDV		015
TU	205	12Ø	E208 ELECTIVE	ERU-10	1000	570	670	0.75	55	88	7.0	23.9	SCR	480	3	11.5	15.0	5	B	SDV		015
TU	206	12Ø	E238 ACTIVE LAB	ERU-10	1300	700	1300	0.75	55	79	10.0	32.4	SCR	480	3	16.4	20.0	5	B	SDV		015
TU	207	12Ø	E221 ACTIVE LAB	ERU-10	1200	700	1200	0.75	55	80	9.5	32.4	SCR	480	3	15.6	20.0	5	B	SDV		015
TU	208	12Ø	E209 LEARNING STUDIO	ERU-10	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	209	16Ø	E215 LEARNING COMMONS	ERU-10	1800	1450	1450	0.75	55	79	11.0	37.5	SCR	480	3	18.0	20.0	5	B	SDV		015
TU	210	12Ø	E211 LEARNING STUDIO	ERU-10	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	211	6Ø	E213 TEACHER COLLAB	ERU-10	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	212	12Ø	E216 LEARNING STUDIO	ERU-10	1000	570	670	0.75	55	88	7.0	23.9	SCR	480	3	11.5	15.0	5	B	SDV		015
TU	213	6Ø	E217 SMALL GROUP	ERU-10	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	214	6Ø	E218 SMALL GROUP	ERU-10	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	215	12Ø	E227 LEARNING STUDIO	ERU-10	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	216	16Ø	E229 LEARNING COMMONS	ERU-10	1800	1450	1450	0.75	55	79	11.0	37.5	SCR	480	3	18.0	20.0	5	B	SDV		015
TU	217	12Ø	E228 LEARNING STUDIO	ERU-10	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV		015
TU	218	6Ø	E232 TEACHER COLLAB	ERU-10	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	219	12Ø	E234 LEARNING STUDIO	ERU-10	1000	570	670	0.75	55	88	7.0	23.9	SCR	480	3	11.5	15.0	5	B	SDV		015
TU	220	6Ø	E235 SMALL GROUP	ERU-10	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015
TU	221	6Ø	E236 SMALL GROUP	ERU-10	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV		015

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.
3. COIL HEATING CAPACITY IS BASED ON HEATING CFM.
4. MAXIMUM AIR PRESSURE DROP IS BASED ON MAXIMUM CFM AND INCLUDES THE PRESSURE DROP OF THE ENTIRE ASSEMBLY INCLUDING HEATING COIL.
5. PROVIDE 480V 3 PHASE 3 WIRE.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	KLH
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M7.6

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POWER VENTILATOR SCHEDULE

UNIT IDENTIFICATION								MOTOR						ELECTRICAL					UNIT INLET Lw BY OCTAVE BAND									
DES.	NO.	SYSTEM SERVED	TYPE	AIRFLOW CFM	T.S.P. IN. W.G.	TIP SPEED FPM	FAN RPM	BHP	HP	RPM	MOTOR DRIVE TYPE	CURB HEIGHT INCHES	MODULATION / CONTROL TYPE	VOLTS	PHASE	FLA	SCCR KA (NOTE 3)	OPTIONS / ACCESSORIES	63 Hz (DB)	125 Hz (DB)	250 Hz (DB)	500 Hz (DB)	1000 Hz (DB)	2000 Hz (DB)	4000 Hz (DB)	8000 Hz (DB)	MODEL NUMBER	KEYED NOTES
EF	101	TOILET ROOMS	CENTRIFUGAL	870	0.50	4429	1512	0.17	1/4	1725	DIRECT	14	AUTO	120	1	2.9	5	B	73	76	76	68	63	62	57	51	G-99-VG	
EF	102	TOILET ROOMS	CENTRIFUGAL	70	0.30	1207	838	-	6 WATTS	-	DIRECT	-	AUTO	120	1	0.3	5	B	-	-	-	-	-	-	-	-	SP-A50-90-VG	1
EF	103	TOILET ROOMS	CENTRIFUGAL	70	0.30	1207	838	-	6 WATTS	-	DIRECT	-	AUTO	120	1	0.3	5	B	-	-	-	-	-	-	-	-	SP-A50-90-VG	1
EF	104	ART ROOM	CENTRIFUGAL	1000	0.50	4832	1650	0.21	1/4	1725	DIRECT	14	MANUAL	120	1	2.9	5	B	74	78	78	70	66	65	60	54	G-99-VG	
EF	105	TOILET ROOMS	CENTRIFUGAL	630	0.50	4466	1569	0.12	1/6	1725	DIRECT	14	AUTO	120	1	2.2	5	B	81	79	71	64	62	57	47	45	G-95-VG	
EF	106	STEM TEACHING	CENTRIFUGAL	1000	0.50	4832	1650	0.21	1/4	1725	DIRECT	14	MANUAL	120	1	2.9	5	B	74	78	78	70	66	65	60	54	G-99-VG	
EF	107	WORKSHOP	CENTRIFUGAL	150	0.30	2921	1373	0.03	1/15	1725	DIRECT	14	MANUAL	120	1	1.3	5	B	65	64	59	46	40	39	34	30	G-70-VG	
EF	108	LIFE SKILLS	CENTRIFUGAL	2800	2.13	6268	1451	2.06	3	-	DIRECT	14	VFC	208	3	9.5	5	B	-	-	-	-	-	-	-	-	DU180HFA	2, 3
EF	109	TOILET ROOMS	CENTRIFUGAL	630	0.50	4466	1569	0.12	1/6	1725	DIRECT	14	AUTO	120	1	2.2	5	B	81	79	71	64	62	57	47	45	G-95-VG	
EF	110	ACTIVE LAB	CENTRIFUGAL	1200	0.50	4339	1269	0.19	1/2	1725	DIRECT	14	MANUAL	208	1	3.8	5	B	69	74	75	69	61	60	55	53	G-120-VG	
EF	111	ACTIVE LAB	CENTRIFUGAL	1200	0.50	4339	1269	0.19	1/2	1725	DIRECT	14	MANUAL	208	1	3.8	5	B	69	74	75	69	61	60	55	53	G-120-VG	
EF	112	TOILET ROOMS	CENTRIFUGAL	70	0.30	1207	838	-	6 WATTS	-	DIRECT	-	AUTO	120	1	0.3	5	B	-	-	-	-	-	-	-	-	SP-A50-90-VG	1
EF	113	TOILET ROOMS	CENTRIFUGAL	70	0.30	1207	838	-	6 WATTS	-	DIRECT	-	AUTO	120	1	0.3	5	B	-	-	-	-	-	-	-	-	SP-A50-90-VG	1
EF	114	SPECIAL ED-3	CENTRIFUGAL	300	0.25	3246	1181	0.04	1/4	1800	DIRECT	14	AUTO	120	1	2.9	5	B	-	-	-	-	-	-	-	-	DU12HFA	2, 3
EF	115	TOILET ROOMS	CENTRIFUGAL	630	0.50	4466	1569	0.12	1/6	1725	DIRECT	14	AUTO	120	1	2.2	5	B	81	79	71	64	62	57	47	45	G-95-VG	
EF	116	ACTIVE LAB	CENTRIFUGAL	1200	0.75	4775	1396	0.26	1/2	1725	DIRECT	14	MANUAL	208	1	3.8	5	B	71	76	78	72	64	63	58	56	G-120-VG	
EF	117	ACTIVE LAB	CENTRIFUGAL	1200	0.75	4775	1396	0.26	1/2	1725	DIRECT	14	MANUAL	208	1	3.8	5	B	71	76	78	72	64	63	58	56	G-120-VG	
EF	118	TOILET ROOMS	CENTRIFUGAL	70	0.30	1207	838	-	6 WATTS	-	DIRECT	-	AUTO	120	1	0.3	5	B	-	-	-	-	-	-	-	-	SP-A50-90-VG	1
EF	119	TOILET ROOMS	CENTRIFUGAL	70	0.30	1207	838	-	6 WATTS	-	DIRECT	-	AUTO	120	1	0.3	5	B	-	-	-	-	-	-	-	-	SP-A50-90-VG	1
EF	120	KITCHEN HOOD	CENTRIFUGAL	1262	0.80	4296	1094	0.25	3/4	1800	DIRECT	14	AUTO	208	1	5.2	5	B	-	-	-	-	-	-	-	-	DU85HFA	2, 3
EF	121	KITCHEN HOOD	CENTRIFUGAL	1262	0.80	4296	1094	0.25	3/4	1800	DIRECT	14	AUTO	208	1	5.2	5	B	-	-	-	-	-	-	-	-	DU85HFA	2, 3
EF	122	DISHWASHER	CENTRIFUGAL	600	0.50	3750	1280	0.12	1/4	1725	DIRECT	14	AUTO	115	1	5.8	5	B	71	70	67	61	58	57	52	43	CUE-099-VG	
EF	123	MECHANICAL ROOM	CENTRIFUGAL	1300	0.50	4557	1333	0.22	1/2	1725	DIRECT	14	AUTO	208	1	3.8	5	B	71	75	77	71	63	62	57	55	G-120-VG	
EF	124	LIFE SKILLS	CENTRIFUGAL	2745	1.25	5188	1201	1.21	3	-	DIRECT	14	VFC	208	3	7.2	5	B	-	-	-	-	-	-	-	-	DU180HFA	2, 3
EF	201	TOILET ROOMS	CENTRIFUGAL	560	0.50	4288	1506	0.11	1/6	1725	DIRECT	14	AUTO	120	1	2.2	5	B	81	78	69	63	61	56	45	48	G-95-VG	
EF	202	ACTIVE LAB	CENTRIFUGAL	1200	0.50	4339	1269	0.19	1/2	1725	DIRECT	14	MANUAL	208	1	3.8	5	B	69	74	75	69	61	60	55	53	G-120-VG	
EF	203	ACTIVE LAB	CENTRIFUGAL	1200	0.50	4339	1269	0.19	1/2	1725	DIRECT	14	MANUAL	208	1	3.8	5	B	69	74	75	69	61	60	55	53	G-120-VG	
EF	204	TOILET ROOMS	CENTRIFUGAL	70	0.30	1207	838	-	6 WATTS	-	DIRECT	-	AUTO	120	1	0.3	5	B	-	-	-	-	-	-	-	-	SP-A50-90-VG	1
EF	205	TOILET ROOMS	CENTRIFUGAL	70	0.30	1207	838	-	6 WATTS	-	DIRECT	-	AUTO	120	1	0.3	5	B	-	-	-	-	-	-	-	-	SP-A50-90-VG	1

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

KEYED NOTES:
1. PROVIDE WITH INTEGRAL MOTION SENSOR.
2. BASED ON CAPTIVEAIRE.
3. UL-762 LISTED.

FAN SCHEDULE

UNIT IDENTIFICATION								MOTOR					ELECTRICAL					UNIT INLET Lw BY OCTAVE BAND									
DES.	NO.	SYSTEM SERVED	TYPE	AIR FLOW CFM	T.S.P. IN. W.G.	RPM	OUTLET VELOCITY FPM	BHP	HP	RPM	DRIVE TYPE	MODULATION / CONTROL TYPE	VOLTS	PHASE	FLA	SCCR KA (NOTE 3)	OPTIONS / ACCESSORIES	63 Hz (DB)	125 Hz (DB)	250 Hz (DB)	500 Hz (DB)	1000 Hz (DB)	2000 Hz (DB)	4000 Hz (DB)	8000 Hz (DB)	MODEL NUMBER	KEYED NOTES
RF	101	FPB-101	CENTRIFUGAL	1940	0.25	1520	886	0.39	0.75	1725	DIRECT	AUTO	208	1	5.4	5	B	72	76	81	75	65	65	61	55	SQ-130-VG	
RF	102	FPB-102	CENTRIFUGAL	2390	0.25	1356	882	0.47	0.75	1725	DIRECT	AUTO	208	1	5.4	5	B	72	73	80	75	67	65	62	59	SQ-140-VG	
RF	103	C201	CENTRIFUGAL	650	0.25	1074	496	0.06	0.25	1725	DIRECT	AUTO	208	1	1.7	5	B	62	65	61	60	56	51	43	42	SQ-100-VG	
RF	104	-	CENTRIFUGAL	450	0.25	1454	450	0.05	0.1	1725	DIRECT	AUTO	208	1	0.8	5	B	70	70	67	59	56	54	52	44	SQ-90-VG	
RF	105	-	CENTRIFUGAL	450	0.25	1454	450	0.05	0.1	1725	DIRECT	AUTO	208	1	0.8	5	B	70	70	67	59	56	54	52	44	SQ-90-VG	
RF	106	-	CENTRIFUGAL	450	0.25	1454	450	0.05	0.1	1725	DIRECT	AUTO	208	1	0.8	5	B	70	70	67	59	56	54	52	44	SQ-90-VG	
RF	201	-	CENTRIFUGAL	450	0.25	1454	450	0.05	0.1	1725	DIRECT	AUTO	208	1	0.8	5	B	70	70	67	59	56	54	52	44	SQ-90-VG	

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.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

MECHANICAL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN WTF
CHECKED KLH
APPROVED SVM

PROJECT NO.
22102

DRAWING NO.
M7.7

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TEMPERATURE CONTROL - SYMBOLS LIST

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
AFC	AIR FLOW CONTROLLER
AQ	AQUASTAT, STRAP ON BULB
CO2	CARBON DIOXIDE SENSOR – WALL MOUNTED
CO2	CARBON DIOXIDE SENSOR – DUCT MOUNTED
CO	CARBON MONOXIDE SENSOR – WALL MOUNTED
CO	CARBON MONOXIDE SENSOR – DUCT MOUNTED
CS	CURRENT SWITCH
CT	CURRENT TRANSMITTER
	DAMPER – OPPOSED BLADE
	DAMPER – PARALLEL BLADE
M	DAMPER MOTOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
DPS	DIFFERENTIAL PRESSURE SWITCH
CM	FIRE ALARM SYSTEM, ADDRESSABLE CONTROL MODULE
IM	FIRE ALARM SYSTEM, ADDRESSABLE INTERFACE MODULE
FMS	FLOW MEASURING STATION
FM	FLOW METER
FS	FLOW SWITCH
FZ	FREEZESTAT
F/	GAUGE – FLOW
P/	GAUGE – PRESSURE
T/	GAUGE – TEMPERATURE
	GUARD FOR STAT OR SENSOR
	HUMIDIFIER
H	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)
H	HUMIDITY SENSOR, DUCT MOUNTED
LVL	LEVEL SWITCH OR TRANSMITTER
LS	LIMIT SWITCH
	LINE – ELECTRIC
	LINE – INSTRUMENT AIR
M/S	MOTOR STARTER
OS	OCCUPANCY SENSOR
R	PILOT LIGHT OR BEACON R – RED LENS A – AMBER LENS B – BLUE LENS G – GREEN LENS
PT	PRESSURE TRANSMITTER
R	RELAY, ELECTRIC
N	SELECTOR SWITCH, (N=NUMBER OF POSITIONS)
AI	SIGNAL – DDC/BAS, ANALOG INPUT
AO	SIGNAL – DDC/BAS, ANALOG OUTPUT
DI	SIGNAL – DDC/BAS, DIGITAL INPUT
DO	SIGNAL – DDC/BAS, DIGITAL OUTPUT
AI	SIGNAL – PACKAGED EQUIPMENT, ANALOG INPUT
AO	SIGNAL – PACKAGED EQUIPMENT, ANALOG OUTPUT
DI	SIGNAL – PACKAGED EQUIPMENT, DIGITAL INPUT
DO	SIGNAL – PACKAGED EQUIPMENT, DIGITAL OUTPUT

NOTE: REFER TO MECHANICAL STANDARDS ON DRAWING M0.1 FOR ADDITIONAL SYMBOLS & ABBREVIATIONS THAT MAY BE USED ON TEMPERATURE CONTROL DRAWINGS.

SCHEMATIC SYMBOLS (CONT.)

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

WIRING SYMBOLS

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

WIRING SYMBOLS (CONT.)

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

WIRING TERMS

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

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

ABBREVIATION LIST

ABBREVIATION	DESCRIPTION
AAV	AUTOMATIC AIR VENT
ACC	AIR COOLED CONDENSER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
AMP	AMPERE
APD	AIR PRESSURE DROP
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS
AUX	AUXILIARY
BAS	BUILDING AUTOMATION SYSTEM
C	COMMON
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHWP	CHILLED WATER PUMP
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CLG	COOLING
CLP	COMPUTER LOOP PUMP
CLR	COMPUTER LOOP RETURN
CLS	COMPUTER LOOP SUPPLY
CO2	CARBON DIOXIDE
COND	CONDENSATE
CONT	CONTINUATION OR CONTINUED
CONTR	CONTRACTOR
CONV	CONVECTOR
COS	CENTRAL OPERATOR STATION
CP	CIRCULATING PUMP
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
CW	DOMESTIC COLD WATER
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DA	DISCHARGE AIR
DAT	DISCHARGE AIR TEMPERATURE
DB	DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREES
DMPR	DAMPER
D/N	DAY/NIGHT
DN	DOWN
DPR	DAMPER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DX	DIRECT EXPANSION
(E)	EXISTING
EA	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
ECUH	ELECTRIC CABINET UNIT HEATER
EDB	ENTERING DRY BULB
EF	EXHAUST FAN
EFF	EFFICIENCY
EHC	ELECTRIC HEATING COIL
ELEC	ELECTRICAL
ERCP	ELECTRIC RADIANT CEILING PANEL
ERU	ENERGY RECOVERY UNIT
EUH	ELECTRIC UNIT HEATER
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
°F	DEGREES FAHRENHEIT
F&B	FACE AND BYPASS DAMPER
FAS	FIRE ALARM SYSTEM
FCU	FAN COIL UNIT
FLR	FLOOR
FM	FLOW MEASURING DEVICE
FSE	FOOD SERVICE EQUIPMENT
FT	FEET
FTR	FINNED TUBE RADIATION
GPM	GALLONS PER MINUTE
GRH	GRAVITY RELIEF HOOD
HOA	HAND/OFF/AUTO
HP	HEAT PUMP
HP	HORSEPOWER
HPLP	HEAT PUMP LOOP PUMP
HPLR	HEAT PUMP LOOP RETURN
HPLS	HEAT PUMP LOOP SUPPLY
HR	HOUR
HTG	HEATING
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HWH	HOT WATER HEATING
HWHR	HOT WATER HEATING RETURN
HWHS	HOT WATER HEATING SUPPLY
HW	DOMESTIC HOT WATER
HWR	DOMESTIC HOT WATER RETURN
HX	HEAT EXCHANGER
HV	HEATING VENTILATING
IAQ	INDOOR AIR QUALITY
IN	INCHES
JC	JANITOR'S CLOSET
KWH	KILOWATT–HOUR
KW	KILOWATT
LBS/HR	POUNDS PER HOUR
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKE–UP AIR UNIT
MAX	MAXIMUM
MBH	THOUSAND BTUS PER HOUR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MMBH	MILLION BTUS PER HOUR
M/S	MOTOR STARTER
MR	MANUAL RESET
MTD	MOUNTED
MTR	MOTOR
NC	NORMALLY CLOSED
NCTC	NORMALLY CLOSED TIMED CLOSED
NCTO	NORMALLY CLOSED TIMED OPEN
NIC	NOT IN CONTRACT
NFPA	NATIONAL FIRE PROTECTION AGENCY
NO	NORMALLY OPEN
NOTC	NORMALLY OPEN TIMED CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NSB	NIGHT SETBACK
OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
PACU	PACKAGED AIR CONDITIONING UNIT
PD	PRESSURE DROP (FEET OF WATER)
PHR	PERIMETER HEAT RETURN
PHS	PERIMETER HEAT SUPPLY
PNL	PANEL
PPM	PARTS PER MILLION
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
R	RETURN
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RCP	RADIANT CEILING PANEL
RELA	RELIEF AIR
REQD	REQUIRED
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RHWH	RADIANT HOT WATER HEATING
RHWHR	RHWH RETURN
RHWHS	RHWH SUPPLY
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SF	SUPPLY FAN
SP	STATIC PRESSURE
S/S	START/STOP
STD	STANDARD
STM	STEAM
SZ	SINGLE–ZONE
S/W	SUMMER/WINTER
SW	SWITCH
TC	TEMPERATURE CONTROL
TCP	TEMPERATURE CONTROL PANEL
TEMP	TEMPERATURE
THR	TERMINAL HEATING RETURN
THS	TERMINAL HEATING SUPPLY
TSP	TOTAL STATIC PRESSURE
TU	(AIR) TERMINAL UNIT
TYP	TYPICAL
UH	UNIT HEATER
UL	UNDERWRITER'S LABORATORY
UV	UNIT VENTILATOR
VAV	VARIABLE AIR VOLUME
VSD	VARIABLE SPEED DRIVE
VUV	VERTICAL UNIT VENTILATOR
WC	WATER COLUMN
XFMR	TRANSFORMER

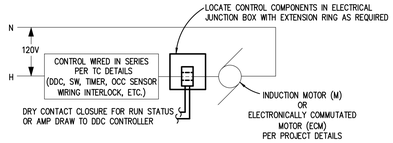
GENERAL NOTES

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.

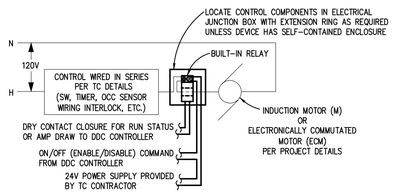
ALL ROOM SENSORS SHALL COMPLY WITH SCHOOL DISTRICT STANDARDS.

ALL DDC SENSOR WIRING MUST BE CONCEALED WITHIN THE WALLS.

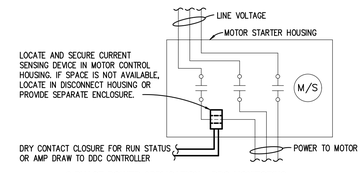
ANY USE OF WIRING WHETHER IN RACEWAY OR WIREMOLD IS PROHIBITED WITHOUT THE CONSENT OF THE ARCHITECT.



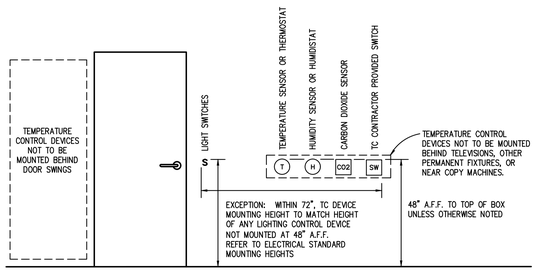
1-PHASE POWER APPLICATION - DDC MONITORING



1-PHASE POWER APPLICATION - COMBO DDC MONITORING & CONTROL

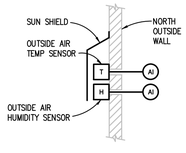


3-PHASE POWER APPLICATION - DDC MONITORING



TC DEVICE STANDARD MOUNTING HEIGHTS DETAIL

NO SCALE



OA SENSOR INSTALLATION DETAIL

NO SCALE

NOTES:

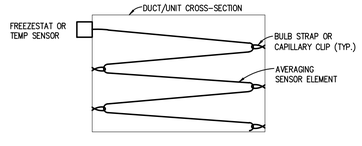
1. TC CONTRACTOR SHALL PROVIDE OUTSIDE AIR TEMPERATURE AND HUMIDITY SENSORS FOR DDC SYSTEM.
2. CALCULATE OA ENTHALPY OR DEW POINT TEMPERATURE AS REQUIRED PER SEQUENCE OF OPERATION REQUIREMENTS.
3. BROADCAST OUTSIDE AIR TEMPERATURE, HUMIDITY, AND CALCULATED OA ENTHALPY OR DEW POINT TEMPERATURE, AS REQUIRED, THROUGH BAS COMMUNICATION NETWORK TO CONTROLLERS REQUIRING INFORMATION FOR DDC PROGRAMMING LOGIC.

CURRENT SWITCH INSTALLATION DETAILS

TYPICAL

NOTES:

1. CURRENT SWITCH (CS) OR CURRENT TRANSDUCER (CT) AMP MONITORING AS APPLICABLE PER CONTROL DETAILS 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. REVIEW EQUIPMENT SHOP DRAWINGS TO DETERMINE POTENTIAL AMPERAGE RANGE OF FAN OR PUMP OPERATION FOR AMPERAGE TRIP SETTING REQUIREMENTS PRIOR TO SELECTING APPROPRIATE CURRENT SWITCH (MINIMUM SPEED AMPERAGE FOR FPTU WITH ECM CAN BE VERY LOW).
3. FOR ECM CURRENT SWITCH APPLICATIONS: PROVIDE CURRENT SWITCH RATED FOR ECM OPERATION WITH AMPERAGE TRIP SETTING HIGHER THAN TRICKLE/IDLE/STANDBY AMPERAGE ASSOCIATED WITH ECM WHEN OFF AND AMPERAGE TRIP SETTING LOWER THAN THE MINIMUM SPEED OPERATION OF FAN OR PUMP AS SET BY THE TAB CONTRACTOR.
4. FOR INDUCTION MOTOR CURRENT SWITCH APPLICATIONS (AS APPLICABLE): AMPERAGE TRIP SETTING SHALL BE ADJUSTABLE TO ACCOMMODATE VFC MINIMUM SPEED SETTING, TO DETECT FAN BELT LOSS, OR TO DETECT PUMP COUPLING DETACHMENT.
5. 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 LENGTH 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.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DJT
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M8.1

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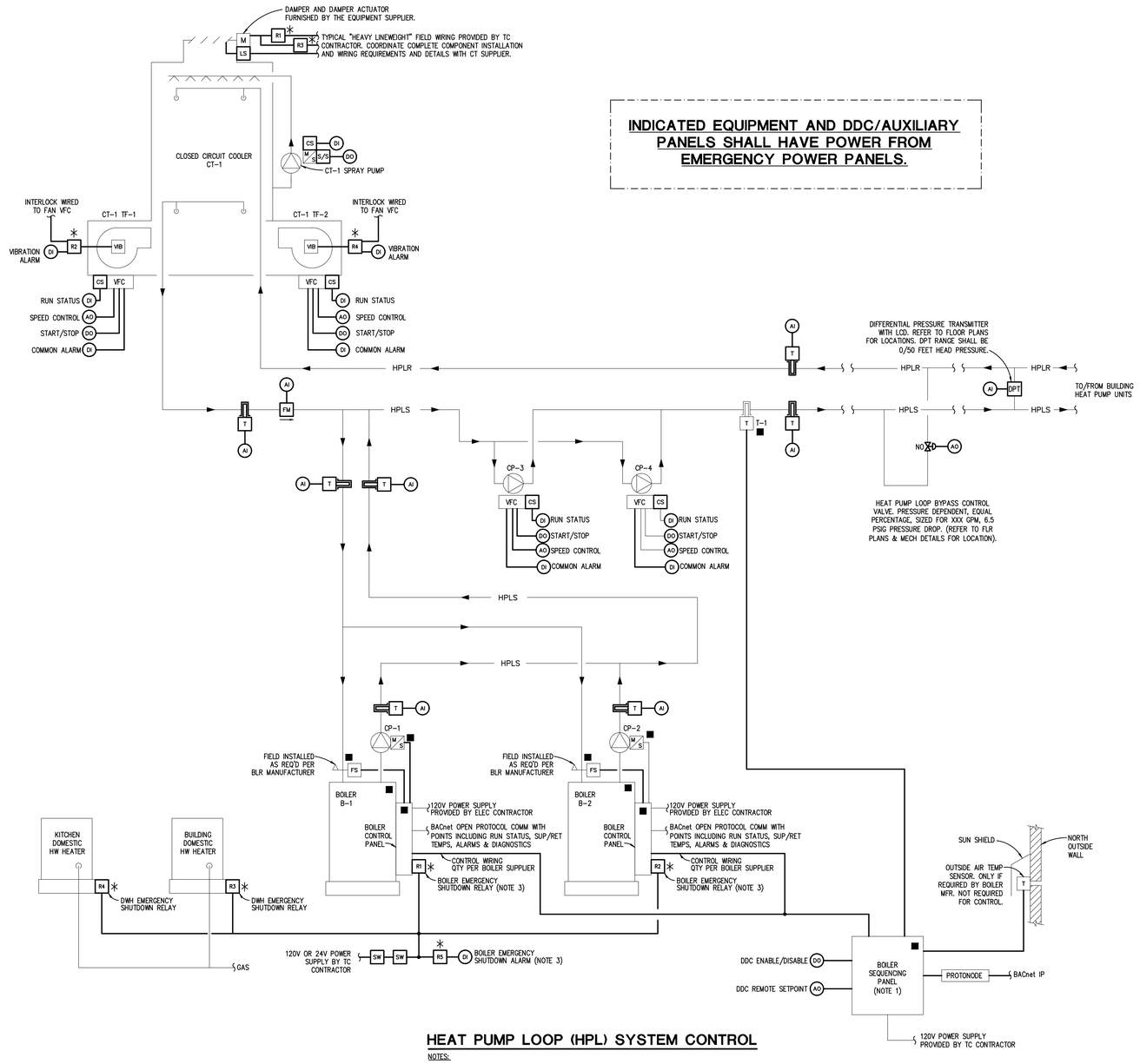
TC GENERAL NOTES

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



INDICATED EQUIPMENT AND DDC/AUXILIARY PANELS SHALL HAVE POWER FROM EMERGENCY POWER PANELS.

SEQUENCE OF OPERATION

HEAT PUMP LOOP SYSTEM:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, MODE POINTS, ETC., INCLUDING TIME-OF-DAY HOURS OF OPERATION AND SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION. PROVIDE CONTROL STATEMENTS TO PREVENT "LOOP WINDUP".

1. HEAT PUMP LOOP SYSTEM SHALL BE ACTIVATED FOR CONTINUOUS OPERATION EYAR ROUND.
2. HEAT PUMP LOOP (HPL) CIRC PUMPS CP-3 & CP-4 SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ONE OF THE TWO PUMPS SHALL BE ACTIVATED BY DDC AS "LEAD" TO OPERATE CONTINUOUSLY. THE OTHER WILL SERVE AS "STANDBY" PUMP.
3. DDC SHALL ALTERNATE HPL CP OPERATION AT THE BEGINNING OF EACH MONTH – OPERATOR SELECTABLE.
4. DDC SHALL MONITOR OPERATING STATUS OF EACH HPL CP. UPON "LEAD" PUMP FAILURE, DDC SHALL ACTIVATE FAILURE ALARM AND AUTOMATICALLY START THE "STANDBY" PUMP. DDC SHALL TOTALIZE EACH PUMP'S RUN TIME HOURS OF OPERATION.
5. VFC COMMON FAILURE ALARM FOR EACH HPL CP SHALL BE MONITORED BY DDC THRU VARIABLE FREQUENCY CONTROLLER (VFC) INTERFACE.
6. DDC SHALL MODULATE THE VFC OF THE "ACTIVE" HPL CP TO MAINTAIN LOOP DIFFERENTIAL PRESSURE SETPOINT TO BE DETERMINED BY TAB CONTRACTOR. INITIAL SETPOINT SHALL BE 20 FEET HEAD DIFFERENTIAL PRESSURE.
7. WHEN "ACTIVE" HPL CP SPEED IS REDUCED TO THE PUMP'S LOW FLOW LIMIT SETPOINT, BASED ON MFR'S PUMP CURVE, AND THE REMOTE DIFFERENTIAL PRESSURE (DP) IS ABOVE DP SETPOINT, DDC SHALL MODULATE THE HPL LOOP BYPASS VALVE TO ACHIEVE DP SETPOINT WHILE HPL CP SPEED MAINTAINS THE HPLS FLOW LOW LIMIT SETPOINT VIA HPL FLOW METER. WHEN HPL LOOP BYPASS VALVE MODULATES TO FULL CLOSED POSITION, AND DP IS LESS THAN DP SETPOINT, DDC MODULATES CP SPEED HIGHER TO MAINTAIN DP SETPOINT.
8. THE HPL SUPPLY TEMPERATURE (T-1) SHALL BE MAINTAINED BETWEEN 70°F & 85°F BY DDC. THE FOLLOWING SETPOINTS SHALL BE USED TO ENABLE/DISABLE THE COOLING TOWER AND HWH SYSTEMS:
   A. COOLING TOWER SYSTEM IS ENABLED WHEN T-1 RISES ABOVE 85°F.
   B. COOLING TOWER SYSTEM IS DISABLED WHEN T-1 DROPS BELOW 80°F FOR A 30 MINUTE PERIOD.

COOLING TOWER (CT) CONTROL:

10. CT FANS TF-1 & TF-2 SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ONE OF THE TWO FANS SHALL BE ACTIVATED BY DDC AS "LEAD" TO OPERATE. THE OTHER WILL SERVE AS "LAG" PUMP.
11. DDC SHALL ALTERNATE CT FAN OPERATION AT THE BEGINNING OF EACH MONTH – OPERATOR SELECTABLE.
12. DDC SHALL MONITOR OPERATING STATUS OF EACH CT FAN. UPON "LEAD" CT FAN FAILURE, DDC SHALL ACTIVATE A FAILURE ALARM AND AUTOMATICALLY START THE "LAG" CT FAN. DDC SHALL TOTALIZE EACH FAN'S RUN TIME HOURS OF OPERATION.
13. VFC COMMON FAILURE ALARM FOR CT FAN SHALL BE MONITORED BY DDC THRU RESPECTIVE VFC INTERFACE.
14. WHEN CT SYSTEM IS ENABLED AND THE "LEAD" HPL CP IS PROVEN RUNNING VIA CURRENT SWITCH, DDC SHALL START THE CT SPRAY PUMP, START THE "LEAD" CT FAN, AND MODULATE "LEAD" CT FAN SPEED TO MAINTAIN CT LEAVING WATER (HPLS) TEMPERATURE SETPOINT OF 85°F. IF CT FAN SPEED DECREASES MINIMUM SPEED (BASED ON MFR. FAN CURVE) AND HPLS TEMPERATURE DROPS TO 80°F, DDC SYSTEM SHALL CYCLE "LEAD" CT FAN OFF UNTIL HPLR TEMPERATURE RISES ABOVE 85°F.
15. UPON INCREASE IN HPLS TEMPERATURE, "LEAD" CT FAN SPEED MAY INCREASE TO 95% OF DESIGN SPEED. WHEN HPLS TEMPERATURE INCREASES ABOVE 90°F SETPOINT, DDC SHALL START THE "LAG" CT FAN. WHILE DECREASING "LEAD" CT FAN SPEED, DDC SHALL INCREASE "LAG" CT FAN SPEED, UNTIL BOTH FANS ARE CONTROLLED BY DDC AT THE SAME SPEED SIGNAL TO MAINTAIN HPLS TEMPERATURE SETPOINT OF 85°F. BOTH CT FANS MAY INCREASE TO MAXIMUM DESIGN SPEED TO MAINTAIN CT HPLS TEMPERATURE SETPOINT.
16. UPON DECREASE OF HPLS TEMPERATURE BELOW 82°F SETPOINT, DDC SHALL RAMP BOTH CT FANS DOWN TO 45% DESIGN SPEED SIGNAL. UPON FURTHER DROP IN HPLS TEMPERATURE, DDC SHALL COMMAND THE "LAG" CT FAN OFF AND MAINTAIN HPLS TEMPERATURE SETPOINT WITH THE "LEAD" CT FAN.
17. DDC SHALL MONITOR COOLING TOWER SPRAY PUMP OPERATION THRU CURRENT SWITCH. UPON PUMP FAILURE, DDC SHALL PROVIDE AN ALARM.
18. WHEN COOLING TOWER IS DISABLED, DDC SHALL DEACTIVATE SPRAY PUMP.
19. BASIN HEATER SHALL BE CONTROLLED BY PACKAGED THERMOSTAT. BASIN HEATER SHALL BE DISABLED THRU HARDWIRED CUT-OUT INTERLOCK WHENEVER SPRAY PUMP IS ACTIVATED.
20. CT BASIN LEVEL IS CONTROLLED BY MFRs BASIN WATER LEVEL CONTROL AND MAKE-UP WATER VALVE.

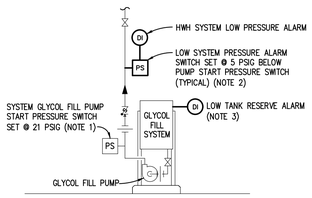
HWH SYSTEM CONTROL:

21. DDC SHALL ENABLE THE HOT WATER HEATING (HWH) SYSTEM 24X7 YEAR-ROUND. MFR'S OA TEMP SENSOR SHALL BE WIRED ONLY IF THE BOILER SEQUENCING PANEL REQUIRES THE SENSOR INPUT FOR OPERATION. OTHERWISE IT IS NOT REQUIRED.
22. THE BOILER SEQUENCING PANEL SHALL ACTIVATE OR DEACTIVATE BOILERS AND CONTROL BOILER STAGES/FIRING RATES AS REQUIRED TO MAINTAIN HPLS TEMPERATURE (T-1) SETPOINT OF 50°F.
23. HWH SYSTEM IS DISABLED WHEN T-1 RISES ABOVE 55°F FOR A 30 MINUTE PERIOD WHEN OUTSIDE AIR TEMPERATURE IS GREATER THAN 58°F.
24. BOILER CIRC PUMPS CP-1 & CP-2 SHALL HAVE START/STOP CAPABILITY FROM THE RESPECTIVE BOILERS' LOCAL CONTROL PANEL.
25. THE BOILER SEQUENCING PANEL SHALL INCLUDE OPERATOR SELECTABLE BOILER LEAD/LAG OPERATION OR FIRST ON/FIRST OFF OPERATION.
26. WHENEVER A BOILER CIRCUIT IS ACTIVATED, ITS RESPECTIVE CIRC PUMP SHALL BE ACTIVATED BY FACTORY WIRED PUMP RELAY. BOILER SHALL NOT FIRE UNTIL FLOW IS PROVEN BY FLOW SWITCH.
27. WHENEVER A BOILER IS DEACTIVATED, A BOILER SYSTEM CONTROLLED TIME DELAY SHALL KEEP PUMP RUNNING FOR A FEW MINUTES (TIME BASED ON BOILER MANUFACTURER RECOMMENDATION) TO DISSIPATE HEAT FROM THE DEACTIVATED BOILER.
28. EACH BOILER SAFETY CONTROLS SHALL INCLUDE AN AUTO-RESET HI-LIMIT (BOILER OPERATOR) WITH SETPOINT AND A MANUAL-RESET HI-LIMIT WITH SETPOINT BASED ON BOILER SUPPLIER'S RECOMMENDATIONS.
29. DDC SHALL MONITOR BOILER RUN STATUS AND COMMON ALARM FOR EACH BOILER THROUGH DRY CONTACTS AVAILABLE IN RESPECTIVE BOILER CONTROL PANEL.
30. FOR DIAGNOSTIC PURPOSES, DDC SHALL MONITOR EACH BOILER'S SUPPLY TEMPERATURE, BOILER COMMON HEADER SUPPLY AND RETURN, AND HPL SUPPLY AND RETURN TEMPERATURES.
31. WHEN ONE OF THE REMOTE BOILER SHUTDOWN SWITCHES IS PUSHED, BURNER CONTROLS FOR ALL BOILERS SHALL BE DE-ENERGIZED THRU HARDWIRE INTERLOCK. DDC SHALL MONITOR SWITCH CIRCUIT AND ACTIVATE ALARM WHEN REMOTE BOILER SHUTDOWN CONDITION OCCURS.
32. WHEN EACH COOLING TOWER'S VIBRATION SWITCH ALARM IS SENSED, DDC SHALL SHUTDOWN THE RESPECTIVE TOWER IN AN ORDERLY MANNER AND PROVIDE THE BAS WITH AN ALERT THAT "SYSTEM CAPACITY IS REDUCED." VIBRATION SWITCH SHALL BE HARDWIRED INTERLOCKED TO THE RESPECTIVE TOWER'S VFC SAFETY CIRCUIT.
33. DDC SHALL MONITOR GLYCOL FILL STATION AND PROVIDE AN ALARM ON LOW PRESSURE.

HEAT PUMP LOOP (HPL) SYSTEM CONTROL

NOTES:

1. ■ INDICATED COMPONENT FURNISHED BY BOILER SUPPLIER AND INSTALLED BY TC CONTRACTOR. DEPENDING ON BOILER MANUFACTURER, THE BOILER SEQUENCING FUNCTION MAY RESIDE WITH THE BOILER CONTROLLER THAT IS DESIGNATED AS THE "MASTER".
2. COORDINATE ALL WIRING AND TERMINATIONS WITH BOILER SUPPLIER.
3. TC CONTRACTOR SHALL PROVIDE BOILER ROOM EMERGENCY SHUTDOWN COMPONENTS AND WIRING. REFER TO REMOTE BOILER ROOM EMERGENCY SHUTDOWN WIRING DIAGRAM.
4. ✳ INDICATES TEMPERATURE CONTROL PANEL MOUNTED COMPONENT.
5. TYPICAL "HEAVY LINEWEIGHT" FIELD WIRING PROVIDED BY TC CONTRACTOR. COORDINATE COMPLETE COMPONENT INSTALLATION AND WIRING REQUIREMENTS AN DETAILS WITH EQUIPMENT SUPPLIER.

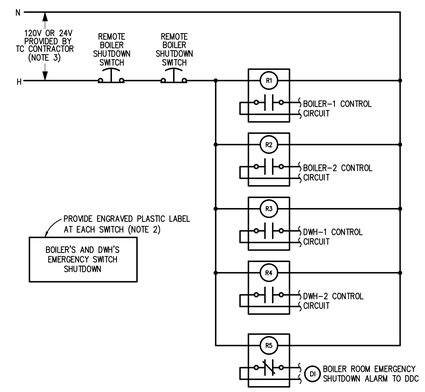


GLYCOL FILL STATION MONITORING

FOR HWH SYSTEM

NOTE:

1. PUMP CONTROL PRESSURE SWITCH AND ASSOCIATED CONTROL WIRING ARE PROVIDED WITH GLYCOL FILL STATION.
2. PRESSURE SWITCH FOR ALARM MONITORING SHALL BE FURNISHED BY TC CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
3. DRY CONTACTS FOR REMOTE MONITORING OF LOW TANK RESERVE ALARM PROVIDED WITH GLYCOL FILL STATION.



REMOTE BOILER ROOM EMERGENCY SHUTDOWN WIRING

NOTES:

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

SEQUENCE OF OPERATION:

1. UNDER NORMAL OPERATING CONDITIONS THE CIRCUIT SHALL BE ENERGIZED AND THE RELAY'S NORMALLY OPEN (NO) CONTACTS SHALL BE CLOSED. WHEN A SWITCH IS PUSHED (LATCHED) THE RELAY CONTACTS SHALL OPEN AND INTERRUPT BOILERS' CONTROL CIRCUIT AND DOMESTIC HOT WATER HEATERS' SHUTDOWN CIRCUIT. WHEN THE KEY IS TURNED TO RELEASE THE SWITCH, THE RELAYS SHALL BE ENERGIZED AND ITS NORMALLY OPEN CONTACTS SHALL CLOSE, RE-ENERGIZING ALL CONTROL CIRCUITS.
2. DDC SHALL ACTIVATE AN ALARM WHEN A REMOTE SWITCH HAS BEEN PUSHED.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DJT
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M8.2

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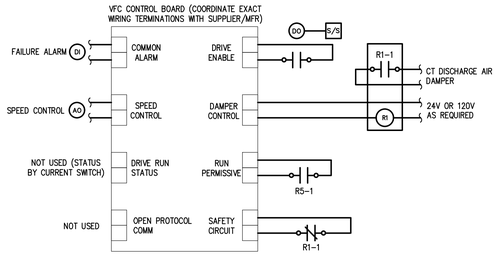


CT-1 TF-1 VFC WIRING

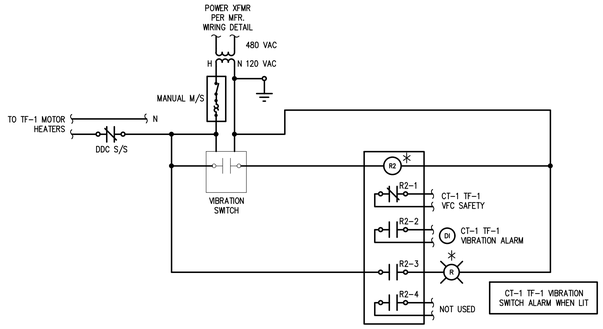
NOTES:

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

SEQUENCE OF OPERATION

TOWER FAN TF-1 & VIBRATION SWITCH CONTROLS:

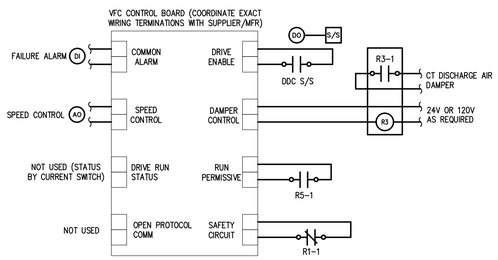
1. REFER TO COOLING TOWER SEQUENCE OF OPERATION FOR TOWER FAN CONTROL.
2. IF THE TOWER FAN VIBRATION SWITCH (BY MFR.) ACTIVATES, INTERLOCK WIRING SHALL ENERGIZE CONTROL RELAY.
3. CONTROL RELAY WIRING SHALL SHUTDOWN (RUN PERMISSIVE) THE RESPECTIVE VFC FOR THE TOWER FAN, PROVIDE AN ALARM TO THE BAS, AND TURN ON INDICATING LIGHT ON THE CONTROL PANEL DOOR.
4. WHEN VIBRATION SWITCH IS RESET AT THE TOWER, WIRING INTERLOCK SHALL ENABLE THE VFC (RUN PERMISSIVE, BAS ALARM SHALL RETURN TO NORMAL, AND TURN OFF INDICATING LIGHT ON THE CONTROL PANEL DOOR.
5. INTERLOCK WIRING WITH DDC DO POINT SHALL ENABLE AND DISABLE THE TOWER FAN MOTOR'S SPACE HEATER.



CT-1 TF-1 VIBRATION INTERLOCK WIRING

NOTES:

1. ✳ INDICATES PANEL MOUNTED COMPONENT. MOUNT RED INDICATING LIGHT ON PANEL DOOR.
2. ALL WORK SHOWN SHALL BE BY TEMPERATURE CONTROLS CONTRACTOR. PROVIDE CONTROL PANEL WITH NEMA RATING BASED ON PANEL LOCATION.
3. VIBRATION SWITCH IS FURNISHED AND MOUNTED AT TOWER FAN BY TOWER MFR.
4. RED INDICATING LIGHT, WIRING, AND CONTROL DEVICES (OTHER THAN VIBRATION SWITCH), SHALL BE INSTALLED IN TC AUX. PANEL BY TCC AND LABELED "TF-1 VIBRATION TRIP".



CT-1 TF-2 VFC WIRING

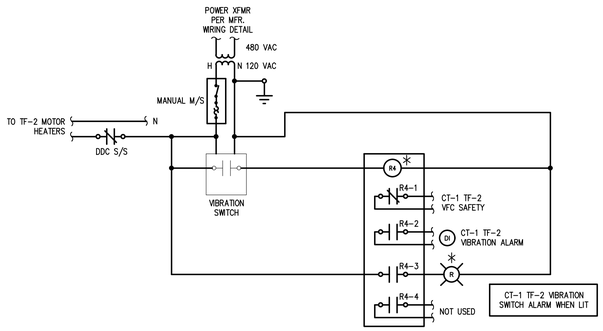
NOTES:

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

SEQUENCE OF OPERATION

TOWER FAN TF-2 & VIBRATION SWITCH CONTROLS:

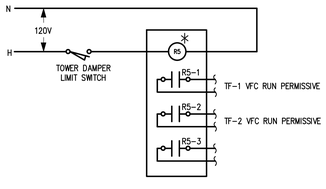
1. REFER TO COOLING TOWER SEQUENCE OF OPERATION FOR TOWER FAN CONTROL.
2. IF THE TOWER FAN VIBRATION SWITCH (BY MFR.) ACTIVATES, INTERLOCK WIRING SHALL ENERGIZE CONTROL RELAY.
3. CONTROL RELAY WIRING SHALL SHUTDOWN (RUN PERMISSIVE) THE RESPECTIVE VFC FOR THE TOWER FAN, PROVIDE AN ALARM TO THE BAS, AND TURN ON INDICATING LIGHT ON THE CONTROL PANEL DOOR.
4. WHEN VIBRATION SWITCH IS RESET AT THE TOWER, WIRING INTERLOCK SHALL ENABLE THE VFC (RUN PERMISSIVE, BAS ALARM SHALL RETURN TO NORMAL, AND TURN OFF INDICATING LIGHT ON THE CONTROL PANEL DOOR.
5. INTERLOCK WIRING WITH DDC DO POINT SHALL ENABLE AND DISABLE THE TOWER FAN MOTOR'S SPACE HEATER.



CT-1 TF-2 VIBRATION INTERLOCK WIRING

NOTES:

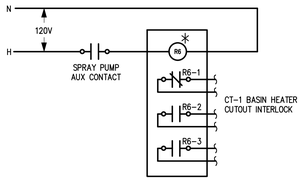
1. ✳ INDICATES PANEL MOUNTED COMPONENT. MOUNT RED INDICATING LIGHT ON PANEL DOOR.
2. ALL WORK SHOWN SHALL BE BY TEMPERATURE CONTROLS CONTRACTOR. PROVIDE CONTROL PANEL WITH NEMA RATING BASED ON PANEL LOCATION.
3. VIBRATION SWITCH IS FURNISHED AND MOUNTED AT TOWER FAN BY TOWER MFR.
4. RED INDICATING LIGHT, WIRING, AND CONTROL DEVICES (OTHER THAN VIBRATION SWITCH), SHALL BE INSTALLED IN TC AUX. PANEL BY TCC AND LABELED "TF-1 VIBRATION TRIP".



CT-1 TF-1/2 RUN PERMISSIVE CIRCUIT

NOTE:

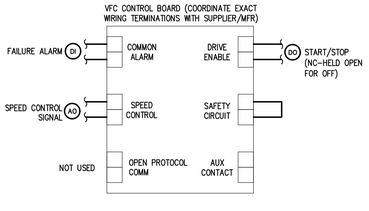
1. CONSULT WITH VFC SUPPLIER FOR THE WIRING REQUIREMENTS.



CT-1 BASIN HEATER CUTOUT CIRCUIT

NOTE:

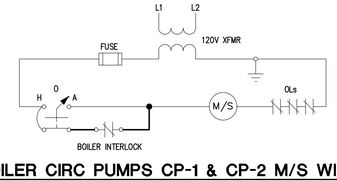
1. CONSULT WITH COOLING TOWER SUPPLIER FOR THE WIRING REQUIREMENTS.



HPL PUMPS CP-3 & CP-4 VFC WIRING

NOTES:

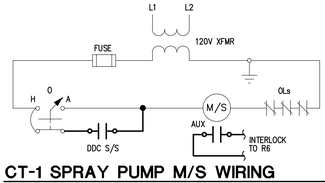
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.



BOILER CIRC PUMPS CP-1 & CP-2 M/S WIRING

NOTES:

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



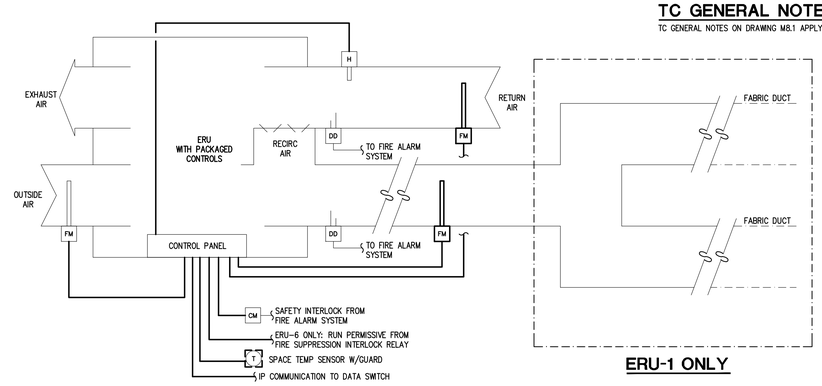
CT-1 SPRAY PUMP M/S WIRING

NOTES:

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

TC GENERAL NOTES

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



ERU-1 ONLY

SINGLE-ZONE VAV AHU CONTROLS

ERU-1 SERVES THE GYMNASIUM
ERU-4 SERVES DINING COMMONS
ERU-6 SERVES THE KITCHEN

NOTES:

1. ENERGY RECOVERY UNIT SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS FROM MANUFACTURER INCLUDING DDC CONTROLLER, IP BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, SPACE AND HUMIDITY SETPOINT ADJUSTMENT AND UNIT MONITORING.
2. TC CONTRACTOR SHALL INSTALL SPACE TEMPERATURE AND RETURN AIR DUCT HUMIDITY SENSORS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARDS FOR SPACE SENSORS. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.
3. TC CONTRACTOR SHALL MOUNT STATIC REFERENCE PROBES AS SHOWN ON DRAWINGS AND PROVIDE INSTRUMENT AIR TUBING TO THE STATIC PRESSURE TRANSMITTER PROVIDED BY THE UNIT MANUFACTURER AND LOCATED IN THE UNIT CONTROLS PANEL.
4. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM ERU CONTROL PANEL TO BAS NETWORK SUPERVISORY CONTROLLER.
5. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
6. ERU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR START-UP, PROGRAMMING, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.

SEQUENCE OF OPERATION

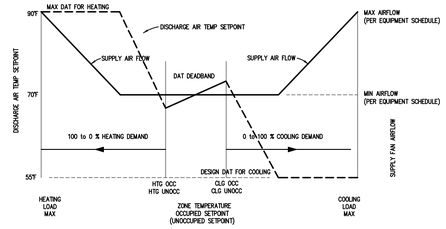
NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. ERU WITH PACKAGED CONTROLS SHALL PROVIDE SINGLE-ZONE VAV AHU CONTROL OF SPACE TEMPERATURE AND VOLUME BASED ON THE DIAGRAM HEREIN, DUAL ENTHALPY ECONOMIZER, MINIMUM OUTSIDE AIRFLOW CONTROL, HOT GAS REHEAT CONTROL FOR DEHUMIDIFICATION, HEAT RECOVERY WHEEL FROST PROTECTION CONTROL, AND OPTIMUM START/STOP CONTROL.
2. PACKAGED CONTROLS SHALL PREVENT SF AND EF FROM REDUCING BELOW THE RESPECTIVE FAN CURVE'S MINIMUM CFM.
3. FOR ERU-1: TAB CONTRACTOR SHALL PROVIDE SF AIRFLOW CFM LOW LIMIT SETPOINT TO PREVENT FABRIC DUCT FROM FLUTTERING. PACKAGED CONTROLS SHALL MAINTAIN CFM LOW LIMIT SETPOINT.
4. PACKAGED CONTROLS SHALL MONITOR AIRFLOW MEASURING DEVICES AND MODULATE EF VFC SPEED CONTROL TO PROVIDE EF CFM SETPOINT CONTROL THAT EQUALS SF ACTUAL AIRFLOW CFM MINUS AN OFFSET CFM AIRFLOW.
5. PACKAGED CONTROLS SHALL MODULATE MIXED AIR DAMPERS (OA & RECIRCULATION) TO MAINTAIN OA MINIMUM AIRFLOW CFM SETPOINT REGARDLESS OF SF AIRFLOW CFM.
6. BACnet COMMUNICATION INTERFACE BY MFR. SHALL ALLOW UNIT OCCUPIED/UNOCCUPIED SCHEDULING & TEMPERATURE SETPOINTS, FAN STATUSES, DAT & DUCT STATIC PRESSURE SETPOINT ADJUSTMENT, AND ADDITIONAL UNIT MONITORING AS AVAILABLE, FROM THE BAS.
7. IN OCCUPIED MODE, PACKAGED CONTROLLER SHALL RUN SF/EF CONTINUOUSLY AND PROVIDE HOT GAS REHEAT CONTROL FOR DEHUMIDIFICATION. DEHUMIDIFICATION SETPOINT SHALL BE 50% RH.
8. IN UNOCCUPIED MODE, PACKAGED CONTROLLER SHALL CYCLE SF ON/OFF WITH THE RECIRCULATION AIR DAMPER OPEN, EF IS OFF, AND OA DAMPER CLOSED.
9. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE UNIT THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
10. SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:

    HEATING UNOCCUPIED SETPOINT = 60°F
    HEATING OCCUPIED SETPOINT = 70°F
    COOLING OCCUPIED SETPOINT = 74°F
    COOLING UNOCCUPIED SETPOINT = 80°F

11. PACKAGED CONTROLLER SHALL COMMUNICATE, BUT NOT LIMITED TO, THE FOLLOWING POINTS AS AVAILABLE:

- OCCUPANCY MODE SCHEDULE (FROM BAS)
- EFFECTIVE OCCUPANCY MODE (TO BAS)
- OCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- OCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- SUPPLY FAN ON/OFF/ALARM STATUS (TO BAS)
- SUPPLY FAN VFC SPEED SETTING (TO BAS)
- SUPPLY FAN VFC ALARM (TO BAS)
- EXHAUST FAN ON/OFF/ALARM STATUS (TO BAS)
- EXHAUST FAN VFC SPEED SETTING (TO BAS)
- SUPPLY FAN VFC ALARM (TO BAS)
- OA DAMPER AIRFLOW SETPOINT (FROM BAS)
- OA DAMPER POSITION (%) (TO BAS)
- OA AIRFLOW AIRFLOW (TO BAS)
- SUPPLY AIRFLOW CFM (TO BAS)
- EXHAUST AIRFLOW CFM (TO BAS)
- EXHAUST FAN CFM OFFSET SETPOINT (TO BAS)
- DUCT STATIC PRESSURE LOW LIMIT SETPOINT (FROM BAS)
- DUCT STATIC PRESSURE "W.G. (TO BAS)
- DISCHARGE, SPACE, AND OUTSIDE AIR TEMPERATURE (TO BAS)
- ENERGY WHEEL STATUS (TO BAS)
- HEAT PUMP HEAT/COOL STATUS (TO BAS)
- ECONOMIZER MODE STATUS (TO BAS)
- DEHUMIDIFICATION SETPOINT (FROM BAS)
- DEHUMIDIFICATION MODE ACTIVE (TO BAS)
- DIRTY FILTER STATUSES/ALARMS (TO BAS)
- MISC UNIT TEMPERATURE MONITORING (TO BAS)
- TEMP SENSOR FAILURE ALARMS (TO BAS)
- UNIT SAFETY CUTOUT ALARMS (TO BAS)
- OTHER MISC ALARMS (TO BAS)
- ERU DIAGNOSTIC CODES (TO BAS)
- CONTROL SETPOINTS, DEADBANDS, & TIME DELAYS



ERU-1, 4, & 6 TEMPERATURE/AIRFLOW RESET SCHEDULE DIAGRAM

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PROJECT NO.

22102

DRAWING NO.

M8.3

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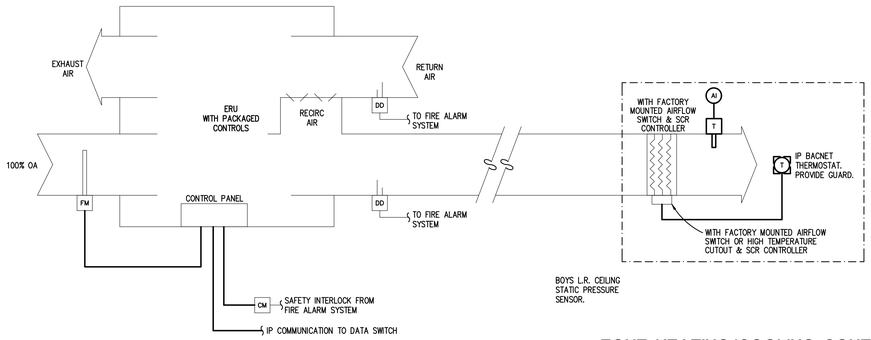


100% OA, CAV, AHU CONTROLS

ERU-7 SERVES THE LOCKER ROOMS

NOTES:

1. ENERGY RECOVERY UNIT SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS FROM MANUFACTURER INCLUDING DDC CONTROLLER, IP BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, SPACE TEMPERATURE SETPOINT ADJUSTMENT, AND UNIT MONITORING.
2. TC CONTRACTOR SHALL INSTALL "SHIPPED LOOSE" CONTROLS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARDS FOR SPACE SENSORS.
3. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM ERU CONTROL PANEL TO BAS NETWORK SUPERVISORY CONTROLLER.
4. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
5. ERU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR START-UP, PROGRAMMING, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.

SEQUENCE OF OPERATION

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

1. ERU WITH PACKAGED CONTROLS SHALL PROVIDE CONSTANT VOLUME CONTROL, 100% OUTSIDE AIR WITH RECIRCULATION DAMPER, MAINTAIN DISCHARGE AIR TEMPERATURE (DAT) SETPOINT, HEAT RECOVERY WHEEL CONTROL WITH FROST PROTECTION, AND OPTIMUM START/STOP CONTROL.
2. BACnet COMMUNICATION INTERFACE BY MFR. SHALL ALLOW UNIT OCCUPIED/UNOCCUPIED SCHEDULING & TEMPERATURE SETPOINTS, FAN STATUSES, DAT SETPOINT ADJUSTMENT, AND ADDITIONAL UNIT MONITORING AS AVAILABLE, FROM THE BAS.
3. PACKAGED CONTROLS SHALL MODULATE SF VFC SPEED CONTROL TO MAINTAIN THE TAB CONTRACTOR'S FINAL AIR BALANCE DATA. INITIAL SETPOINT SHALL BE 6400 CFM.
4. PACKAGED CONTROLS SHALL MODULATE EF VFC SPEED CONTROL BASED ON SF SPEED CONTROL TO MAINTAIN LOCKER ROOMS SLIGHTLY NEGATIVE. CONTRACTOR SHALL PROVIDE DATA AFTER FINAL BALANCE.
5. IN OCCUPIED MODE, PACKAGED CONTROLLER SHALL RUN SF/EF CONTINUOUSLY WITH THE RECIRCULATION AIR DAMPER CLOSED.
6. PACKAGED CONTROLS SHALL MODULATE OUTSIDE AIR DAMPER TO MAINTAIN OA MINIMUM AIRFLOW CFM SETPOINT REGARDLESS OF SF AIRFLOW CFM.
7. IN UNOCCUPIED MODE, PACKAGED CONTROLLER SHALL CYCLE SF ON/OFF WITH THE RECIRCULATION AIR DAMPER OPEN, EF IS OFF, OA DAMPER IS CLOSED, TO MAINTAIN UNOCCUPIED TEMPERATURE SETPOINTS FROM DDC.
8. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE UNIT THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
9. DAT SETPOINT SHALL BE BASED ON THE FOLLOWING OUTSIDE AIR TEMP RESET SCHEDULE:

OAT	DAT
≤ 30°F	60°F
≥ 55°F	55°F

10. PACKAGED CONTROLLER SHALL COMMUNICATE, BUT NOT LIMITED TO, THE FOLLOWING POINTS AS AVAILABLE:

- OCCUPANCY MODE SCHEDULE (FROM BAS)
- EFFECTIVE OCCUPANCY MODE (TO BAS)
- OCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- OCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- MINIMUM OUTSIDE AIR POSITION (TO BAS)
- SUPPLY FAN ON/OFF/ALARM STATUS (TO BAS)
- SUPPLY FAN VFC SPEED SETTING (TO BAS)
- SUPPLY FAN VFC ALARM (TO BAS)
- EXHAUST FAN ON/OFF/ALARM STATUS (TO BAS)
- EXHAUST FAN ECM SPEED SETTING (TO BAS)
- EXHAUST FAN VFC ALARM (TO BAS)
- SF/EF OFFSET CFM CONTROL (TO BAS)
- OUTSIDE AIR AIRFLOW CFM (TO BAS)
- DISCHARGE AND OUTSIDE AIR TEMPERATURE (TO BAS)
- HEAT PUMP HEAT/COOL STATUS (TO BAS)
- ENERGY WHEEL STATUS (TO BAS)
- DIRTY FILTER STATUSES/ALARMS (TO BAS)
- MISC UNIT TEMPERATURE MONITORING (TO BAS)
- TEMP SENSOR FAILURE ALARMS (TO BAS)
- UNIT SAFETY CUTOUT ALARMS (TO BAS)
- OTHER MISC ALARMS (TO BAS)
- ERU DIAGNOSTIC CODES (TO BAS)
- CONTROL SETPOINTS, DEADBANDS, & TIME DELAYS

ZONE HEATING/COOLING CONTROL

REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.

NOTES:

1. PROVIDE LINK ON BAS GRAPHIC FLOOR PLAN FOR ZONE OCC/UNOCC SCHEDULE.

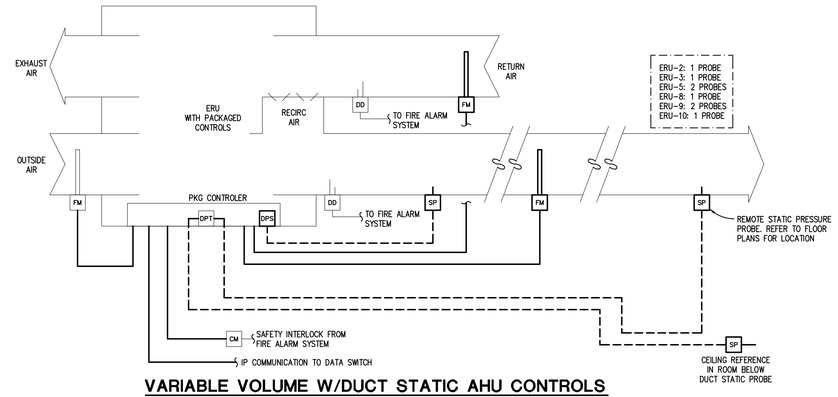
SEQUENCE OF OPERATION

1. BAS/DDC SHALL MAINTAIN ZONE OCCUPIED/UNOCCUPIED HEATING/COOLING SETPOINTS AND TIME OF DAY SCHEDULE. EACH ZONE SHALL HAVE UNIQUE SETPOINTS/TOD SCHEDULES.
2. DDC SHALL MODULATE ZONE ELECTRIC HEATING COIL SCR CONTROL TO MAINTAIN ZONE SUPPLY AIR TEMPERATURE SETPOINT THAT SHALL BE RESET BASED ON DEVIATION FROM RESPECTIVE ZONE SPACE TEMP SETPOINT (CASCADE CONTROL LOGIC). DDC SHALL SIGNAL THE ASSOCIATED ERU FOR NIGHT CYCLE MODE BASED ON WARMEST AND COLDEST ZONES.
3. DDC SHALL PROVIDE HIGH LIMIT SETPOINT CONTROL AT 90°F DAT AS SENSED BY ELECTRIC HEATING COIL DISCHARGE AIR TEMPERATURE SENSOR.
4. DDC SHALL SIGNAL ERU FOR UNOCCUPIED ON/OFF CYCLE BASED ON LOWEST SPACE TEMPERATURE FOR HEATING AND HIGHEST SPACE TEMPERATURE FOR COOING.
5. ZONE TEMPERATURE SETPOINTS SHALL BE:

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

TC GENERAL NOTES

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



VARIABLE VOLUME W/DUCT STATIC AHU CONTROLS

ERU-2, -8, -9, & -10 SERVES CLASSROOMS
ERU-3 SERVES MEDIA CENTER
ERU-5 SERVES OFFICES

NOTES:

1. ENERGY RECOVERY UNIT SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS FROM MANUFACTURER INCLUDING DDC CONTROLLER, IP BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, SPACE AND HUMIDITY SETPOINT ADJUSTMENT AND UNIT MONITORING.
2. TC CONTRACTOR SHALL INSTALL SHIPPED LOOSE CONTROLS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.
3. TC CONTRACTOR SHALL MOUNT STATIC REFERENCE PROBES AS SHOWN ON DRAWINGS AND PROVIDE INSTRUMENT AIR TUBING TO THE STATIC PRESSURE TRANSMITTER PROVIDED BY THE UNIT MANUFACTURER AND LOCATED IN THE UNIT CONTROLS PANEL. TC CONTRACTOR SHALL PROVIDE DPS.
4. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM ERU CONTROL PANEL TO BAS NETWORK SUPERVISORY CONTROLLER.
5. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
6. ERU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR START-UP, PROGRAMMING, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.

SEQUENCE OF OPERATION

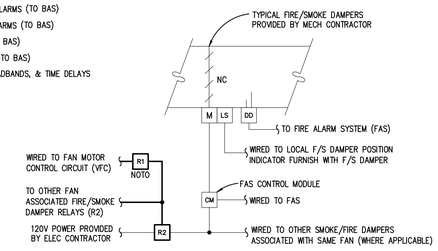
NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. ERU WITH PACKAGED CONTROLS SHALL PROVIDE VARIABLE AIR VOLUME CONTROL FROM DOWN-THE-DUCT STATIC PRESSURE PROBES (DPT), OUTSIDE AIR MINIMUM CFM CONTROL, MIXED AIR CONTROL WITH DUAL ENTHALPY ECONOMIZER, MAINTAIN DISCHARGE AIR TEMPERATURE (DAT) SETPOINT, HEAT RECOVERY WHEEL FROST PROTECTION CONTROL, AND OPTIMUM START/STOP CONTROL.
2. BACnet COMMUNICATION INTERFACE BY MFR. SHALL ALLOW UNIT OCCUPIED/UNOCCUPIED SCHEDULING & TEMPERATURE SETPOINTS, FAN STATUSES, DAT & SPACE STATIC PRESSURE SETPOINT ADJUSTMENT, AND ADDITIONAL UNIT MONITORING AS AVAILABLE, FROM THE BAS.
3. PACKAGED CONTROLS SHALL PREVENT SF AND EF FROM REDUCING BELOW THE RESPECTIVE FAN CURVE'S MINIMUM CFM.
4. PACKAGED CONTROLS SHALL MODULATE SF VFC SPEED CONTROL TO MAINTAIN DOWN-THE-DUCT STATIC PRESSURE SETPOINT THAT SHALL BE RESET BASED ON DAMPER POSITION FEEDBACK FROM ASSOCIATED VAV TERMINAL UNIT CONTROLLERS AS FOLLOWS: SETPOINT SHALL BE ADJUSTED TO ALLOW "N" SA TERMINAL UNITS TO OPERATE AT 90% OPEN DAMPER POSITION. BELOW "N" SA TERMINAL UNITS AT 90%, SETPOINT SHALL BE SLOWLY DECREASED. ABOVE "N" SA TERMINAL UNITS AT 90%, SETPOINT SHALL BE SLOWLY INCREASED. SETPOINT RANGE SHALL BE 0.5" W.G. TO 1.5" W.G. (BOTH ADJUSTABLE).
   - 4.1. FOR ERU-2: "N" SHALL BE 3.
   - 4.2. FOR ERU-3: "N" SHALL BE 2.
   - 4.3. FOR ERU-5: "N" SHALL BE 4.
   - 4.4. FOR ERU 8, -9, & -10: "N" SHALL BE 5.
5. ON ERU'S WITH TWO STATIC PRESSURE SENSORS, THE LOWEST READING STATIC PRESSURE SHALL CONTROL.
6. DISCHARGE AIR DIFFERENTIAL PRESSURE SWITCH SHALL PROVIDE HARDWIRED SAFETY (MANUALLY RESET) SHUTDOWN WITH SETPOINT OF 4.0" W.G. PACKAGED CONTROLS SHALL ACTIVATE ALARM IF IN SHUTDOWN.
7. PACKAGED CONTROLS SHALL MODULATE EF VFC SPEED CONTROL TO PROVIDE EF CFM SETPOINT CONTROL THAT EQUALS SF ACTUAL AIRFLOW CFM MINUS AN OFFSET CFM AIRFLOW MINUS TOILET EXHAUST CFM AIRFLOW.
8. PACKAGED CONTROLS SHALL MODULATE MIXED AIR DAMPERS (OA & RECIRCULATION) TO MAINTAIN OA MINIMUM AIRFLOW CFM SETPOINT REGARDLESS OF SF AIRFLOW CFM.
9. PACKAGED CONTROLLER SHALL RUN SF/EF CONTINUOUSLY IN OCCUPIED MODE WITH THE RECIRCULATION AIR DAMPER TO PROVIDE MIXED AIR CONTROL.
10. PACKAGED CONTROLLER SHALL CYCLE SF/EF ON/OFF IN UNOCCUPIED MODE WITH THE RECIRCULATION AIR DAMPER OPEN, USING SF ONLY, EF IS OFF, OA DAMPER IS CLOSED.
11. DAT SETPOINT SHALL BE BASED ON THE FOLLOWING OUTSIDE AIR TEMP RESET SCHEDULE:

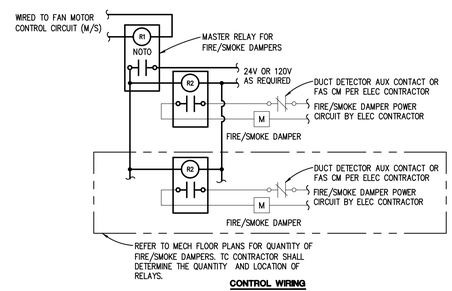
OAT	DAT
≤ 30°F	60°F
≥ 55°F	55°F

12. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE UNIT THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
13. PACKAGED CONTROLLER SHALL COMMUNICATE, BUT NOT LIMITED TO, THE FOLLOWING POINTS AS AVAILABLE:

- OCCUPANCY MODE SCHEDULE (FROM BAS)
- EFFECTIVE OCCUPANCY MODE (TO BAS)
- OCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- OCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- MINIMUM OUTSIDE AIR POSITION (TO BAS)
- SUPPLY FAN ON/OFF/ALARM STATUS (TO BAS)
- SUPPLY FAN VFC SPEED SETTING (TO BAS)
- SUPPLY FAN VFC ALARM (TO BAS)
- EXHAUST FAN ON/OFF/ALARM STATUS (TO BAS)
- EXHAUST FAN VFC SPEED SETTING (TO BAS)
- EXHAUST FAN VFC ALARM (TO BAS)
- OA AIRFLOW CFM (TO BAS)
- OA AIRFLOW SETPOINT (FROM BAS)
- OA DAMPER POSITION (%) (TO BAS)
- SA DISCHARGE AIR TEMPERATURE (TO BAS)
- SA DISCHARGE AIR TEMPERATURE SETPOINT (TO BAS)
- SUPPLY AIRFLOW CFM (TO BAS)
- EXHAUST AIRFLOW CFM (TO BAS)
- EXHAUST FAN CFM OFFSET SETPOINT (TO BAS)
- DISCHARGE AND OUTSIDE AIR TEMPERATURE (TO BAS)
- HEAT PUMP HEAT/COOL STATUS (TO BAS)
- ENERGY WHEEL STATUS (TO BAS)
- DIRTY FILTER STATUSES/ALARMS (TO BAS)
- MISC UNIT TEMPERATURE MONITORING (TO BAS)
- TEMP SENSOR FAILURE ALARMS (TO BAS)
- UNIT SAFETY CUTOUT ALARMS (TO BAS)
- OTHER MISC ALARMS (TO BAS)
- ERU DIAGNOSTIC CODES (TO BAS)
- CONTROL SETPOINTS, DEADBANDS, & TIME DELAYS



CONTROL SCHEMATIC



CONTROL WIRING

ERU-9 FAN FIRE/SMOKE DAMPER CONTROL DETAILS

NOTES:

1. REFER TO FLOOR PLANS FOR EXACT QUANTITIES & LOCATIONS OF FANS ASSOCIATED WITH FIRE/SMOKE DAMPERS.
2. ELECTRICAL CONTRACTOR SHALL PROVIDE 120V POWER REQUIREMENT FOR FIRE/SMOKE DAMPER ACTUATOR(S).
3. TC CONTRACTOR SHALL PROVIDE CONTROL RELAY IN ENCLOSURE FOR FIRE/SMOKE DAMPER CONTROL. IF MULTIPLE POWER CIRCUITS ARE USED FOR FIRE/SMOKE DAMPERS, MULTIPLE CONTROL RELAYS SHALL BE USED AND WIRED IN PARALLEL.

SEQUENCE OF OPERATION:

1. FIRE/SMOKE DAMPERS SHALL BE HARDWIRE INTERLOCKED TO RESPECTIVE FANS' CONTROLS AND SHALL OPEN WHEN RESPECTIVE FAN IS ACTIVATED AND CLOSE WHEN FAN IS DEACTIVATED.
2. WHEN PRODUCTS OF COMBUSTION ARE DETECTED AT DUCT SMOKE DETECTOR, FIRE ALARM SYSTEM SHALL CLOSE RESPECTIVE FIRE/SMOKE DAMPERS AND DEACTIVATE FAN.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DJT
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M8.4

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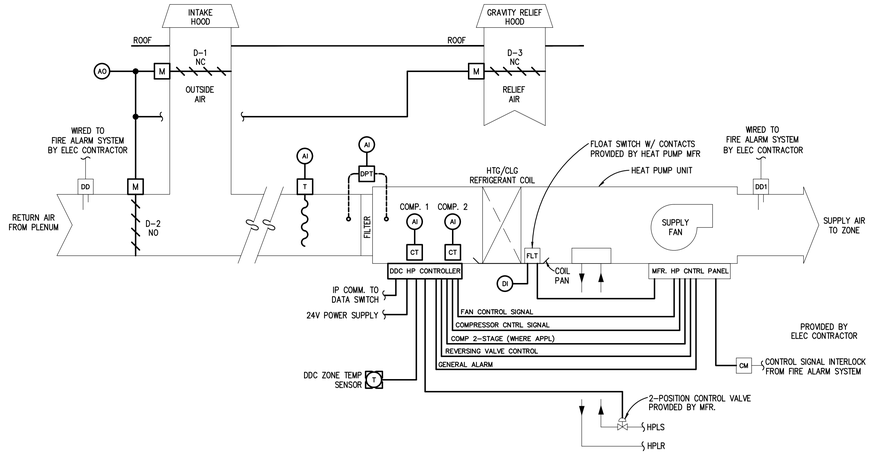
TC GENERAL NOTES

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



HEAT PUMP CONTROLS

HP-101 SERVES CORRIDOR A127 AND ASSOCIATED ROOMS
HP-102 SERVES THE SERVERY

NOTES:

1. REFER TO SHEET METAL PLANS FOR QUANTITY OF UNITS AND LOCATIONS OF ASSOCIATED HEAT PUMP (HP) ZONE TEMP SENSORS.
2. HP WATER SOURCE ISOLATION CONTROL VALVE SHALL BE FURNISHED BY HP UNIT SUPPLIER, INSTALLED BY MECHANICAL CONTRACTOR, AND WIRED TO DDC CONTROLS BY TC CONTRACTOR. COORDINATE CONTROL WIRING REQUIREMENTS AND TERMINATIONS WITH HEAT PUMP UNIT SUPPLIER.
3. HP IMMERSION TEMPERATURE SENSOR SHALL BE FURNISHED BY HP UNIT SUPPLIER, INSTALLED BY MECHANICAL CONTRACTOR, AND WIRED TO CONTROLS BY TC CONTRACTOR. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH HEAT PUMP UNIT SUPPLIER.
4. FOR INDIVIDUAL ZONE HEAT PUMPS THAT ARE 2000CFM AND HIGHER OR WHERE A ZONE IS FED FROM MULTIPLE HEAT PUMPS THAT TOTAL 2000 CFM AND HIGHER: ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS (CM) AND WIRING FROM FIRE ALARM SYSTEM TO HEAT PUMP CONTROLS. TC CONTRACTOR SHALL PROVIDE WIRING FROM CM TO UNIT CONTROL FOR SHUTDOWN.
5. TC CONTRACTOR SHALL PROVIDE BACnet IP DDC CONTROLLER AND COMM. INTERFACE WIRING TO THE BAS NETWORK.
6. TC CONTRACTOR SHALL PROVIDE COMPONENTS AND FIELD WIRING FOR COIL CONDENSATE HIGH LEVEL CUT-OUT AND REMOTE ALARM MONITORING BY DDC.
7. TC CONTRACTOR SHALL PROVIDE DAMPERS/ECONOMIZER CONTROLS THRU DDC.
8. HEAT PUMP SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR START-UP, PROGRAMMING, AND WIRING COORDINATION WITH TC CONTRACTOR.

SEQUENCE OF OPERATION

HEAT PUMP UNIT CONTROL:

NOTES:

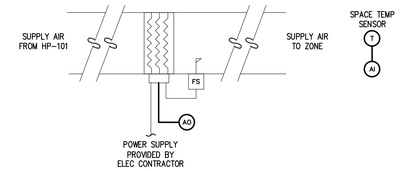
1. HEAT PUMP (HP) UNIT SHALL INCLUDE PACKAGED CONTROLLER FOR REFRIGERANT SAEFTIES AND INTERFACE WIRING.
2. ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, MODE POINTS, ETC., INCLUDING TIME-OF-DAY HOURS OF OPERATION AND SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY BAS OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. HPC PROGRAMMING SHALL PREVENT "LOOP WINDUP".

SEQUENCE OF OPERATION:

1. HEAT PUMP UNIT SHALL HAVE START/STOP CAPABILITY FROM THE HPC CONTROLLER (HPC) WITH ZONE TEMPERATURE SENSOR PROVIDING SYSTEM OVERRIDES, ALARMS, AND SYSTEM MONITORING. HEAT PUMP SHALL OPERATE BASED ON TIME OF DAY SCHEDULED OCCUPIED MODE AND UNOCCUPIED CYCLE MODE. HP-102 ZONE TEMPERATURESENSOR SHALL ALLOW 1-HR. OVERRIDE CONTROL FROM PUSHBUTTON.
2. HPC SHALL DEACTIVATE THE COMPRESSOR CONTROLS IF WATER TEMPERATURE IS NOT APPROPRIATE FOR A TWO MINUTE DELAY TO PREVENT LOCAL SAFETY CUTOUT FROM OCCURRING.
3. HPC SHALL NOT ALLOW DISCHARGE AIR TEMPERATURE TO EXCEED 90°F SETPOINT AND NOT DECREASE BELOW 55°F SETPOINT.
4. DURING BUILDING OCCUPANCY, HP FAN SHALL OPERATE CONTINUOUSLY, HPC SHALL COMMAND THE ASSOCIATED MIXED AIR DAMPERS TO MAINTAIN SCHEDULED OUTSIDE AIRFLOW.
5. DURING BUILDING UNOCCUPANCY, HP FAN SHALL BE CYCLED ON & OFF TO MAINTAIN UNOCCUPIED MODE ZONE TEMPERATURE SETPOINTS. ASSOCIATED OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED WITH RETURN DAMPER IN FULL AIR RECIRCULATION POSITION.
6. HP-101 AND HP-102: WHEN ZONE TEMPERATURE RISES ABOVE COOLING SETPOINT, THE HPC HP CONTROLLER SHALL SWITCH REVERSING VALVE TO COOLING MODE, OPEN WATER SOURCE HP LOOP VALVE AND ACTIVATE COMPRESSOR (2-STAGES WHERE APPLICABLE) TO ACHIEVE ZONE TEMPERATURE COOLING SETPOINT.
7. HP-101 ONLY: WHEN ZONE TEMPERATURE FALLS BELOW HEATING SETPOINT, THE HPC HP CONTROLLER SHALL CLOSE THE WATER SOURCE HP LOOP VALVE AND DEACTIVATE COMPRESSOR (2-STAGES WHERE APPLICABLE), AND MODULATE THE ELECTRIC HEATING COIL CONTROL (SCR) TO ACHIEVE ZONE TEMPERATURE HEATING SETPOINT. HPC HP CONTROLLER SHALL **NOT** SWITCH REVERSING VALVE TO HEATING MODE.
7. HP-102 ONLY: WHEN ZONE TEMPERATURE FALLS BELOW HEATING SETPOINT, THE HPC HP CONTROLLER SHALL SWITCH REVERSING VALVE TO HEATING MODE, OPEN WATER SOURCE HP LOOP VALVE AND ACTIVATE COMPRESSOR (2-STAGES WHERE APPLICABLE) TO ACHIEVE ZONE TEMPERATURE HEATING SETPOINT.
8. CONDENSATE PAN FLOAT SWITCH, UPON HIGH LEVEL, SHALL DEACTIVATE HP COOLING CONTROL AND HPC SHALL PROVIDE THE BAS WITH AN ALARM.
9. HPC SHALL OVERRIDE COMPRESSOR AS REQUIRED TO PREVENT DISCHARGE AIR TEMPERATURE FROM DROPPING BELOW LOW LIMIT SETPOINT OF 52°F.
10. HPC SHALL MONITOR GENERAL ALARM FROM HEAT PUMP CONTROL.
11. WHEN HEAT PUMP IS DEACTIVATED, THE WATER SOURCE HEAT PUMP LOOP VALVE SHALL REMAIN CLOSED.

MIXED AIR DAMPERS CONTROL:

12. WHEN THE HEAT PUMP BACNET STATUS INDICATES UNIT IS RUNNING, HPC SHALL OPEN THE DAMPERS TO THE MINIMUM AIR CFM POSITION.
13. HPC SHALL PROVIDE DRY BULB ECONOMIZER CONTROL WHEN OA TEMPERATURE IS 55°F OR LESS. HPC SHALL MODULATE THE DAMPERS TO MAINTAIN 55°F MIXED AIR TEMPERATURE SETPOINT.
14. WHEN THE HEAT PUMP'S BACNET STATUS INDICATES THE UNIT IS OFF, HPC SHALL CLOSE THE DAMPERS TO OUTSIDE AIR. IN UNOCCUPIED CYCLE MODE, HPC SHALL CLOSE THE DAMPERS TO OUTSIDE AIR.
15. IF CONDENSATE PAN FLOAT REACHES HIGH LEVEL, THE HEAT PUMP SHALL BE DEACTIVATED AND HPC SHALL PROVIDE THE BAS WITH AN ALARM.
16. HPC SHALL MONITOR COMPRESSOR(S) CURRENT FOR BAS DIAGNOSTIC DISPLAY. HPC SHALL NOT ALLOW COMPRESSORS TO OPERATE ABOVE MAX. DESIGN CURRENT DRAW.
17. ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:
    - HEATING UNOCCUPIED SETPOINT = 62°F
    - HEATING OCCUPIED SETPOINT = 70°F
    - COOLING OCCUPIED SETPOINT = 75°F
    - COOLING UNOCCUPIED SETPOINT = 80°F
18. BAS OPERATOR SHALL HAVE THE ABILITY TO GLOBALLY MODIFY SETPOINTS.
19. FILTER STATUSES SHALL BE MONITORED BY HPC THRU RESPECTIVE DIFFERENTIAL PRESSURE (DP) TRANSMITTER (DPT). WHEN EACH FILTER'S DP REACHES DP SET POINT MINUS 0.2" W.G., HPC SHALL PROVIDE LOADED FILTER WARNING TO BAS. WHEN EACH FILTER'S DP REACHES DP SET POINT, HPC SHALL PROVIDE DIRTY FILTER ALARM TO BAS. INITIAL DP SET POINT SHALL BE 1.0 INCH W.G. EMCS CONTRACTOR SHALL ADJUST DPT BASED ON MANUFACTURER'S LOADED FILTER DATA.



HP-101 ELECTRIC HEATING COIL CONTROL

TYPICAL WHERE SHOWN FOR SPACES WITH A DUCT-MOUNTED ELECTRIC (EC) HEATING COIL

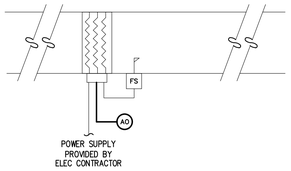
NOTES:

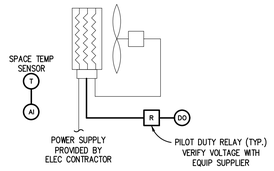
1. REFER TO FLOOR PLANS FOR LOCATION OF UNITS. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER.
2. ELECTRIC HEAT COILS SHALL BE PROVIDED WITH SCR CONTROL AND OVER-TEMP OR AIRFLOW CUT-OUT DEVICES BY THE MFR.

SEQUENCE OF OPERATION

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

1. EC SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. EC SHALL OPERATE BASED ON BAS TIME OF DAY SCHEDULED OCCUPIED MODE AND UNOCCUPIED MODE.
2. DDC SHALL MONITOR SPACE TEMPERATURE SENSOR AND MODULATE THE EC CONTROL CIRCUIT TO MAINTAIN SPACE TEMPERATURE SETPOINTS.
3. ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:
    - HEATING UNOCCUPIED SETPOINT = 62°F
    - HEATING OCCUPIED SETPOINT = 70°F
    - COOLING OCCUPIED SETPOINT = 75°F
    - COOLING UNOCCUPIED SETPOINT = 80°F
4. DDC SHALL PROVIDE A 2°F DEADBAND FOR CONTROL.





EUH/EC HEATING CONTROL

TYPICAL WHERE SHOW FOR SPACES WITH AN ELECTRIC UNIT HEATER AND DUCT-MOUNTED ELECTRIC HEATING COIL

NOTES:

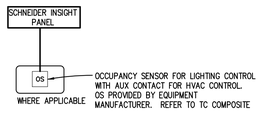
1. REFER TO FLOOR PLANS FOR LOCATION OF UNITS. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER.
2. ELECTRIC HEAT COILS SHALL BE PROVIDED WITH SCR CONTROL AND OVER-TEMP OR AIRFLOW CUT-OUT DEVICES BY THE MFR.

SEQUENCE OF OPERATION

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

1. EUH/EC SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. EC/EUH SHALL OPERATE BASED ON BAS TIME OF DAY SCHEDULED OCCUPIED MODE AND UNOCCUPIED MODE.
2. IN OCCUPIED MODE, DDC SHALL MONITOR SPACE TEMPERATURE SENSOR AND MODULATE THE EC CONTROL CIRCUIT TO MAINTAIN SPACE TEMPERATURE SETPOINTS AS FIRST STAGE OF HEAT. IF REQUIRED, DDC SHALL CYCLE EUH ON/OFF AS 2ND STAGE OF HEAT TO MAINTAIN SPACE TEMPERATURE SETPOINTS.
3. IN UNOCCUPIED MODE, DDC SHALL MONITOR SPACE TEMPERATURE SENSOR AND CYCLE EUH ON/OFF TO MAINTAIN SPACE TEMPERATURE SETPOINTS.
4. ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:
    - HEATING UNOCCUPIED SETPOINT = 62°F
    - HEATING OCCUPIED SETPOINT = 70°F
    - COOLING OCCUPIED SETPOINT = 75°F
    - COOLING UNOCCUPIED SETPOINT = 80°F
5. DDC SHALL PROVIDE A 2°F DEADBAND FOR CONTROL.

4



SCHNEIDER LIGHTING CONTROL

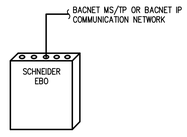
TYPICAL:

NOTES:

1. TC CONTRACTOR SHALL WIRE SCHNEIDER INSIGHT CONTROLLER TO ROOM OCCUPANCY SENSOR(S) WITH AUXILIARY CONTACTS AS PROVIDED BY EQUIPMENT MANUFACTURE. REFER TO SCHNEIDERL LIGHTING FLOOR PLANS FOR OCCUPANCY SENSOR APPLICATIONS AND LOCATIONS AND REFER TO SHEET TO TC COMPOSITE PLANS FOR ASSOCIATED AREAS SERVED BY LIGHTING CONTROL PANEL. COORDINATE WIRING REQUIREMENTS WITH SCHNEIDER CONTRACTOR.

SEQUENCE OF OPERATION:

1. WHEN ZONE IS UNOCCUPIED DURING SCHEDULED OCCUPIED MODE AS DETERMINED BY MONITORING THE LIGHTING OCCUPANCY SENSOR AUX CONTACTS, LIGHTS SHALL TURN OFF.



BAS LIGHTING CONTROL

TYPICAL:

NOTES:

1. TC CONTRACTOR SHALL WIRE SCHNEIDER INSIGHT CONTROLLER TO ROOM OCCUPANCY SENSOR(S) WITH AUXILIARY CONTACTS AS PROVIDED BY EQUIPMENT MANUFACTURE. REFER TO SCHNEIDER LIGHTING FLOOR PLANS FOR OCCUPANCY SENSOR APPLICATIONS AND LOCATIONS AND REFER TO SHEET TO TC COMPOSITE PLANS FOR ASSOCIATED AREAS SERVED BY LIGHTING CONTROL PANEL. COORDINATE WIRING REQUIREMENTS WITH SCHNEIDER CONTRACTOR.

SEQUENCE OF OPERATION:

1. WHEN ZONE IS UNOCCUPIED DURING SCHEDULED OCCUPIED MODE AS DETERMINED BY MONITORING THE LIGHTING OCCUPANCY SENSOR AUX CONTACTS, LIGHTS SHALL TURN OFF.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
07-23-2024	ADDENDUM #4
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DJT
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

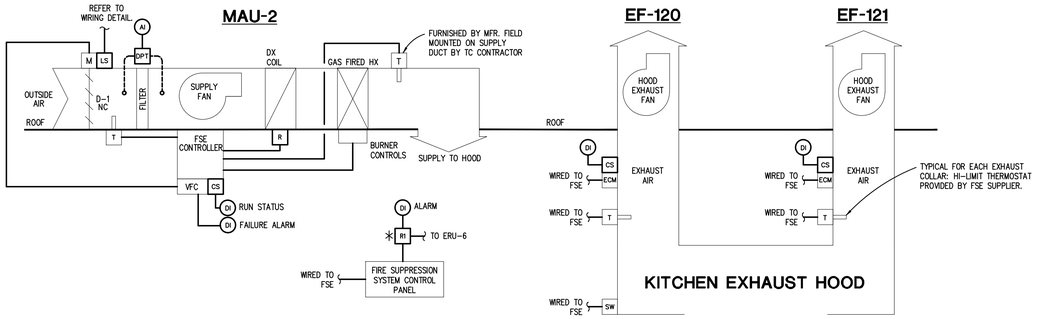
DRAWING NO.

M8.5

g:\2023\2023-0154-00\CAD\2023-0154-M8-CP.dwg, M8.5, 7/22/2024 4:45:15 PM, William T. Fulton, None ,0.09448, Peter Basso Associates Inc.

TC GENERAL NOTES

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



MAU-2 AND KITCHEN EXHAUST CONTROL

NOTES:

1. ✳ INDICATES TEMPERATURE CONTROL PANEL MOUNTED COMPONENT.
2. BASIS OF DESIGN IS CAPTIVEAIRE (FSE) FURNISHING THE MAU AND HOOD EXHAUST FANS. COORDINATE WIRING WITH EQUIPMENT SUPPLIERS.
3. FOOD SERVICE EQUIPMENT SUPPLIER (FSE) SHALL FURNISH AND INSTALL IMC COMPLIANT HOOD COLLAR TEMPERATURE INTERLOCK THERMOSTATS.
4. TAB CONTRACTOR SHALL PROVIDE ALL FAN SETTINGS AFTER FINAL BALANCE IS PERFORMED.
5. FSE SUPPLIED CONTROLLER SHALL OPERATE HOOD LIGHTS AND SHUTDOWN ELECTRICAL POWER TO COOKING DEVICES AND CLOSE KITCHEN GAS VALVE DURING A FIRE SUPPRESSION EVENT.

SEQUENCE OF OPERATION

MAU-2 AND KITCHEN EXHAUST FANS CONTROL:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, AND TIME DELAYS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

UNOCCUPIED MODE:

1. REFER TO EF-122 DETAIL FOR CONTROL.
2. ERU-6 NIGHT CYCLES FOR KITCHEN UNOCCUPIED SETPOINTS BY DDC/BAS.
3. FSE CONTROLLER OPERATED GREASE MAU-2 AND HOOD FANS EF-120 AND EF-121 AND SHALL BE OFF AND ONLY RUN FROM THE HOOD CONTROL SWITCH OR EITHER OF THE HIGH LIMIT THERMOSTATS. REFER TO "COOKING MODE" HEREIN.
4. IF GREASE HOOD EXHAUST IS MANUALLY ACTIVATED BY HOOD CONTROL SWITCH OR EITHER OF THE HOOD COLLAR HIGH LIMIT THERMOSTATS SENSE A HOOD TEMPERATURE HIGHER THAN 85°F SETPOINT (ADJ. AT DEVICE), WIRING INTERLOCKS TO FSE CONTROLLER SHALL ACTIVATE MAU-2, EF-120, AND EF-121. DDC SHALL SENSE RUNNING STATUSES VIA CURRENT SWITCHES. FSE CONTROLLER SHALL PROVIDE ALL OTHER CONTROL NEEDS FOR THE SYSTEM.
5. WHEN THE HOOD SWITCH IS OFF AND BOTH HOOD COLLAR HIGH LIMIT THERMOSTATS SENSE LOWER THAN SETPOINT, FSE CONTROLLER WIRING INTERLOCKS SHALL DEACTIVATE MAU-2, EF-120, AND EF-121.

OCCUPIED MODE (NO GREASE HOOD OPERATION):

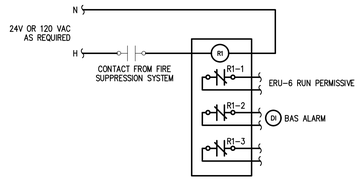
6. REFER TO EF-122 DETAIL FOR CONTROL.
7. ERU-6 RUNS FOR KITCHEN OCCUPIED SETPOINTS BY DDC/BAS.
8. MAU-2, EF-120, AND EF-121 SHALL REMAIN OFF UNTIL ACTIVATED BY LOCAL HOOD CONTROL SWITCH OR EITHER OF THE HOOD COLLAR HIGH LIMIT THERMOSTATS THRU FSE CONTROLLER.

OCCUPIED MODE (COOKING MODE):

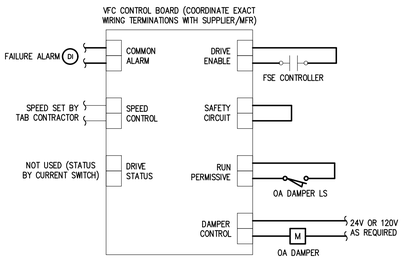
9. REFER TO EF-122 DETAIL FOR CONTROL.
10. ERU-6 RUNS FOR KITCHEN OCCUPIED SETPOINTS BY DDC/BAS.
11. WHEN GREASE HOOD EXHAUST FAN HOOD CONTROL SWITCH IS ACTIVATED OR EITHER OF THE HOOD HIGH LIMIT THERMOSTATS SENSE A HOOD COLLAR TEMPERATURE HIGHER THAN SETPOINT, FSE WIRING INTERLOCKS SHALL ACTIVATE MAU-2, EF-120, AND EF-121. FSE CONTROLLER SHALL PROVIDE ALL OTHER CONTROL NEEDS FOR THE SYSTEM.
12. MAU-2 OUTSIDE AIR DAMPER LIMIT SWITCH SHALL ALLOW MAU-2 TO RUN. FSE CONTROLLER SHALL CONTROL MAU-2 DISCHARGE AIR TEMPERATURE AND MAU-2, EF-120, AND EF-121 FAN SPEEDS.

GENERAL CONDITIONS:

13. IN ALL MODES OF OPERATION, MAU-2 SUPPLY FAN AND EF-120 AND EF-121 STATUSES SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCHES. ABNORMAL STATUS CONDITIONS SHALL ACTIVATE ALARMS.
14. DDC SHALL MONITOR RELAY R-1 FOR BAS DISPLAY AND ALARMING.
15. IF MAU-2 OR EF-120 OR EF-121 ARE RUNNING BETWEEN 11PM AND 5AM, DDC SHALL PROVIDE THE BAS WITH AN ALARM.
16. DDC SHALL TOTALIZE MAU-2, EF-120, AND EF-121 FAN MOTOR RUN TIME HOURS OF OPERATION FOR BAS DISPLAY.
17. MAU-2 SF VFC COMMON FAILURE ALARM SHALL BE MONITORED BY DDC THRU AVAILABLE CONTACTS AT RESPECTIVE FAN VFC.
18. IF THE FIRE SUPPRESSION SYSTEM IS ACTIVATED, ERU-6 SHALL BE DEACTIVATED VIA INTERLOCK RELAY R-1 AND INTERLOCK WIRING. DDC SHALL ACTIVATE AN ALARM TO THE BAS.



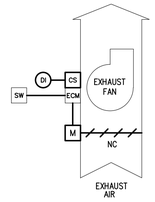
FIRE SUPPRESSION SYSTEM INTERLOCK WIRING



MAU-2 SF VFC WIRING

NOTES:

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



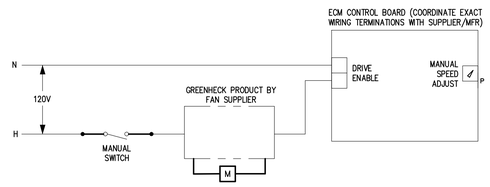
DISHWASHER EF-122 CONTROL

NOTES:

1. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER.
2. TAB CONTRACTOR SHALL MANUALLY SET EXHAUST FAN SPEED AFTER FINAL AIR BALANCE.
3. MOUNT CURRENT SWITCH ON MOTOR LEADS.

SEQUENCE OF OPERATION:

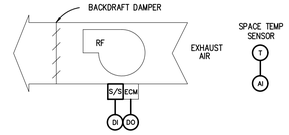
1. DISHWASHER EXHAUST FAN SHALL OPERATE FROM MFR PROVIDE SWITCH LOCATED ON OR NEAR THE DISHWASHER.
2. IF EF-122 IS RUNNING BETWEEN 11PM AND 5AM, DDC SHALL PROVIDE THE BAS WITH AN ALARM.
3. DDC SHALL TOTALIZE RUN TIME HOURS OF OPERATION FOR BAS DISPLAY.



BASIS OF DESIGN: GREENHECK ECM WIRING

NOTE:

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



RF TRANSFER FAN CONTROL

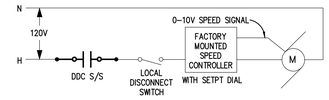
TYPICAL

NOTES:

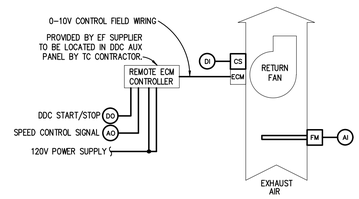
1. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER.
2. TAB CONTRACTOR SHALL MANUALLY SET FAN SPEED AFTER FINAL AIR BALANCE.
3. MOUNT CURRENT SWITCH ON MOTOR LEADS.
4. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS AND QUANTITIES.

SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL BE STARTED AND STOPPED BASED ON ROOM TEMPERATURE SENSOR TO MAINTAIN 75°F SETPOINT.
2. DDC SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. ABNORMAL CONDITION SHALL PROVIDE AN ALARM TO THE BAS.



RF FAN ECM CONTROL WIRING

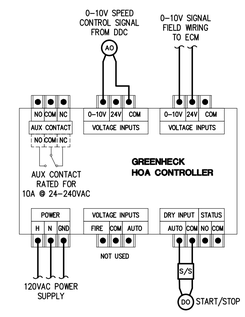


RF-101 & RF-102 CONTROL

RF-101/FPB-101/TU-124/TU-126 AND RF-102/FPB-102/TU-125/TU-127

SEQUENCE OF OPERATION:

1. RETURN AIR FAN SHALL BE STARTED AND AND STOPPED BY THE ERU BAS SCHEDULED OCCUPANCY AS ASSOCIATED WITH THE FAN POWERED TERMINAL UNIT FOR THE SPACE.
2. DDC SHALL MONITOR THE DUCT-MOUNTED AIRFLOW MEASURING DEVICE.
3. UPON OCCUPANCY START, DDC SHALL COMMAND THE RETURN FAN ECM SPEED SIGNAL BASED ON SUMMING THE ASSOCIATED TERMINAL UNITS' AIRFLOWS MINUS 100 CFM FOR SPACE PRESSURIZATION.
4. DDC SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. ABNORMAL OPERATION SHALL RESULT IN AN ALARM TO THE BAS. DDC SHALL TOTALIZE FAN MOTOR RUNTIME HOURS OF OPERATION.



RF-101 & RF-102 FAN REMOTE ECM CONTROLLER WIRING

TYPICAL

NOTE:

1. BASIS OF DESIGN GREENHECK: REMOTE ECM CONTROLLER TO BE FURNISHED BY EF SUPPLIER. TC CONTRACTOR SHALL INSTALL CONTROLLER IN DDC AUXILIARY ENCLOSURE AND PROVIDE ALL INDICATED FIELD WIRING.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DJT
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M8.6

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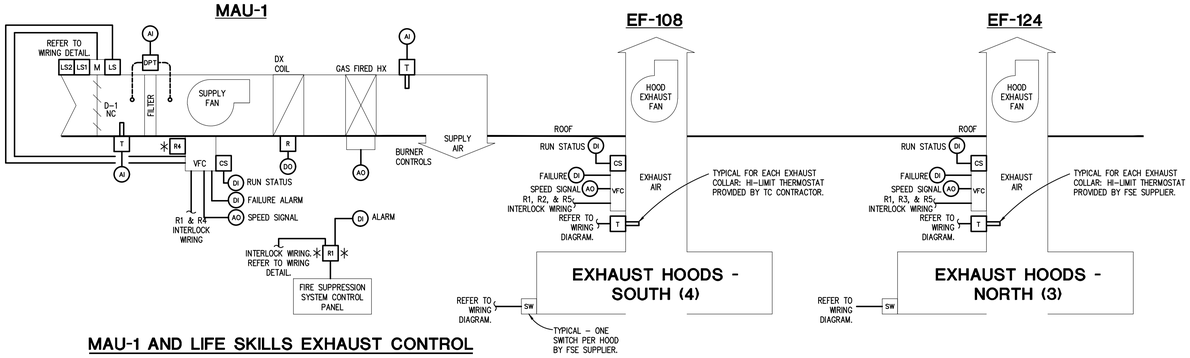


MAU-1 AND LIFE SKILLS EXHAUST CONTROL

NOTES:

1. ✳ INDICATES TEMPERATURE CONTROL PANEL MOUNTED COMPONENT.
2. COORDINATE WIRING WITH EQUIPMENT SUPPLIERS.
3. TC CONTRACTOR SHALL FURNISH AND INSTALL IMC 2009 COMPLIANT HOOD COLLAR TEMPERATURE INTERLOCK (THERMOSTAT).
4. TAB CONTRACTOR SHALL PROVIDE ALL FAN SETTINGS AFTER FINAL BALANCE IS PERFORMED.
5. FSE SUPPLIED CONTROLLER SHALL OPERATE HOOD LIGHTS AND SHUTDOWN ELECTRICAL POWER TO COOKING DEVICES DURING A FIRE SUPPRESSION EVENT.

SEQUENCE OF OPERATION

MAU-1 AND LIFE SKILLS EXHAUST FANS CONTROL:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, AND TIME DELAYS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

UNOCCUPIED MODE:

1. REFER TO SUPPLY AIR TERMINAL UNIT CONTROL DETAIL. TU-123 NIGHT CYCLES FOR LIFE SKILLS UNOCCUPIED SETPOINTS.
2. GREASE HOOD FAN EF-108 AND EF-124 SHALL BE OFF AND ONLY RUN FROM THE GREASE HOOD CONTROL SWITCH OR THE GREASE HOOD HIGH LIMIT THERMOSTAT, REFER TO "COOKING MODE" HEREIN.
3. IF MAU-1 IS ACTIVATED, OA DAMPER SHALL OPEN VIA INTERLOCK WIRING AND DDC SHALL PROVIDE SUPPLY FAN VFC CONTROL, HEATING CONTROL, AND COOLING CONTROL.
4. NORTH GREASE HOODS (ONLY) EF-124/MAU-1 OPERATION: IF ANY OF THE NORTH GREASE HOODS ARE MANUALLY ACTIVATED BY GREASE HOOD CONTROL SWITCHES OR THE GREASE HOOD COLLAR HIGH LIMIT THERMOSTATS SENSE A GREASE HOOD TEMPERATURE HIGHER THAN 85°F SETPOINT (ADJ. AT DEVICE), WIRING INTERLOCKS SHALL ACTIVATE MAU-1 AND EF-124. DDC SHALL SENSE RUNNING STATUSES VIA CURRENT SWITCHES. DDC SHALL MODULATE MAU-1 VFC AND EF-124 ECM SPEED SIGNALS TO PROVIDE THE TAB CONTRACTOR'S REPORTED NORTH GREASE HOODS (ONLY) AIRFLOW SETTING AFTER FINAL AIR BALANCE.
   - 4.1. MAU-1 DDC SHALL PROVIDE DISCHARGE AIR TEMPERATURE CONTROL AT 72°F SETPOINT (NEUTRAL).
   - 4.2. WHEN ALL NORTH FTR GREASE HOOD SWITCHES ARE OFF AND ALL RESPECTIVE HOOD COLLAR HIGH LIMIT THERMOSTATS SENSE LOWER THAN SETPOINT, WIRING INTERLOCKS SHALL DEACTIVATE MAU-1 AND EF-124.
5. SOUTH GREASE HOODS (ONLY) EF-108/MAU-1 OPERATION: IF ANY OF THE SOUTH GREASE HOOD IS MANUALLY ACTIVATED BY GREASE HOOD CONTROL SWITCHES OR THE GREASE HOOD COLLAR HIGH LIMIT THERMOSTATS SENSE A GREASE HOOD TEMPERATURE HIGHER THAN 85°F SETPOINT (ADJ. AT DEVICE), WIRING INTERLOCKS SHALL ACTIVATE MAU-1 AND EF-108. DDC SHALL SENSE RUNNING STATUSES VIA CURRENT SWITCHES. DDC SHALL MODULATE MAU-1 VFC AND EF-108 ECM SPEED SIGNALS TO PROVIDE THE TAB CONTRACTOR'S REPORTED SOUTH GREASE HOODS (ONLY) AIRFLOW SETTING AFTER FINAL AIR BALANCE.
   - 5.1. MAU-1 DDC SHALL PROVIDE DISCHARGE AIR TEMPERATURE CONTROL AT 72°F SETPOINT (NEUTRAL).
   - 5.2. WHEN ALL SOUTH GREASE HOOD SWITCHES ARE OFF AND ALL RESPECTIVE GREASE HOOD COLLAR HIGH LIMIT THERMOSTATS SENSE LOWER THAN SETPOINT, WIRING INTERLOCKS SHALL DEACTIVATE MAU-1 AND EF-108.
6. NORTH AND SOUTH GREASE HOODS EF-108/EF-124/MAU-1 OPERATION: IF ANY ONE OF THE NORTH GREASE HOODS AND ANY ONE OF THE SOUTH GREASE HOODS ARE MANUALLY ACTIVATED BY A GREASE HOOD CONTROL SWITCH OR THE GREASE HOOD COLLAR HIGH LIMIT THERMOSTAT SENSES A HOOD TEMPERATURE HIGHER THAN 85°F SETPOINT (ADJ. AT DEVICE), WIRING INTERLOCKS SHALL ACTIVATE MAU-1, EF-108, AND EF-124. DDC SHALL SENSE RUNNING STATUSES VIA CURRENT SWITCHES. DDC SHALL MODULATE MAU-1 VFC, AND EF-108/EF-124 ECM SPEED SIGNALS TO PROVIDE THE TAB CONTRACTOR'S REPORTED (NORTH AND SOUTH) GREASE HOODS AIRFLOW SETTINGS AFTER FINAL AIR BALANCE.
   - 6.1. MAU-1 DDC SHALL PROVIDE DISCHARGE AIR TEMPERATURE CONTROL AT 72°F SETPOINT (NEUTRAL).
   - 6.2. IF NORTH HOODS ARE OFF VIA SWITCHES AND THERMOSTATS, THEN SOUTH HOODS SHALL REMAIN RUNNING. DDC SHALL MODULATE MAU-1 VFC FOR SOUTH ONLY AIRFLOW AND WIRING INTERLOCKS DEACTIVATES EF-124.
   - 6.3. IF SOUTH HOODS ARE OFF VIA SWITCHES AND THERMOSTATS, THEN NORTH HOODS SHALL REMAIN RUNNING. DDC SHALL MODULATE MAU-1 VFC FOR NORTH ONLY AIRFLOW AND WIRING INTERLOCKS DEACTIVATES EF-108.
   - 6.4. WHEN ALL NORTH AND SOUTH HOOD SWITCHES ARE OFF AND ALL RESPECTIVE HOOD COLLAR HIGH LIMIT THERMOSTATS SENSE LOWER THAN SETPOINT, WIRING INTERLOCKS SHALL DEACTIVATE MAU-1, EF-108, AND EF-124.

OCCUPIED MODE (NO GREASE HOOD OPERATION):

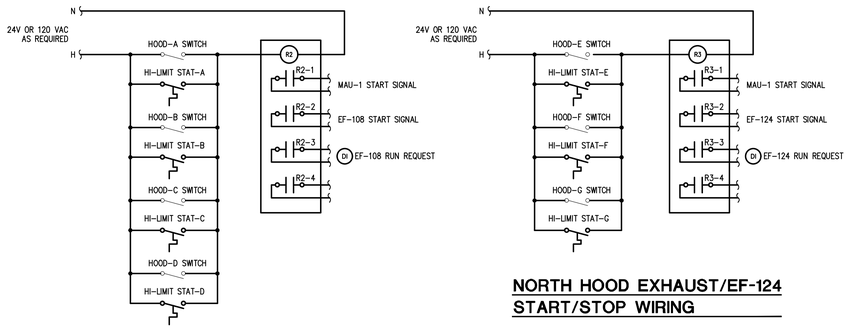
7. REFER TO SUPPLY AIR TERMINAL UNIT CONTROL DETAIL. TU-123 OPERATES FOR LIFE SKILLS OCCUPIED SETPOINTS.
8. NEITHER NORTH OR SOUTH GREASE HOODS ARE ACTIVE.

OCCUPIED MODE (COOKING MODE):

9. REFER TO SUPPLY AIR TERMINAL UNIT CONTROL DETAIL. TU-123 OPERATES FOR LIFE SKILLS OCCUPIED SETPOINTS..
10. REFER TO SEQUENCE OF OPERATION FOR HOOD CONTROLS ABOVE.

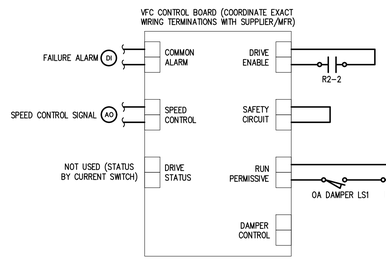
GENERAL CONDITIONS:

11. IN ALL MODES OF OPERATION, MAU-1 SUPPLY FAN, EF-10, AND EF-124 STATUSES SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCHES. ABNORMAL STATUS CONDITIONS SHALL ACTIVATE ALARMS.
12. DDC SHALL MONITOR RELAY RELAYS FOR BAS DISPLAY AND ALARMING.
13. IF MAU-1, EF-108, OR EF-124 ARE RUNNING BETWEEN 11PM AND 5AM, DDC SHALL PROVIDE THE BAS WITH AN ALARM.
14. MAU-1 SF VFC COMMON FAILURE ALARM SHALL BE MONITORED BY DDC THRU AVAILABLE CONTACTS AT RESPECTIVE FAN VFC.
15. WHEN MAU-1 IS DEACTIVATED, OA DAMPER SHALL CLOSE AND SUPPLY FAN VFC CONTROL, HEATING CONTROL, AND COOLING CONTROLS ARE DEACTIVATED.
16. IF THE FIRE SUPPRESSION SYSTEM IS ACTIVATED, MAU-1 AND TU-123 SHALL BE DEACTIVATED VIA INTERLOCK RELAY R-1 AND INTERLOCK WIRING. DDC SHALL ACTIVATE AN ALARM TO THE BAS.



SOUTH HOOD EXHAUST/EF-108 START/STOP WIRING

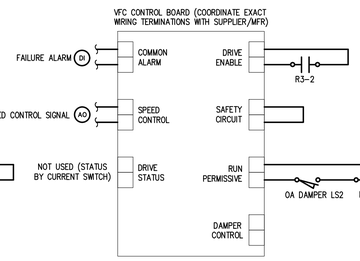
NORTH HOOD EXHAUST/EF-124 START/STOP WIRING



EF-108 EF VFC WIRING

NOTES:

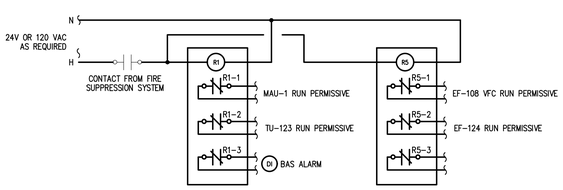
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS FOR DDC STATUS.



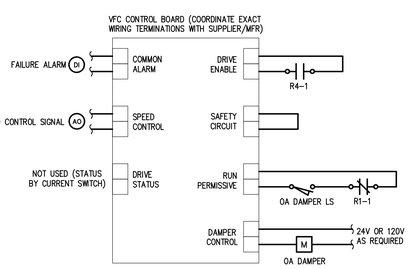
EF-124 EF VFC WIRING

NOTES:

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



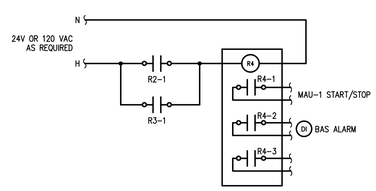
FIRE SUPPRESSION SYSTEM INTERLOCK WIRING



MAU-1 SF VFC WIRING

NOTES:

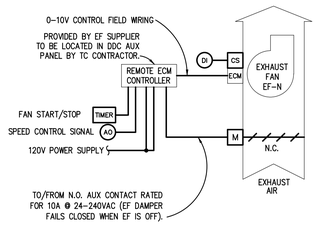
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS FOR DDC STATUS.



MAU-1 & EF-108/-124 SYSTEM INTERLOCK WIRING

TC GENERAL NOTES

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

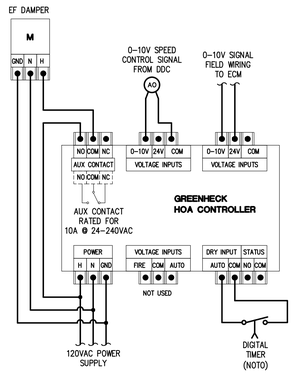


ACTIVE LAB EXHAUST FAN/SUPPLY TU CONTROL

EF-110/TU-136, EF-111/TU-137, EF-116/TU-159, EF-117/TU-158, EF-202/TU-206, & EF-203/TU-207

SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL BE STARTED AND STOPPED BY SPACE USER VIA A DIGITAL TIMER. WIRING INTERLOCK SHALL OPEN DAMPER.
2. WHEN DDC SENSES FAN IS RUNNING VIA CURRENT SWITCH STATUS, DDC SHALL COMMAND THE EXHAUST FAN ECM SPEED SIGNAL BASED ON TAB CONTRACTOR'S FINAL BALANCE REPORT.
3. WHEN DDC SENSES FAN IS RUNNING VIA CURRENT SWITCH STATUS, DDC SHALL OVERRIDE THE TERMINAL UNIT THAT SERVICES THE SPACE TO MAXIMUM DESIGN CFM EQUAL TO EXHAUST FAN CFM.
4. DDC SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. DDC SHALL TOTALIZE FAN MOTOR RUNTIME HOURS OF OPERATION.

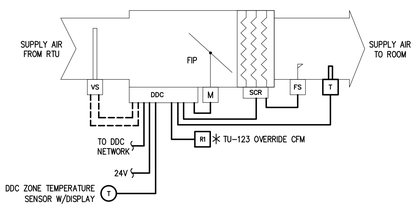


ACTIVE LAB EXHAUST FAN REMOTE ECM CONTROLLER WIRING

TYPICAL

NOTE:

1. BASIS OF DESIGN GREENHECK: REMOTE ECM CONTROLLER TO BE FURNISHED BY EF SUPPLIER. TC CONTRACTOR SHALL INSTALL CONTROLLER IN DDC AUXILIARY ENCLOSURE AND PROVIDE ALL INDICATED FIELD WIRING.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.



TU-123 OVERRIDE CONTROL

NOTES:

1. REFER TO TERMINAL UNIT TC DETAIL AND SEQUENCE OF OPERATION HEREIN FOR SPECIFICS FOR ROOM TEMPERATURE CONTROL.

SEQUENCE OF OPERATION:

1. TU-123 SHALL OPERATE FROM BAS TIME OF DAY SCHEDULED OCCUPANCY FOR ROOM TEMPERATURE SETPOINTS.
2. IF LIFE SKILLS HOOD FIRE SUPPRESSION SYSTEM ACTIVATES, TU-123 SHALL BE SIGNALED THRU INTERLOCK WIRING TO GO TO ZERO CFM (CLOSE THE TU DAMPER).

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DJT
CHECKED	KLH
APPROVED	SVM

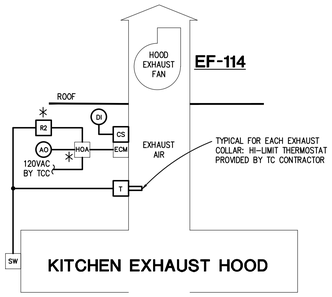
PROJECT NO.

22102

DRAWING NO.

M8.7

g:\2023\2023-0154-00\CAD\2023-0154-M8-CP.dwg, M8.7, 6/17/2024 12:49:06 PM, Rachel L. Wilson, None ,0.09448, Peter Basso Associates Inc.



SPECIAL ED2 HOOD EXHAUST CONTROL

NOTES:

1. ✳ INDICATES TEMPERATURE CONTROL PANEL MOUNTED COMPONENT.
2. COORDINATE WIRING WITH EQUIPMENT SUPPLIERS.
3. TC CONTRACTOR SHALL FURNISH AND INSTALL IMC 2009 COMPLIANT HOOD COLLAR TEMPERATURE INTERLOCK (THERMOSTAT).
4. TAB CONTRACTOR SHALL PROVIDE ALL FAN SETTINGS AFTER FINAL BALANCE IS PERFORMED.
5. FSE SUPPLIED CONTROLLER SHALL OPERATE HOOD LIGHTS AND SHUTDOWN ELECTRICAL POWER TO COOKING DEVICES DURING A FIRE SUPPRESSION EVENT.

SEQUENCE OF OPERATION

TU-167 AND SPECIAL ED2 EXHAUST FAN CONTROL:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, AND TIME DELAYS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

UNOCCUPIED MODE:

1. REFER TO SUPPLY AIR TERMINAL UNIT CONTROL DETAIL. TU-167 NIGHT CYCLES FOR SPECIAL ED2 UNOCCUPIED SETPOINTS.
2. GREASE HOOD FAN EF-114 SHALL BE OFF AND ONLY RUN FROM THE GREASE HOOD CONTROL SWITCH OR THE GREASE HOOD HIGH LIMIT THERMOSTAT, REFER TO "COOKING MODE" HEREIN.
3. IF GREASE HOOD FAN EF-114 IS ACTIVATED, DDC SHALL CALCULATE THE CFM REQUIRED FOR ROOM TEMPERATURE CONTROL AND ADD EF-114 CFM TO IT. TAB CONTRACTOR SHALL PROVIDE FINAL AIR BALANCE DATA.
4. IF GREASE HOOD FAN EF-114 IS MANUALLY ACTIVATED BY HOOD CONTROL SWITCH OR THE GREASE HOOD COLLAR HIGH LIMIT THERMOSTAT SENSES A GREASE HOOD TEMPERATURE HIGHER THAN 85°F SETPOINT (ADJ. AT DEVICE), WIRING INTERLOCKS TO SHALL ACTIVATE EF-114. DDC SHALL SENSE RUNNING STATUSES VIA CURRENT SWITCHES. FSE CONTROLLER SHALL PROVIDE ALL OTHER CONTROL NEEDS FOR THE SYSTEM.
5. WHEN THE GREASE HOOD SWITCH IS OFF AND GREASE HOOD COLLAR HIGH LIMIT THERMOSTAT SENSES LOWER THAN SETPOINT, INTERLOCK WIRING INTERLOCKS SHALL DEACTIVATE EF-114 AND TU-167 REVERTS TO NORMAL ROOM TEMPERATURE CONTROL.

OCCUPIED MODE (NO GREASE HOOD OPERATION):

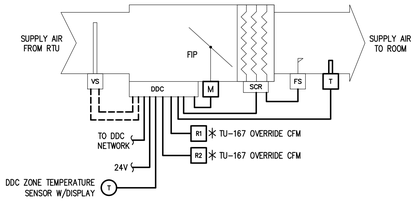
6. REFER TO EF-114 DETAIL FOR CONTROL.
7. ERU-6 RUNS FOR KITCHEN OCCUPIED SETPOINTS BY DDC/BAS.
8. MAU-2, EF-120, AND EF-121 SHALL REMAIN OFF UNTIL ACTIVATED BY LOCAL HOOD CONTROL SWITCH OR EITHER OF THE HOOD COLLAR HIGH LIMIT THERMOSTATS THRU FSE CONTROLLER.

OCCUPIED MODE (COOKING MODE):

9. REFER TO SUPPLY AIR TERMINAL UNIT CONTROL DETAIL. TU-167 NIGHT CYCLES FOR SPECIAL ED2 OCCUPIED SETPOINTS
10. REFER TO ABOVE IS THE GREASE HOOD SWITCH IS ACTIVATED OR THE GREASE HOOD COLLAR HIGH LIMIT THERMOSTAT SENSES HIGH TEMPERATURE SETPOINT.

GENERAL CONDITIONS:

11. IN ALL MODES OF OPERATION, EF-114 STATUSES SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITIONS SHALL ACTIVATE ALARMS.
12. DDC SHALL MONITOR RELAY R-1 FOR BAS DISPLAY AND ALARMING.
13. IF EF-114 IS RUNNING BETWEEN 11PM AND 5AM, DDC SHALL PROVIDE THE BAS WITH AN ALARM.
14. DDC SHALL TOTALIZE EF-114 FAN MOTOR RUN TIME HOURS OF OPERATION FOR BAS DISPLAY.
15. IF THE FIRE SUPPRESSION SYSTEM IS ACTIVATED, TU-167 SHALL BE OVERRIDDEN TO ZERO AIRFLOW VIA INTERLOCK RELAY R-1 AND INTERLOCK WIRING. DDC SHALL ACTIVATE AN ALARM TO THE BAS.



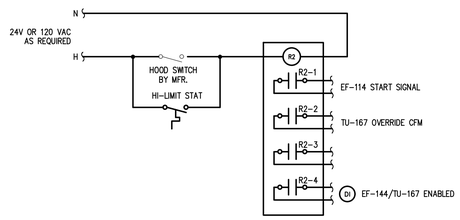
TU-167 OVERRIDE CONTROL

NOTES:

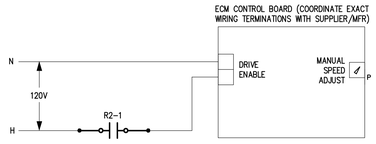
1. REFER TO TERMINAL UNIT TC DETAIL AND SEQUENCE OF OPERATION HEREIN FOR SPECIFICS FOR ROOM TEMPERATURE CONTROL.

SEQUENCE OF OPERATION:

1. TU-167 SHALL OPERATE FROM BAS TIME OF DAY SCHEDULED OCCUPANCY FOR ROOM TEMPERATURE SETPOINTS.
2. IF LIFE SKILLS HOOD EXHAUST FAN AS SENSED BY CURRENT SWITCH, TU-167 SHALL BE SIGNALED THRU DDC TO GO TO MAXIMUM DESIGN CFM (EQUAL TO EXHAUST FAN CFM).



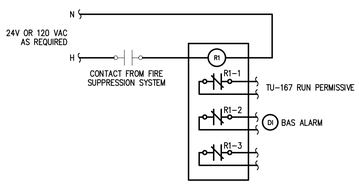
EF-114/TU-167 INTERLOCK WIRING



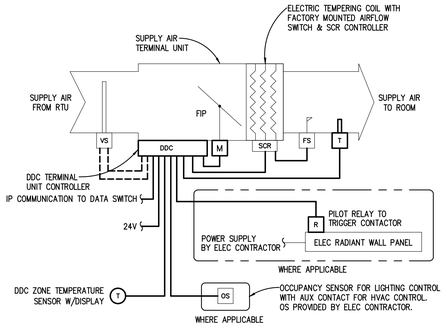
EF-114 ECM WIRING

NOTE:

1. BASIS OF DESIGN GREENHECK: REMOTE ECM SPEED CONTROL TO BE FURNISHED BY EF SUPPLIER.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.
3. TAB CONTRACTOR SHALL ADJUST SPEED AFTER FINAL AIR BALANCE.



FIRE SUPPRESSION SYSTEM INTERLOCK WIRING



AIR TERMINAL UNIT
ELECTRIC HEATING/COOLING - VAV

REFER TO MECHANICAL SCHEDULES FOR LOCATIONS AND NAMES

NOTES:

1. REFER TO TO PIPING AND SHEET METAL PLANS FOR LOCATIONS AND QUANTITY OF UNITS AND LOCATIONS OF ZONE TEMPERATURE SENSORS.
2. WHERE INDICATED ON FLOOR PLANS, ZONE TEMPERATURE SHALL BE REFERENCED TO MULTIPLE AIR TERMINAL UNIT CONTROLLERS VIA DDC NETWORK.
3. TC CONTRACTOR SHALL FURNISH DDC CONTROLLER, ASSOCIATED DAMPER ACTUATOR, ELECTRIC HTG COIL CONTROL AS REQUIRED, DISCHARGE AIR TEMPERATURE SENSOR, AND 24VAC POWER SUPPLY TRANSFORMER.
4. TERMINAL UNIT MANUFACTURER SHALL PROVIDE DAMPER AND VELOCITY SENSOR FOR SYSTEM CONTROL.
5. TC CONTRACTOR SHALL COORDINATE WITH TAB CONTRACTOR TO DETERMINE DAMPER CONTROL SETTINGS TO ACHIEVE SCHEDULED MINIMUM AND MAXIMUM CFMs.
6. ELECTRICAL HEATING COIL AIRFLOW SWITCH(ES) AND OTHER SAFETIES FOR CONTROL SHALL BE SUPPLIED BY HTG COIL SUPPLIER AND INSTALLED BY TC CONTRACTOR. TC CONTRACTOR SHALL COORDINATE FIELD WIRING REQUIREMENTS WITH HTG COIL SUPPLIER.

SEQUENCE OF OPERATION

AIR TERMINAL UNIT W/ ELEC TEMPERING COIL:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, MODE POINTS, ETC., INCLUDING MOTOR RUN TIME HOURS OF OPERATION AND SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

1. ALL ZONE TERMINAL UNITS ASSOCIATED WITH A SINGLE ZONE TEMPERATURE SENSOR SHALL CONTROL IN UNISON.
2. SUPPLY AIR TERMINAL UNIT'S (TU) VAV MINIMUM AND MAXIMUM AIRFLOW SETTINGS SHALL BE AS INDICATED ON THE MECHANICAL SCHEDULES. WHERE MINIMUM AND MAXIMUM AIRFLOW SETTINGS ARE THE SAME, THE TU CONTROLLER SHALL PERFORM CONSTANT AIR VOLUME CONTROL.
3. IN ALL MODES OF HEATING, TU DISCHARGE AIR TEMPERATURE SENSOR SHALL PROVIDE HIGH LIMIT SETPOINT CONTROL AT 90°F DAT. TU ELECTRIC TEMPERING COIL AIRFLOW SAFETIES SHALL KEEP ELECTRIC HEATING COIL OFF IF THERE IS INSUFFICIENT AIRFLOW.
4. WHEN ZONE TEMPERATURE RISES ABOVE THE SETPOINT, THE SUPPLY AIR TERMINAL UNIT CONTROLLER SHALL KEEP THE ELECTRIC TEMPERING COIL OFF AND SHALL MODULATE THE SUPPLY AIRFLOW BETWEEN ITS MINIMUM AND MAXIMUM SETTING TO MAINTAIN ZONE TEMPERATURE.
5. WHEN ZONE TEMPERATURE FALLS BELOW SETPOINT, THE SUPPLY TERMINAL UNIT CONTROLLER SHALL KEEP THE SUPPLY AIRFLOW AT ITS MINIMUM SETTING AND MODULATE ELECTRIC TEMPERING COIL SCR CONTROL TO MAINTAIN THE ZONE TEMPERATURE SETPOINT.
6. (WHERE APPLICABLE): WHEN ZONE IS UNOCCUPIED DURING SCHEDULED OCCUPIED MODE AS DETERMINED BY MONITORING THE LIGHTING OCCUPANCY SENSOR AUX CONTACTS, DDC SHALL OPERATE AIR TERMINAL UNIT IN A TEMPORARY UNOCCUPIED MODE.
7. ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:

   HEATING UNOCCUPIED SETPOINT = 62°F

   HEATING TEMPORARY UNOCCUPIED SETPOINT = 68°F

   HEATING OCCUPIED SETPOINT = 70°F

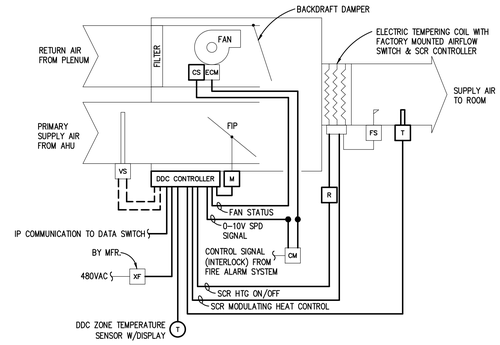
   COOLING OCCUPIED SETPOINT = 75°F

   COOLING TEMPORARY UNOCCUPIED SETPOINT = 77°F

   COOLING UNOCCUPIED SETPOINT = 80°F
8. DURING BUILDING UNOCCUPANCY, RELATED ERU SHALL CYCLE AS REQUIRED TO MAINTAIN BUILDING SETBACK AND SETUP TEMPERATURE SETPOINTS.
9. WHEN RESPECTIVE ERU IS DEACTIVATED; THE TU DAMPER SHALL REMAIN IN MINIMUM POSITION AND THE ELECTRIC TEMPERING COIL SHALL REMAIN OFF.
10. THE TU CONTROLLER SHALL RE-CALIBRATE THE AIRFLOW SENSOR ONCE A WEEK MINIMUM. THE RE-CALIBRATION PROCESS SHALL BE STAGGERED AMONGST THE TERMINAL UNITS SO THE DUCT STATIC PRESSURE DOES NOT EXCEED LIMITS.
11. CONTROL SIGNALS FOR AIR TERMINAL UNIT DAMPER ACTUATOR AND HEATING CONTROL OUTPUT(S) SHALL BE DISPLAYED WITH SYSTEM GRAPHICS.

TC GENERAL NOTES

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



FAN POWERED AIR TERMINAL UNIT CONTROL
ELECTRIC HEATING/COOLING - VAV FAN

TYPICAL

NOTES:

1. REFER TO PIPING & SHEET METAL PLANS FOR LOCATIONS AND QUANTITY OF UNITS AND LOCATIONS OF ZONE TEMPERATURE SENSORS.
2. WHERE INDICATED ON FLOOR PLANS, ZONE TEMPERATURE SHALL BE REFERENCED TO MULTIPLE FAN POWERED AIR TERMINAL UNIT (FPB) CONTROLLERS VIA DDC NETWORK.
3. TC CONTRACTOR SHALL FURNISH DDC CONTROLLER, ASSOCIATED DAMPER ACTUATOR. FAN CONTROL RELAY AS REQUIRED, ELECTRIC HTG COIL CONTROL AS REQUIRED, CURRENT SWITCH FOR FAN STATUS AND DISCHARGE AIR TEMPERATURE SENSOR. 24VAC POWER SUPPLY TRANSFORMER, VELOCITY SENSOR FOR AIRFLOW MEASUREMENT,
4. TERMINAL UNIT MANUFACTURER SHALL PROVIDE ECM FAN, DAMPER, AND VELOCITY SENSOR FOR SYSTEM CONTROL.
5. SPEED SETTING FOR FAN CONSTANT AIRFLOW SHALL BE MANUALLY ADJUSTED AT ECM BY AIR BALANCE CONTRACTOR
6. 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 FPTU FAN MOTOR CONTROL CIRCUIT (ON/OFF CONTROL SIGNAL INTERRUPT OR OTHER AVAILABLE CUTOUT TERMINATION POINT).
7. ELECTRIC TEMPERING COIL AIRFLOW SWITCH(ES) AND OTHER SAFETIES FOR CONTROL SHALL BE FURNISHED BY ELECTRIC TEMPERING COIL SUPPLIER AND INSTALLED BY TC CONTRACTOR. TC CONTRACTOR SHALL COORDINATE FIELD WIRING REQUIREMENTS WITH ELECTRIC TEMPERING COIL SUPPLIER.
8. ELECTRICAL CONTRACTOR SHALL PROVIDE POWER SUPPLY FOR FPB AND ELECTRIC TEMPERING COIL.

SEQUENCE OF OPERATION

PARALLEL FAN POWERED TERMINAL UNIT (FPB) W/ VAV PRIMARY AIR:

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, MODE POINTS, ETC., INCLUDING MOTOR RUN TIME HOURS OF OPERATION AND SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

1. WHEN ASSOCIATED ERU IS OPERATING, FPB SHALL OPERATE IN AN OCCUPIED MODE AND FPB FAN SHALL REMAIN OFF. WHEN ERU IS OFF, FPB SHALL OPERATE IN UNOCCUPIED HEATING MODE TO CYCLE FPB FAN ON/OFF WITH SPEED MODULATION DESCRIBED BELOW WHENEVER ZONE TEMPERATURE DROPS BELOW HEATING UNOCCUPIED SETPOINT.
2. VAV PRIMARY SUPPLY AIR MINIMUM AND MAXIMUM AIRFLOW SETTINGS SHALL BE AS INDICATED ON THE MECH EQUIPMENT SCHEDULE.
3. IN ALL MODES OF HEATING, FPB DISCHARGE AIR TEMPERATURE SENSOR SHALL PROVIDE HIGH LIMIT SETPOINT CONTROL AT 90°F DAT. PACKAGED AIRFLOW SWITCH SHALL KEEP ELECTRIC TEMPERING COIL OFF IF THERE IS INSUFFICIENT AIRFLOW.
4. FOR OCCUPIED COOLING MODE: FPB FAN SHALL REMAIN OFF. WHEN ZONE TEMPERATURE RISES ABOVE THE COOLING SETPOINT, FPB CONTROLLER SHALL KEEP THE ELECTRIC TEMPERING COIL OFF AND MODULATE THE PRIMARY AIR DAMPER BETWEEN MINIMUM AND MAXIMUM AIRFLOW SETTINGS TO ACHIEVE ZONE TEMPERATURE SETPOINT.
5. FOR OCCUPIED HEATING MODE: WHEN ZONE TEMPERATURE FALLS BELOW ZONE HEATING SETPOINT, THE SUPPLY AIR FPB CONTROLLER SHALL FIRST MODULATE FPB DAMPER TOWARDS ITS MINIMUM AIRFLOW SETTING. WHEN AIRFLOW IS AT MINIMUM, FPB CONTROLLER SHALL MODULATE ELECTRIC TEMPERING COIL OUTPUT TO ACHIEVE ZONE TEMPERATURE SETPOINT. IF THE ZONE TEMPERATURE IS BELOW SETPOINT WITH DISCHARGE AIR TEMPERATURE (DAT) AT HIGH LIMIT SETPOINT, FPB CONTROLLER SHALL MODULATE FPB FAN HIGHER (AS NEEDED) WITH DAT MAINTAINED AT HIGH LIMIT SETPOINT WITH ELECTRIC TEMPERING COIL MODULATION) TO ACHIEVE ZONE TEMPERATURE SETPOINT.
6. ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:

   HEATING UNOCCUPIED SETPOINT = 62°F

   HEATING OCCUPIED SETPOINT = 70°F

   COOLING OCCUPIED SETPOINT = 75°F

   COOLING UNOCCUPIED SETPOINT = 80°F
7. FOR UNOCCUPIED COOLING MODE: FPB FAN SHALL REMAIN OFF. WHEN ZONE TEMPERATURE RISES ABOVE UNOCCUPIED SETPOINT, ASSOCIATED ERU SHALL BE ACTIVATED AND THE FPB DDC CONTROLLER SHALL KEEP THE ELECTRIC TEMPERING COIL AND FPB FAN OFF AND MODULATE THE PRIMARY AIR DAMPER BETWEEN MINIMUM AND MAXIMUM AIRFLOW SETTINGS TO ACHIEVE ZONE TEMPERATURE SETPOINT.
8. FOR UNOCCUPIED HEATING MODE: ASSOCIATED ERU SHALL REMAIN OFF. WHEN ZONE TEMPERATURE FALLS BELOW UNOCCUPIED SETPOINT, FPB FAN SHALL BE CYCLED ON AND OFF AS REQUIRED (WHILE PRIMARY INLET AIR DAMPER REMAINS CLOSED). FPB CONTROLLER SHALL MODULATE ELECTRIC TEMPERING COIL OUTPUT TO ACHIEVE ZONE TEMPERATURE SETPOINT.
9. WHEN RESPECTIVE ERU IS DEACTIVATED FOR UNOCCUPIED COOLING MODE, ASSOCIATED FPB PRIMARY AIR DAMPERS SHALL REMAIN CLOSED AND THE ELECTRIC TEMPERING COIL SHALL REMAIN OFF. IF ERU CYCLES ON FOR UNOCCUPIED COOLING DEMAND, ALL FPB PRIMARY DAMPERS SHALL BE MODULATED OPEN TO AT LEAST MINIMUM POSITION IF NOT MORE DUE TO INDIVIDUAL ZONE COOLING DEMAND.
10. FPB FAN STATUS THRU ECM RATED CURRENT SWITCH SHALL BE MONITORED BY DDC. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM TO BAS.
11. ONCE A DAY MINIMUM, THE DDC FPB CONTROLLER SHALL RE-SYNCHRONIZE FLOATING CONTROL DAMPER ACTUATOR BY FULLY CLOSING AND OPENING THE ACTUATOR. THE RE-SYNCHRONIZATION PROCESS SHALL OCCUR WHEN RELATED ERU IS DEACTIVATED.
12. FPB PRIMARY AIR DAMPER AND ELECTRIC TEMPERING COIL OUTPUT MODULATION SHALL BE DISPLAYED WITH SYSTEM GRAPHICS.
13. FIRE ALARM SYSTEM CONTROL MODULE SHALL DEACTIVATE FPB FAN WHEN PRODUCTS OF COMBUSTION ARE DETECTED AT ASSOCIATED AHU. ASSOCIATED ERU SHALL ALSO BE DEACTIVATED THRU FAS CUT-OUT.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DJT
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M8.8

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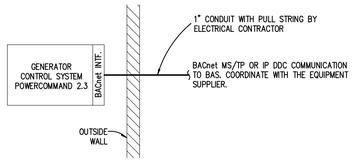
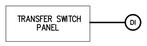


EMERGENCY GENERATOR SYSTEM MONITORING

NOTES:

TC CONTRACTOR SHALL PROVIDE NETWORK COMMUNICATION WIRING FROM EMERGENCY GENERATOR SYSTEM SUPPLIER'S INTERFACE TO THE BAS NETWORK SUPERVISORY CONTROLLER, COMMUNICATING BUT NOT LIMITED TO THE FOLLOWING MONITORING POINTS AS AVAILABLE:

- CONTROL SWITCH OFF-RUN-AUTO POSITION
- MOST RECENT FAULT OR WARNING
- GENERATOR RUNNING STATUS
- GENERATOR SUPPLY LOAD STATUS
- GENERATOR VOLTAGE PER PHASE
- GENERATOR CURRENT PER PHASE
- TOTAL KW OUTPUT
- TOTAL KVAR OUTPUT
- BATTERY VOLTAGE
- OIL PRESSURE
- OIL TEMPERATURE
- COOLANT TEMPERATURE
- INTAKE MANIFOLD TEMPERATURE
- FUEL TEMPERATURE
- FUEL RATE
- TOTAL FUEL CONSUMPTION
- AVERAGE ENGINE SPEED
- TOTAL RUNNING TIME
- TOTAL NUMBER OF RUNS
- TOTAL START ATTEMPTS
- "NOT IN AUTO" WARNING
- CHECK GENERATOR ALARM
- AC CHARGER ALARM
- LOW COOLANT LEVEL ALARM
- LOW FUEL LEVEL ALARM
- HIGH BATTERY VOLTAGE ALARM
- LOW BATTERY VOLTAGE ALARM
- WEAK BATTERY ALARM
- FAIL TO START ALARM
- PRE-HIGH ENGINE TEMP WARNING
- HIGH ENGINE TEMP ALARM
- PRE-LOW PRESSURE WARNING
- LOW PRESSURE WARNING
- OVERSPEED ALARM
- GENERATOR DERANGEMENT
- OTHER WARNINGS AND ALARMS



AUTOMATIC TRANSFER SWITCH

TYPICAL

NOTES:

DRY CONTACT FOR AUTOMATIC TRANSFER SWITCH MONITORING SHALL BE PROVIDED WITH THE AUTOMATIC TRANSFER SWITCH. COORDINATE WIRING REQUIREMENTS WITH THE AUTOMATIC TRANSFER SWITCH SUPPLIER.

REFER TO ELECTRICAL DRWGS FOR AUTOMATIC TRANSFER SWITCH LOCATIONS.

SEQUENCE OF OPERATION

DDC SHALL MONITOR AUTOMATIC TRANSFER SWITCHES FOR "ON COMMERCIAL POWER" AND "ON GENERATOR POWER" STATUS.

SUMP AND SEWAGE PUMP ALARM MONITORING

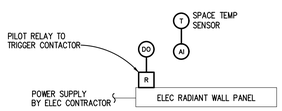
TYPICAL

NOTE

DRY CONTACT FOR REMOTE SYSTEM MONITORING SHALL BE PROVIDED WITH PUMP CONTROL PANEL. COORDINATE WIRING REQUIREMENTS WITH PUMP SYSTEM SUPPLIER.

SEQUENCE OF OPERATION

DDC SHALL MONITOR SUMP PUMP SYSTEM FOR HIGH WATER LEVEL ALARM.



STANDALONE ELECTRIC RADIANT WALL PANEL CONTROL

TYPICAL FOR STANDALONE RWP NOT ASSOCIATED WITH AN HVAC UNIT OR TERMINAL UNIT

NOTES:

1. REFER TO FLOOR PLANS FOR LOCATION OF UNITS.
2. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER.

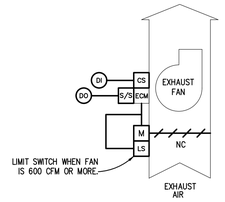
SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, MODE POINTS, ETC., SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. DDC CONTROLLER SHALL PREVENT LOOP "WINDUP".

1. DDC SHALL CYCLE ELECTRIC RADIANT WLL PANEL CONTROL TO MAINTAIN SPACE TEMPERATURE SETPOINT.
2. SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:

   HEATING UNOCCUPIED SETPOINT = 62°F

   HEATING OCCUPIED SETPOINT = 70°F



TYPICAL EF CONTROL THRU BAS

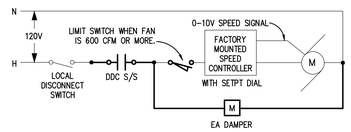
EF-101, -102, -103, -105, -107, -109, -112, -113, -115, -118, -119, -201, -204, & -205

NOTES:

1. REFER TO FLOOR PLANS FOR LOCATION OF UNITS.
2. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER.

SEQUENCE OF OPERATION

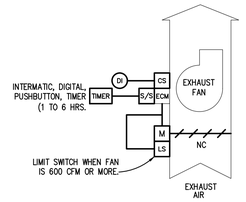
1. EXHAUST FAN SHALL BE STARTED AND STOPPED BY DDC BASED ON BAS TIME OF DAY SCHEDULED OCCUPIED MODE. WIRING INTERLOCK SHALL OPEN DAMPERS. WHERE REQUIRED, LIMIT SWITCH SHALL MAKE BEFORE FAN CAN START.
2. DDC SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.



EXHAUST FAN ECM CONTROL WIRING

NOTE:

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



MANUALLY CONTROLLED EXHAUST FAN CONTROL THRU DIGITAL TIMER

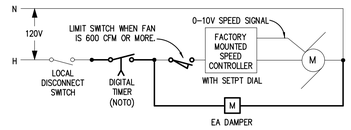
TYPICAL - REFER TO MECHANICAL SCHEDULE FOR "MANUAL" CONTROL

NOTES:

1. REFER TO FLOOR PLANS FOR LOCATION OF UNITS.
2. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER.

SEQUENCE OF OPERATION

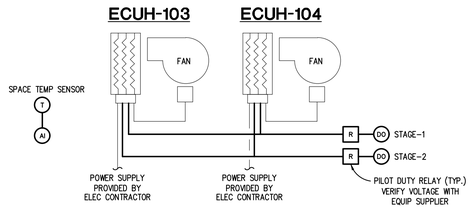
1. EXHAUST FAN SHALL BE STARTED AND STOPPED BY SPACE USER VIA A MANULA WALL SWITCH. WIRING INTERLOCK SHALL OPEN DAMPERS. WHERE REQUIRED, LIMIT SWITCH SHALL MAKE BEFORE FAN CAN START.
2. DDC SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH.



EXHAUST FAN ECM CONTROL WIRING

NOTE:

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



ECUH-103 AND ECUH-104 CONTROL

TYPICAL

NOTES:

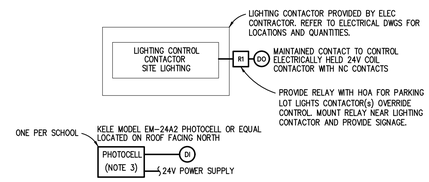
1. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER.

SEQUENCE OF OPERATION

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

ASHRAE 90.1 FOR VESTIBULES ONLY:

1. DDC SHALL CYCLE ELECTRIC CABINET UNIT HEATERS (ECUH) CONTROL CIRCUITS ON/OFF AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 60°F.
2. DDC SHALL PROVIDE 2°F DEADBAND FOR CONTROL.
3. WHEN OUTSIDE AIR TEMPERATURE INCREASES ABOVE 45°F, DDC SHALL DISABLE CONTROL OF THE ECUH.



BUILDING EXTERIOR LIGHTING CONTROL

NOTES:

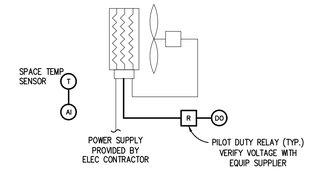
1. REFER TO LIGHTING SYSTEM AND CONTROLLER DETAILS ON E7 ELECTRICAL DRAWINGS.
2. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH ELECTRICAL CONTRACTOR.
3. TC CONTRACTOR SHALL PROVIDE PHOTOCELL, 24V POWER SUPPLY, AND ASSOCIATED WIRING FOR BAS TIME OF DAY SCHEDULED CONTROL AND MONITORING OF EXTERIOR LIGHTING.

SEQUENCE OF OPERATION:

1. THE DDC MONITORED PHOTOCELL SHALL BE USED FOR CONTROL LIGHTS "ON" AT 5FC AND LOWER AND "OFF" AT 8FC AND HIGHER BASED ON OUTSIDE (AMBIENT) LIGHT LEVELS.
2. "OFF" SCHEDULED OPERATION MAY BE PERFORMED BY BUILDING AUTOMATION SYSTEM CONTROL AS DIRECTED BY OWNER. "ON" IS STILL VIA PHOTOCELL.

TC GENERAL NOTES

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



ELECTRIC UNIT HEATER CONTROL

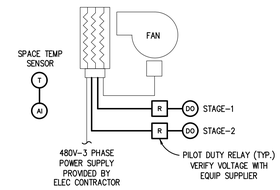
TYPICAL

NOTE: REFER TO FLOOR PLANS FOR LOCATION OF UNIT. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER.

SEQUENCE OF OPERATION

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

1. EUH SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. EUH SHALL OPERATE BASED ON BAS TIME OF DAY SCHEDULED OCCUPIED MODE AND UNOCCUPIED MODE.
2. DDC SPACE TEMPERATURE SENSOR SHALL CYCLE EUH CONTROL CIRCUIT ON/OFF TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 68°F IN OCCUPIED MODE AND 50°F IN UNOCCUPIED MODE.
3. WHEN OUTSIDE AIR TEMPERATURE IS 65°F (ADJ.) OR ABOVE, DDC SHALL DISABLE EUH CONTROL.
4. DDC SHALL PROVIDE A 2°F DEADBAND FOR CONTROL.



ELECTRIC CABINET UNIT HEATER CONTROL

TYPICAL

NOTE: REFER TO FLOOR PLANS FOR LOCATION OF UNIT. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER. ONE OR TWO STAGES BASED ON EQUIPMENT SUBMITTALS.

SEQUENCE OF OPERATION

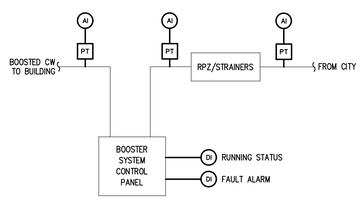
NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

ASHRAE 90.1 FOR VESTIBULES ONLY:

1. DDC SHALL CYCLE ELECTRIC CABINET UNIT HEATER (ECUH) CONTROL CIRCUIT ON/OFF AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 60°F.
2. DDC SHALL PROVIDE 2°F DEADBAND FOR CONTROL.
3. WHEN OUTSIDE AIR TEMPERATURE INCREASES ABOVE 45°F, DDC SHALL DISABLE CONTROL OF THE ECUH.

ALL OTHER LOCATIONS:

1. ECUH SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ECUH SHALL OPERATE BASED ON BAS TIME OF DAY SCHEDULED OCCUPIED MODE AND UNOCCUPIED MODE.
2. DDC SPACE TEMPERATURE SENSOR SHALL CYCLE ECUH CONTROL CIRCUIT ON/OFF TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 68°F IN OCCUPIED MODE AND 50°F IN UNOCCUPIED MODE.
3. DDC SHALL PROVIDE A 2°F DEADBAND FOR CONTROL.
4. WHEN OUTSIDE AIR TEMPERATURE IS 65°F (ADJ.) OR ABOVE, DDC SHALL DISABLE ECUH CONTROL.



BOOSTED CITY WATER ALARM MONITORING

REFER TO FLOOR PLANS FOR LOCATIONO

NOTE: DRY CONTACTs FOR REMOTE SYSTEM MONITORING SHALL BE PROVIDED WITH BOOSTER PUMP PACKAGE CONTROL PANEL. COORDINATE WIRING REQUIREMENTS WITH BOOSTER PUMP SYSTEM SUPPLIER.

SEQUENCE OF OPERATION:

1. DDC SHALL MONITOR BOOSTER PUMP CONTROLLER POINTS AS SHOWN. DDC SHALL PROVIDE ENABLE/DISABLE POINT CONTROL FROM BAS.
2. DDC SHALL MONITOR PRESSURE TRANSMITTERS FOR BAS DISPLAY WITH HIGH/LOW ALARMS.

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M8.9

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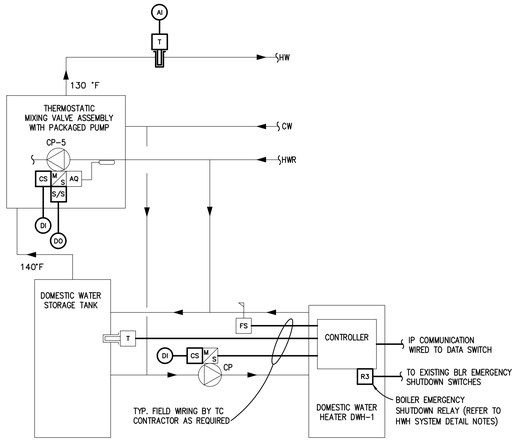


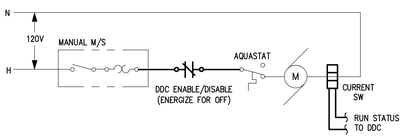
BLDG DWH-1 SYSTEM MONITORING & CONTROL

NOTES:

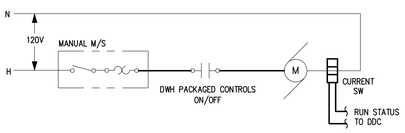
1. DOMESTIC WATER HEATER IS PROVIDED WITH PACKAGED CONTROLS AND IP BACNET COMMUNICATION INTERFACE. TC CONTRACTOR SHALL PROVIDE FIELD WIRING FOR TANK TEMP SENSORS, PUMP STARTER, AND FLOW SWITCH WIRING AS SHOWN.
2. TC CONTRACTOR SHALL PROVIDE MECH ROOM EMERGENCY SHUTDOWN WIRING, AND RELAY AS SHOWN. REFER TO WIRING DETAILS.
3. CIRC PUMP CP-5 AQUASTAT PROVIDED WITH PACKAGED SYSTEM. S/S RELAY AND CURRENT SWITCH PROVIDED BY TC CONTRACTOR. COORDINATE WIRING REQUIREMENTS WITH THE EQUIPMENT SUPPLIER.
4. PUMP CURRENT SWITCHES PROVIDED BY TC CONTRACTOR.

SEQUENCE OF OPERATION:

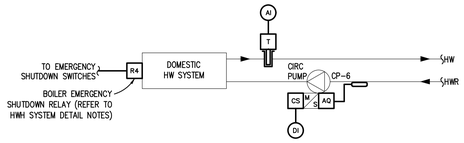
1. ALL SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL PUMP MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.
2. DWH SYSTEM SHALL BE ENABLED/DISABLED FROM BAS THRU BACnet INTERFACE AND SHALL OPERATE BASED ON BAS TIME OF DAY SCHEDULED OCCUPIED MODE AND HW TEMPERATURE SETPOINT THRU THE MFR. PROVIDED BACNET INTERFACE.
3. DOMESTIC WATER CIRC PUMP CP-5 SHALL BE ENABLE/DISABLED BY DDC BASED ON BAS TIME OF DAY BUILDING OCCUPANCY SCHEDULE. THE PUMP'S AQUASTAT SHALL CYCLE THE PUMP ON/OFF BASED ON AQUASTAT SETPOINT. AQUASTAT SHALL PROVIDE 4°F DEADBAND FOR CONTROL.
4. DOMESTIC WATER STORAGE TANK CIRC PUMP SHALL BE STARTED/STOPPED BY DWH CONTROLLER.
5. DDC SHALL MONITOR DWH SYSTEM CIRC PUMPS THRU RESPECTIVE CURRENT SWITCHES AND TOTALIZE RUN TIME HOURS OF OPERATION FOR BAS STATUS DISPLAY.
6. DDC SHALL MONITOR THE HW TEMPERATURE AND PROVIDE DISPLAY FOR SYSTEM OPERATORS WITH HIGH ALARM SET 5°F ABOVE RESPECTIVE DWH SUPPLY SETPOINT (ALARM SETPOINT ADJUSTABLE THRU BAS).
7. DWH SHALL BE CONNECTED TO MECH RM EMERGENCY SHUTDOWN SYSTEM. (REFER TO HWH SYSTEM WIRING DETAILS).



DWH MIX VALVE ASSEMBLY PUMP M/S WIRING



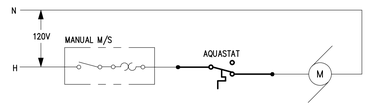
DWH/TANK CP M/S WIRING



KITCHEN DWH-2 SYSTEM MONITORING & CONTROL

SEQUENCE OF OPERATION:

1. AQUASTAT SHALL ACTIVATE DOMESTIC HW CIRC PUMP CP-6 BASED ON THE AQUASTAT'S SETPOINT.
2. AQUASTAT SHALL PROVIDE 6°F DEADBAND FOR CONTROL BASED ON THE DOMESTIC HW SYSTEM SUPPLY TEMPERATURE SETTING. (3°F ABOVE AND 3°F BELOW HW TEMP.)
3. DDC SYSTEM SHALL MONITOR DOMESTIC HW SYSTEM SUPPLY TEMP FOR REMOTE SYSTEM DIAGNOSTIC CAPABILITY BY OWNER AND PROVIDE AN ALARM AT 4°F ABOVE AND 4°F BELOW THE HW SYSTEM SUPPLY TEMPERATURE SETTING.
4. DDC SYSTEM SHALL MONITOR DOMESTIC HW PUMP CP-6 AND TOTALIZE RUN TIME HOURS OF OPERATION FOR BAS DISPLAY.
7. DWH SHALL BE CONNECTED TO MECH RM EMERGENCY SHUTDOWN SYSTEM. (REFER TO HWH SYSTEM WIRING DETAILS).

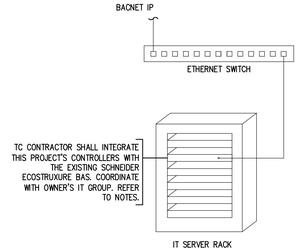


DOMESTIC HW CP-6 M/S WIRING

TYPICAL.

TC GENERAL NOTES

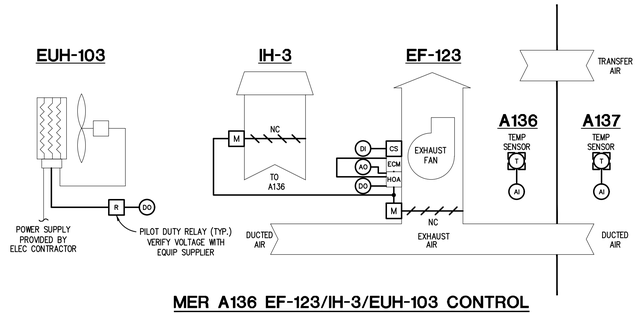
TC GENERAL NOTES ON DRAWING M8.1 APPLY TO THIS DRAWING.



(E)BUILDING AUTOMATION SYSTEM NETWORK SERVER

NOTES:

1. EXISTING SCHNEIDER ECOSTRUXURE BUILDING AUTOMATION SYSTEM SHALL COMMUNICATE TO THIS PROJECT'S CONTROLLERS FOR BAS OPERATOR'S GRAPHICAL INTERFACE.
2. PROVIDE BUILDING GRAPHICS ASSOCIATED WITH ALL CONTROLLERS COMMUNICATING THRU NETWORK CONTROLLER SCHNEIDER MODE AS.
3. TC CONTRACTOR SHALL BE RESPONSIBLE TO DEVELOP SYSTEM GRAPHICS FOR BUILDING AND SUB-DIVISIONS WITHIN BUILDING DURING THE PROJECT.
4. TC CONTRACTOR SHALL INTEGRATE BACnet POINTS FOR CONTROL AND MONITORING FROM NETWORK SUPERVISORY CONTROLLER TO MAKE THE GRAPHICS FUNCTIONAL ONTO THE BAS SERVER.
5. TC CONTRACTOR SHALL PROVIDE TIME OF DAY SCHEDULES, TOD RELATED SETPOINTS, ALARM SETPOINTS, AND TREND DATA POINTS. COORDINATE WITH OWNER'S REPRESENTATIVE.



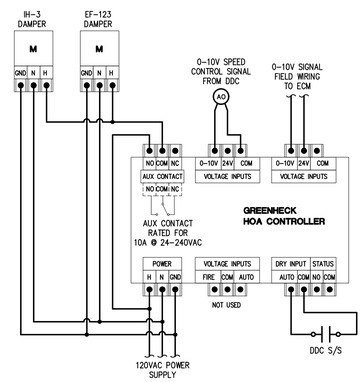
MER A136 EF-123/IH-3/EUH-103 CONTROL

NOTES:

1. COORDINATE WIRING REQUIREMENTS AND TERMINATIONS WITH EQUIPMENT SUPPLIER.
2. TAB CONTRACTOR SHALL PROVIDE TC CONTRACTOR EF-123 SPEED SETTING AFTER FINAL AIR BALANCE.
3. MOUNT CURRENT SWITCH ON MOTOR LEADS.

SEQUENCE OF OPERATION:

1. DDC SHALL MONITOR BOTH MER-A136 AND ER-A137 ROOM TEMPERATURE SENSORS. DDC SHALL RUN EF-123 TO MAINTAIN 75°F ROOM TEMPERATURE SETPOINT AT EITHER SENSOR.
2. DDC SHALL COMMAND EUH-103 TO PROVIDE 68°F ROOM TEMPERATURE SETPOINT AT MER-A136 SENSOR.
3. DDC SHALL PROVIDE 2°F DEADBAND FOR HEATING/COOLING CONTROL.
4. DDC SHALL COMMAND EF-123 THRU MFR PROVIDED HOA INTERFACE LOCATED IN TC AUX PANEL. WHEN COMMANDED ON, IH-3 AND EF-123 DAMPERS SHALL OPEN. WHEN COMMANDED OFF, IH-3 AND EF-123 DAMPERS SHALL CLOSE.
5. DDC SHALL TOTALIZE RUN TIME HOURS OF OPERATION FROM FAN STATUS FOR BAS DISPLAY.



MER A136 EF-123/IH-3 REMOTE ECM CONTROLLER WIRING

TYPICAL

NOTE:

1. BASIS OF DESIGN GREENHECK: REMOTE ECM CONTROLLER TO BE FURNISHED BY EF SUPPLIER. TC CONTRACTOR SHALL INSTALL CONTROLLER IN DDC AUXILIARY ENCLOSURE AND PROVIDE ALL INDICATED FIELD WIRING.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.

TMP ARCHITECTURE

TMP ARCHITECTURE INC
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PH - 248.338.4561 FX - 248.338.0223
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REGISTRATION SEAL

CONSULTANT

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www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DJT
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M8.10

g:\2023\2023-0154-00\CAD\2023-0154-M8-CP.dwg, M8.10, 6/17/2024 12:49:10 PM, Rachel L. Wilson, None ,0.09448, Peter Basso Associates Inc.

TC GENERAL NOTES

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

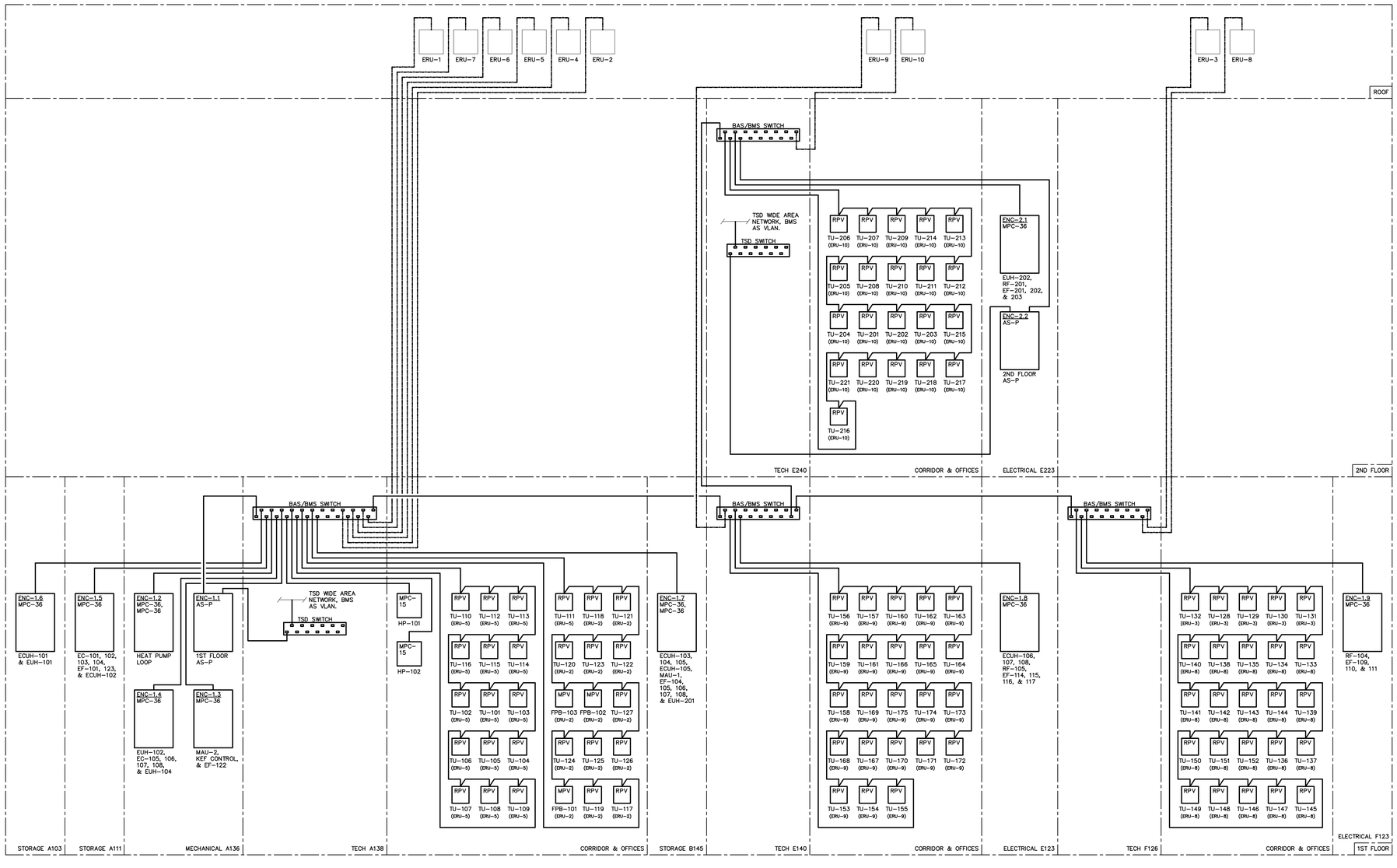
BMS COMMUNICATIONS NETWORK

ALL CONTROLLER TO CONTROLLER WIRE RUNS ARE LESS THAN 100 METERS (CAT6)
ALL CONTROLLER TO SWITCH WIRE RUNS ARE LESS THAN 100 METERS (CAT6)
* ENTERPRISE SERVER AND WORKSTATION PRO MAY BE VIRTUALIZED
* ENTERPRISE SERVER AND WORKSTATION PRO TO RESIDE ON VLAN
AS-P CONTOLLERS TO RESIDE ON VLAN
VPN ACCESS TO BUILDING ENGINEERS FOR WIRELESS AND REMOTE ACCESS

MOBILE DEVICES IE (IPAD/PHONE) MUST BE ENABLED (VIA USER CREDENTIAL)
TO ACCESS BMS VLAN (ENTERPRISE SERVER IP)

OUTSIDE – INSIDE ACCESS
BY LOGMEIN PRO OR VPN

WIRE LEGEND
- BACNET IP (CAT6)
- LAN (CAT6)
- ECOSTRUXURE BUS (CAT6)



NO.	REVISION:	DATE:

PROJECT TITLE:
TROY SCHOOL DISTRICT
NEW SMITH MIDDLE SCHOOL

TEMPERATURE CONTROLS
BAS / BMS
SYSTEM RISER

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN DJT
CHECKED KLH
APPROVED SVM

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PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

TEMPERATURE CONTROLS

PROJECT NO.

22102

DRAWING NO.

M8.11

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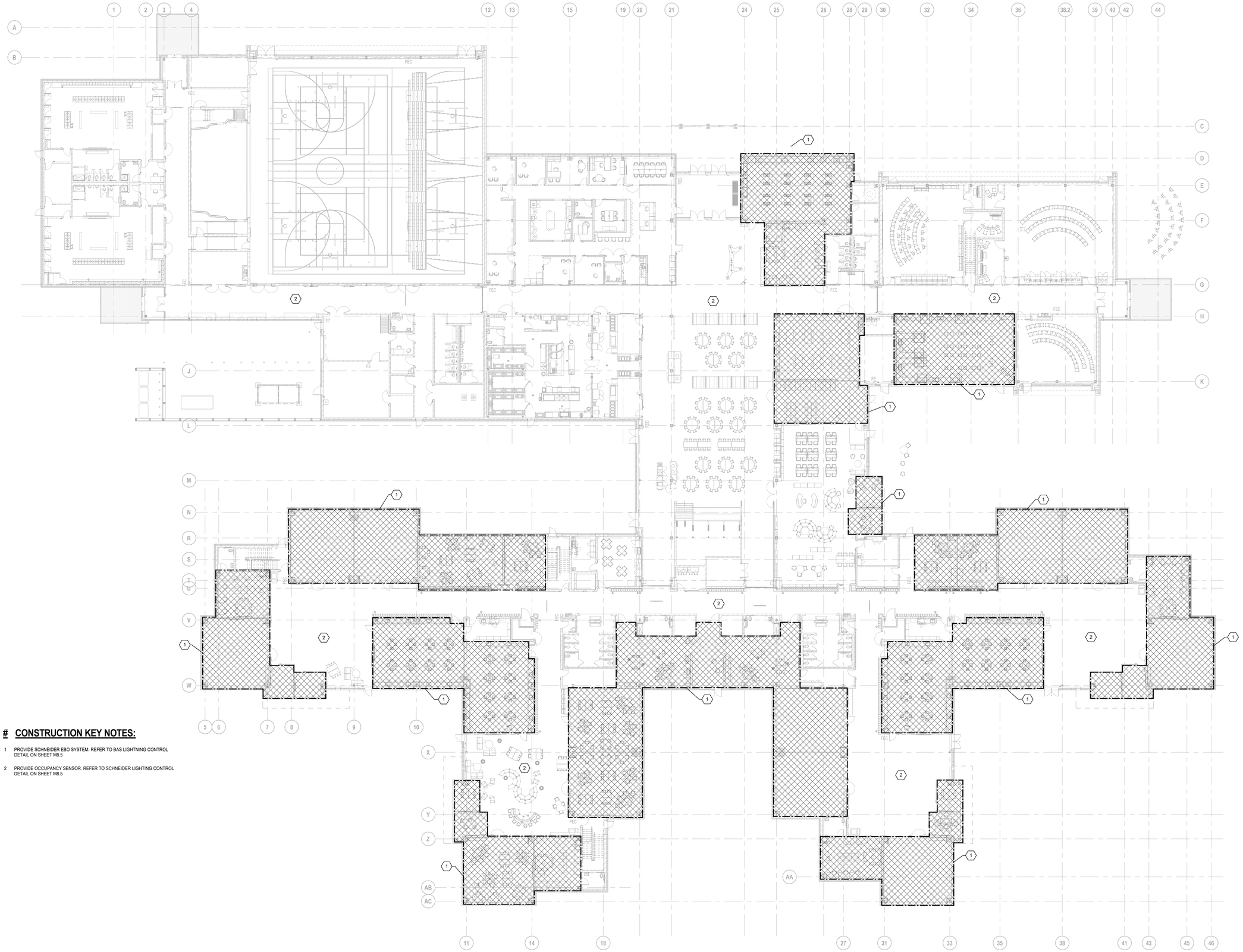
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



CONSTRUCTION KEY NOTES:

1 PROVIDE SCHNEIDER EBO SYSTEM. REFER TO BAS LIGHTNING CONTROL DETAIL ON SHEET M8.5

2 PROVIDE OCCUPANCY SENSOR. REFER TO SCHNEIDER LIGHTING CONTROL DETAIL ON SHEET M8.5

FIRST LEVEL TEMPERATURE CONTROLS PLAN

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

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PROJECT TITLE

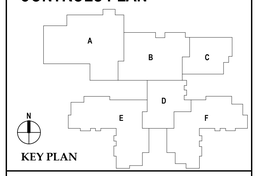
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL TEMPERATURE CONTROLS PLAN



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-23-2204	ADDENDUM #4

DRAWN	WTF
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M8.12

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

CONSTRUCTION KEY NOTES:

1 PROVIDE SCHNEIDER EBO SYSTEM. REFER TO BAS LIGHTNING CONTROL DETAIL ON SHEET M8.5

2 PROVIDE OCCUPANCY SENSOR. REFER TO SCHNEIDER LIGHTING CONTROL DETAIL ON SHEET M8.5

SECOND LEVEL TEMPERATURE CONTROLS PLAN

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

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

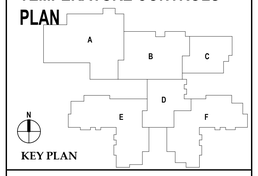
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL TEMPERATURE CONTROLS PLAN



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-23-2204	ADDENDUM #4

DRAWN	WTF
CHECKED	KLH
APPROVED	SVM

PROJECT NO.

22102

DRAWING NO.

M8.13

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ELECTRICAL SYMBOL LIST (NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.)

SYMBOL	DESCRIPTION
X (NL)	X DENOTES FIXTURE TYPE (NL INDICATES NIGHT LIGHT)
	LIGHTING FIXTURE
	DIRECT/INDIRECT LIGHTING FIXTURE
	FILL DENOTES EMERGENCY LIGHTING FIXTURE
	LIGHTING FIXTURE
	WALL MOUNTED LIGHTING FIXTURE
	LIGHTING FIXTURE
	RECESSED OR SURFACE MOUNTED 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
ALCR	AUTOMATIC LOAD CONTROL RELAY
BCELTS	BRANCH CIRCUIT EMERGENCY LIGHTING TRANSFER SWITCH
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
DO	DIMMER OCCUPANCY SENSOR SWITCH
DL	LOW VOLTAGE DIMMER SWITCH
D3	3 WAY 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 ANNUNCIATOR 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 OUTLET (SIMILAR FOR TAMPER RESISTANT, CONTROLLED, QUADS, EMERGENCY, UPS, USB, AND GFCI RECEPTACLE OUTLETS)
X	DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE OUTLET
	DEAD FRONT GROUND FAULT CIRCUIT INTERRUPTER
	DUPLEX EMERGENCY RECEPTACLE OUTLET
	DUPLEX TAMPER RESISTANT RECEPTACLE OUTLET
	QUAD TAMPER RESISTANT RECEPTACLE OUTLET
	DUPLEX UPS RECEPTACLE OUTLET
	DUPLEX RECEPTACLE OUTLET WITH 2 USB PORTS
	USB 4 PORT CHARGING STATION
	CEILING MOUNTED DUPLEX / QUAD RECEPTACLE OUTLET
	MULTI-OUTLET SURFACE RACEWAY
	POWER POLE
	WALL / CEILING MOUNTED SPECIAL RECEPTACLE OUTLET - REFER TO ELECTRICAL STANDARD SCHEDULES
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
S3	DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S33	3-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S34	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 SCHEDULE
OS X	OCCUPANCY SENSOR - REFER TO ELECTRICAL STANDARD SCHEDULES - "X" INDICATES TYPE

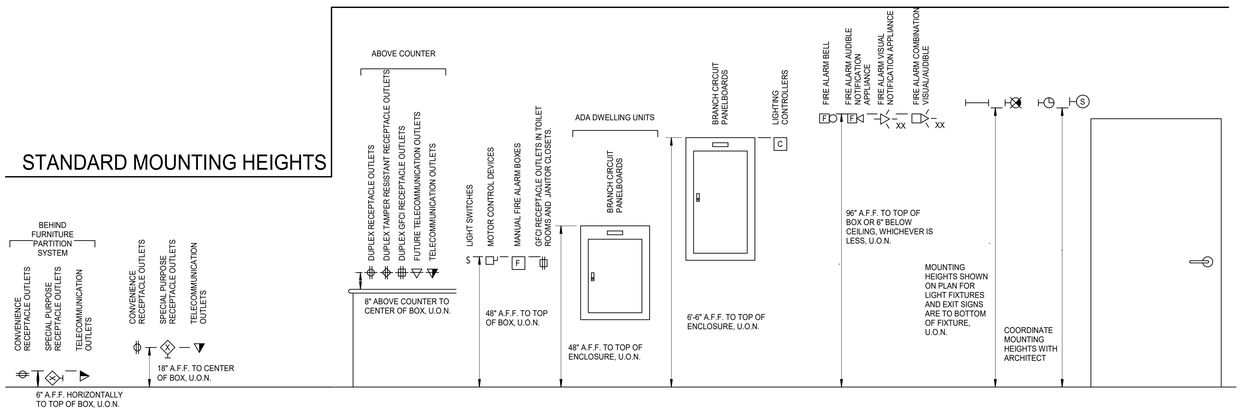
SYMBOL	DESCRIPTION
CP	CONTROL PANEL
	MOTOR
VFC	VARIABLE FREQUENCY CONTROLLER
	MANUAL CONTROLLER
	MAGNETIC CONTROLLER
	COMBINATION MAGNETIC CONTROLLER
	NON-FUSIBLE DISCONNECT SWITCH
	FUSIBLE DISCONNECT SWITCH
CB	ENCLOSED CIRCUIT BREAKER
	PUSH BUTTON STATION
J	JUNCTION BOX
	HARD WIRE POWER CONNECTION
	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
	EMPTY BOX FOR FUTURE TELECOMMUNICATION OUTLET MOUNTED 8" ABOVE COUNTERTOP
	EMPTY BOX FOR FUTURE CEILING MOUNTED TELECOMMUNICATION OUTLET
X	TELECOMMUNICATION OUTLET "X" INDICATES TYPE
X	TELECOMMUNICATION OUTLET MOUNTED 8" ABOVE COUNTERTOP "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
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
	TIME CLOCK
C	CONTACTOR
P	PHOTOCELL
TT	TWIST TIMER
EVSE	ELECTRICAL VEHICLE SUPPLY EQUIPMENT
DCFC	DC FAST CHARGER - STANDALONE
DCPM	DC FAST CHARGER - POWER MODULE
DCDP	DC FAST CHARGER - DISPENSER

REFER TO ELECTRICAL STANDARD SCHEDULES

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

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
	BRANCH CIRCUIT PANEL BOARD
	LOAD CENTER
	MOTOR CONTROL CENTER
T	TRANSFORMER
	DISTRIBUTION PANEL
GB	ELECTRICAL GROUNDING BUS BAR
PB	PLUG IN BUSWAY
FB	FEEDER BUSWAY

STANDARD MOUNTING HEIGHTS



ELECTRICAL DRAWING INDEX

SHEET NO.	SHEET TITLE
E5.5	PANEL SCHEDULES
E0.1	ELECTRICAL STANDARDS AND DRAWING INDEX
E0.2	ELECTRICAL STANDARD SCHEDULES
E0.3	ELECTRICAL SITE NEW WORK PLAN
E0.4	FIRST LEVEL ELECTRICAL COMPOSITE PLAN
E0.5	SECOND LEVEL ELECTRICAL COMPOSITE PLAN
E0.6	ROOF LEVEL ELECTRICAL COMPOSITE PLAN
E2.1A	FIRST LEVEL LIGHTING PLAN - ZONE 'A'
E2.1B	FIRST LEVEL LIGHTING PLAN - ZONE 'B'
E2.1C	FIRST LEVEL LIGHTING PLAN - ZONE 'C'
E2.1D	FIRST LEVEL LIGHTING PLAN - ZONE 'D'
E2.1E	FIRST LEVEL LIGHTING PLAN - ZONE 'E'
E2.1F	FIRST LEVEL LIGHTING PLAN - ZONE 'F'
E2.2C	MEZZANINE LEVEL LIGHTING PLAN - ZONE 'C'
E2.2D	SECOND LEVEL LIGHTING PLAN - ZONE 'D'
E2.2E	SECOND LEVEL LIGHTING PLAN - ZONE 'E'
E3.1A	FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'A'
E3.1B	FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'B'
E3.1C	FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'C'
E3.1D	FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'D'
E3.1E	FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'E'
E3.1F	FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'F'
E3.2C	MEZZANINE LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'C'
E3.2D	SECOND LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'D'
E3.2E	SECOND LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'E'
E6.2	ENLARGED ELECTRICAL PLAN
E5.1	ONE LINE DIAGRAM
E5.2	PANEL SCHEDULES
E5.3	PANEL SCHEDULES
E5.4	PANEL SCHEDULES
E6.1	ENLARGED ELECTRICAL PLAN
E7.1	ELECTRICAL DETAILS AND DIAGRAMS
E7.2	ELECTRICAL DETAILS AND DIAGRAMS
E7.3	ELECTRICAL DETAILS AND DIAGRAMS
E7.4	ELECTRICAL DETAILS AND DIAGRAMS
E7.5	ELECTRICAL DETAILS AND DIAGRAMS
E7.6	ELECTRICAL DETAILS AND DIAGRAMS
E7.7	ELECTRICAL DETAILS AND DIAGRAMS

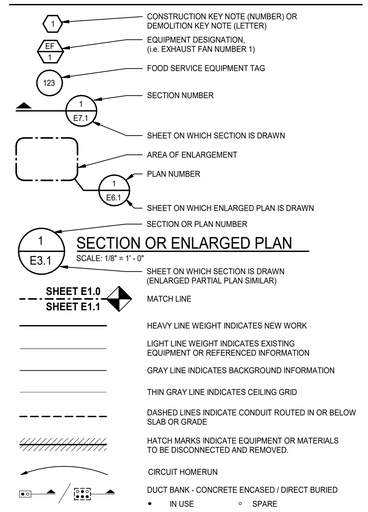
ELECTRICAL ABBREVIATION LIST

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
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
ECM	ELECTRONICALLY COMMUTATED MOTOR
ELEC	ELECTRICAL
EM/ EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EO	ELECTRICALLY OPERATED
EPO	EMERGENCY POWER OFF
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
FA	FIRE ALARM
FLA	FULL LOAD AMPS
FLR	FLOOR
FOH	FRONT OF HOUSE
FSEC	FOOD SERVICE EQUIPMENT CONTRACTOR
FU	FUSE
G/GRD/EG	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
HV	HIGH VOLTAGE
HZ	HERTZ
IG	ISOLATED GROUND

ABBREVIATION	DESCRIPTION
JB	JUNCTION BOX
KA	THOUSAND AMP
KV	KILOVOLT
KVA	KILOVOLT - AMPERES
KW	KILOWATT
KWH	KILOWATT - HOURS
LA	LIGHTING 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
ST	SHUNT TRIP
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TB	TERMINAL BOX
TELECOM	TELECOMMUNICATIONS
TR	TAMPER RESISTANT
TTP	TELEPHONE TERMINAL BACKBOARD
TYP	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
US	UPSTAGE
V	VOLTS
W	WIRE OR WATTS
WAP	WIRELESS ACCESS POINT
WG	WIRE GUARD
WP	WEATHERPROOF
WR	WEATHER RESISTANT
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
(E)	EXISTING
(R)	RELOCATED

STANDARD METHODS OF NOTATION



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PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

ELECTRICAL STANDARDS AND DRAWING INDEX

ISSUE DATES

DATE:	ISSUED FOR:
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CHECKED	ZDB
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FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE - GENERAL PURPOSE

OVERCURRENT DEVICE RATING (AMPERES)	COPPER CONDUCTORS: WIRE SIZE (AWG OR KCMIL) PHASE & NEUTRAL	COPPER CONDUCTORS: WIRE SIZE (AWG OR KCMIL) GROUND	COPPER CONDUCTORS: CONDUIT SIZE SINGLE PHASE 2 WIRE+G (1PH, 1N, 1G)	COPPER CONDUCTORS: CONDUIT SIZE SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	COPPER CONDUCTORS: CONDUIT SIZE THREE PHASE 3 WIRE+G (3PH, 1G)	COPPER CONDUCTORS: CONDUIT SIZE THREE PHASE & NEUTRAL 4 WIRE+G (3PH, 1N, 1G)	KEYED NOTES	ALUMINUM CONDUCTORS: WIRE SIZE (AWG OR KCMIL) PHASE & NEUTRAL	ALUMINUM CONDUCTORS: WIRE SIZE (AWG OR KCMIL) GROUND	ALUMINUM CONDUCTORS: CONDUIT SIZE SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	ALUMINUM CONDUCTORS: CONDUIT SIZE THREE PHASE 3 WIRE+G (3PH, 1G)	ALUMINUM CONDUCTORS: CONDUIT SIZE THREE PHASE & NEUTRAL 4 WIRE+G (3PH, 1N, 1G)
15-20	12	12	3/4"	3/4"	3/4"	3/4"		N/A	N/A	N/A	N/A	N/A
25-30	10	10	3/4"	3/4"	3/4"	3/4"		N/A	N/A	N/A	N/A	N/A
35-40	8	10	3/4"	3/4"	3/4"	3/4"		N/A	N/A	N/A	N/A	N/A
45-50	8 (6)	10	3/4"	3/4"	3/4"	3/4"	1	N/A	N/A	N/A	N/A	N/A
60	6 (4)	10	3/4" (1")	3/4" (1")	3/4" (1")	1" (1 1/4")	1	N/A	N/A	N/A	N/A	N/A
70	4	8	1"	1 1/4"	1 1/4"	1 1/4"		N/A	N/A	N/A	N/A	N/A
80	4 (3)	8	1"	1 1/4"	1 1/4"	1 1/4"	1	N/A	N/A	N/A	N/A	N/A
90-100	3 (2)	8	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1	1	6	1 1/2"	1 1/4"	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. CONDUCTORS ARE BASED ON THHN/THWN UP TO AND INCLUDING #4/0. LARGER THAN #4/0 ARE BASED ON TYPE XHHW.
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.
9. N/A = NOT ACCEPTABLE

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.

DRY TYPE DISTRIBUTION TRANSFORMER CIRCUIT SIZING SCHEDULE

TRANSFORMER KVA	PRIMARY (480V) OVERCURRENT PROTECTION	SECONDARY (208Y/120 VOLT) OVERCURRENT PROTECTION	CONDUCTOR SIZE (AWG OR KCMIL) PHASE & NEUTRAL COPPER	PHASE & NEUTRAL ALUMINUM	SUPPLY SIDE BONDING JUMPER COPPER	SUPPLY SIDE BONDING JUMPER ALUMINUM	CONDUIT (4W + SSBJ) COPPER	CONDUIT (4W + SSBJ) ALUMINUM	GROUNDING ELECTRODE CONDUCTOR COPPER	GROUNDING ELECTRODE CONDUCTOR ALUMINUM	KEYED NOTES
9	20A	30A	10	NA	8	NA	3/4"	NA	8	NA	
15	25A	60A	6	NA	8	NA	1"	NA	8	NA	1
30	45A	100A	3	1	8	6	1 1/4"	1 1/2"	8	6	1
45	70A	175A	2/0	4/0	4	2	2"	2 1/2"	4	2	
75	125A	300A/225A	350 / 4/0	500 / 300	2	1/0	3"	3 1/2"	2	1/0	2
112 1/2	175A	400A	600	2-250	1/0	2	3 1/2"	2-2 1/2"	1/0	1/0	
150	225A	600A	2-350	2-500	2-2	2-1/0	2-3"	2-3 1/2"	2/0	4/0	
225	350A	800A	2-600	3-400	2-1/0	3-1/0	2-3 1/2"	3-3"	3/0	4/0	
300	500A	1200A	3-600	4-500	3-1/0	4-1/0	3-3 1/2"	4-3 1/2"	3/0	250	
500	800A	1600A	4-600	5-600	4-1/0	5-3/0	4-3 1/2"	5-3 1/2"	3/0	250	

GENERAL NOTES:
1. TRANSFORMERS AND FEEDERS ARE BASED ON 480 VOLT, 3 PHASE, 3 WIRE PRIMARY AND 208Y/120 VOLT, 3 PHASE, 4 WIRE, SECONDARY.
2. ALUMINUM CONDUCTORS ARE PERMITTED ONLY IF INCLUDED IN FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE.
3. PRIMARY OVERCURRENT PROTECTION IS SIZED AT 125% OF TRANSFORMER FULL LOAD CURRENT. PROVIDE PRIMARY OVERCURRENT DEVICE SELECTION TO ALLOW TRANSFORMER IN-RUSH CURRENT AND PROTECT BASED ON THE ANSI DAMAGE CURVE. IF MANUFACTURER REQUIRES PRIMARY OVERCURRENT GREATER THAN 125% (NOT TO EXCEED 250%) THEN PRIMARY FEEDER SHALL BE INCREASED ACCORDINGLY.
4. SECONDARY CONDUCTOR BASED ON TEN FOOT MAXIMUM LENGTH (NEC 240.21(C)(2)). IF CONDUCTORS ARE LONGER THAN TEN FOOT, REQUIREMENTS IN NEC 240.21(C)(6) MUST BE MET. IN NO CASE SHALL CONDUCTORS BE LONGER THAN TWENTY-FIVE FEET.

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.
2. THE SMALLER SIZE IS TO BE USED TO FEED 225A PANELBOARDS.

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.

MOTOR CIRCUIT SIZING SCHEDULE (120V, SINGLE PHASE)

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

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

SPECIAL RECEPTACLES

TYPE	DESCRIPTION
Type 0	
Type 7	125/250V 30A SINGLE PHASE RECEPTACLE, 3 POLE, 4 WIRE (NEMA 14-30R)
Type 8	125/250V 50A SINGLE PHASE RECEPTACLE, 3 POLE, 4 WIRE (NEMA 14-50R)
Type 9	125 20A SINGLE PHASE LOCKING RECEPTACLE, 2 POLE, 3 WIRE (NEMA L5-20R)
Type 9	125V, 30A, SINGLE PHASE, LOCKING RECEPTACLE, 2 POLE, 3 WIRE (NEMA L5-30R)

RACEWAY / CONDUCTOR / CABLE APPLICATION SCHEDULE

	WIRE: COPPER, TYPE THIN/THWN-2	WIRE: COPPER, TYPE XHHW-2	WIRE: ALUMINUM, TYPE XHHW-2 (100A AND ABOVE ONLY)	RACEWAY: ELECTRICAL METALLIC TUBING (EMT)	RACEWAY: INTERMEDIATE METAL CONDUIT (IMC)	RACEWAY: RIGID STEEL CONDUIT	RACEWAY: PVC-COATED RIGID STEEL CONDUIT	RACEWAY: RIGID NON-METALLIC CONDUIT (RNC) TYPE EPC-40	RACEWAY: RIGID NON-METALLIC CONDUIT (RNC) TYPE EPC-80	RACEWAY: HIGH DENSITY POLYETHYLENE (HDPE) SCHEDULE 40	RACEWAY: HIGH DENSITY POLYETHYLENE (HDPE) SCHEDULE 80	RACEWAY: LIQUID TIGHT FLEXIBLE METAL CONDUIT (LFMC)	RACEWAY: METAL CLAD TYPE CABLE WITH INSULATED GROUND WIRE (TYPE MC)	CABLE/CORD: TWO HOUR FIRE RATED MINERAL INSULATED CABLE (TYPE MI) (KEYED NOTE 3)	CABLE/CORD: TWO HOUR FIRE RATED CABLE (RHW-2) (KEYED NOTE 3)	CABLE/CORD: TWO HOUR RATED MC POWER CABLE (KEYED NOTE 3)	CABLE/CORD: VFC CABLE	CABLE/CORD: POWER LIMITED CABLE
FEEDERS - EXTERIOR																			
EXPOSED, WITH FREESTANDING SUPPORT		X	X		X	X	X												
CONCEALED IN RETAINING WALL OR SIMILAR ELEMENT		X	X			X	X	X	X										
BELOW PARKING LOTS AND ROADWAYS		X	X				X		X		X								
BELOW GREEN SPACE		X	X				X	X		X									
WITHIN 5' OF FOUNDATION WALL		X	X			X	X												
ROOFTOPS (WHEN APPROVED BY ENGINEER)		X	X		X	X	X												
FEEDERS - INTERIOR																			
CONCEALED, ACCESSIBLE CEILINGS	X		X	X	X														
CONCEALED, INACCESSIBLE CEILINGS	X		X	X	X														
CONCEALED IN GYPSUM BOARD PARTITION WALLS	X		X	X	X														
CONCEALED IN CMU WALLS	X		X	X	X														
EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE	X		X		X	X	X							X					
EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE	X		X	X	X									X					
EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	X		X	X	X									X					
BELOW SLAB ON GRADE	X		X			X	X	X	X					X					
DAMP AND WET LOCATIONS	X		X		X	X	X	X											
BRANCH CIRCUITS - EXTERIOR																			
EXPOSED, SURFACE MOUNTED TO STRUCTURE		X			X	X	X		X										
EXPOSED, WITH FREESTANDING SUPPORT		X			X	X	X												
CONCEALED IN RETAINING WALL OR SIMILAR ELEMENT		X				X	X	X											
BELOW PARKING LOTS AND ROADWAYS		X				X	X	X		X									
BELOW GREEN SPACE		X						X											
WITHIN 5' OF FOUNDATION WALL		X				X	X												
ROOFTOPS (WHEN APPROVED BY ENGINEER)		X			X	X	X												
BRANCH CIRCUITS - INTERIOR																			
CONCEALED, ACCESSIBLE CEILINGS	X			X	X								X						
CONCEALED, INACCESSIBLE CEILINGS	X			X	X														
CONCEALED IN GYPSUM BOARD PARTITION WALLS	X			X	X								X						
CONCEALED IN CMU WALLS	X			X	X														
EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE	X				X	X	X												
EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE	X			X	X									X					
EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	X			X	X														
EXPOSED, FINISHED SPACES	X																		
BELOW SLAB ON GRADE	X							X											
EMBEDDED IN ELEVATED CONCRETE SLAB	X							X											
DAMP AND WET LOCATIONS	X				X	X	X	X				X							
SPECIAL APPLICATIONS																			
SERVICE ENTRANCE - UNDERGROUND		X	X				X	X	X	X	X								
CONNECTION BETWEEN VFC AND MOTORS (KEYED NOTE 1)																		X	
CLASS 1 CONTROL CIRCUITS	X			X	X	X													
CLASS 2 CONTROL CIRCUITS	X			X	X	X													X
CLASS 3 CONTROL CIRCUITS	X			X	X	X													X
EMERGENCY FEEDERS UNDER NEC 700.10(D) (KEYED NOTE 2)		X	X	X	X	X	X	X	X	X	X		X	X	X				
CONNECTIONS TO TRANSFORMERS, MOTORS AND VIBRATING EQUIPMENT		X										X							

GENERAL NOTES:
1. TRANSITION FROM PVC/HDPE AND PROVIDE RIGID STEEL OR RTRC SWEEPS WHERE CONDUITS PENETRATE WALLS, CONCRETE SLABS, CONCRETE BASES, AND ASPHALT.
2. REFER TO SPECIFICATIONS FOR RESTRICTIONS ON MC/AC CABLE INSTALLATION.
3. EMT SHALL NOT BE USED ON THE EXTERIOR OF A BUILDING OR IN AREAS SUBJECT TO DAMAGE BELOW 10' AFF.
4. INSTALL SURFACE RACEWAYS ONLY WHERE SHOWN 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.
2. EMERGENCY FEEDERS IN OCCUPANCIES THAT ARE UNDER 700.10(D) SHALL HAVE A TWO HOUR RATING. RATING SHALL BE OBTAINED BY ROUTING CONDUIT AND BUILDING WIRE IN SPRINKLERED SPACE, IN A TWO HOUR SHAFT, OUTSIDE OF THE BUILDING, IN A LISTED TWO HOUR RATED RACEWAY, OR UNDER A MINIMUM OF 2" OF CONCRETE; OR BY USING A LISTED TWO-HOUR RATED CABLE ASSEMBLY.
3. SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS BASED ON UL TESTING AND RATING.

BRANCH CIRCUIT VOLTAGE DROP WIRING SCHEDULE FOR SINGLE PHASE CIRCUITS

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

FLOOR SERVICE FITTING SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER (SEE NOTE #2)	MODEL	DEVICE CONFIGURATION	FLANGE/COVER MATERIAL & COLOR	SERVICE PLATE TYPE	MINIMUM DEPTH	MAXIMUM CONDUIT
FB1	MULTI FUNCTION: SIX GANG, STAMPED STEEL WITH SPECIAL FINISH FOR SLAB ON GRADE APPLICATION, RECESSED FLOOR BOX.	WIREMOLD	RFB4MX-OG	3D / 3T	FINISH BY ARCHITECT	RF	4"	1 1/4"
FB1C	ABOVE: FLOOR SERVICE FITTING FOR POWER. MOUNTED TO CAST IRON FLOOR BOX FOR SLAB ON GRADE APPLICATIONS	WIREMOLD	525 MTD NO 800-CI FLOOR BOX	COORDINATE WITH FSEC FOR NEMA CONFIGURATIONS	AL	N/A	3"	3/4"
FB2C	ABOVE: FLOOR SERVICE FITTING FOR POWER. MOUNTED TO CAST IRON FLOOR BOX FOR SLAB ON GRADE APPLICATIONS	WIREMOLD	525 MTD NO 800-CI FLOOR BOX	COORDINATE WITH FSEC FOR NEMA CONFIGURATIONS	AL	N/A	3"	3/4"

GENERAL NOTES:
1. PROVIDE 1 1/4"C. FROM EACH TELECOM FLOOR BOX (GANG) TO ACCESSIBLE LOCATION IN CEILING.
2. OTHER ACCEPTABLE MANUFACTURERS ARE STEEL CITY, OR HUBBELL-RACO.
3. ALL PRODUCTS IN THIS SCHEDULE SHALL MEET AND EXCEED THE UL514A or UL514C SCRUB WATER EXCLUSION REQUIREMENT.
4. COORDINATE ALL TELECOM AND A/V OUTLETS WITH COMMUNICATIONS AND A/V CONTRACTORS.

PF = PARTITION FEED
D = DUPLEX RECEPTACLE
T = 2 TELECOM OPENINGS

BS = BRASS
AL = ALUMINUM
BK = BLACK
GY = GRAY (CONCRETE)
BZ = BRONZE
NK = NICKEL

FR = FLIP LID/RECTANGULAR
SL = SLIDES
FC = FLIP COVER

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

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PBA Project No: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

ELECTRICAL STANDARD SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN DDS
CHECKED ZDB
APPROVED STP

PROJECT NO.
22102

DRAWING NO.
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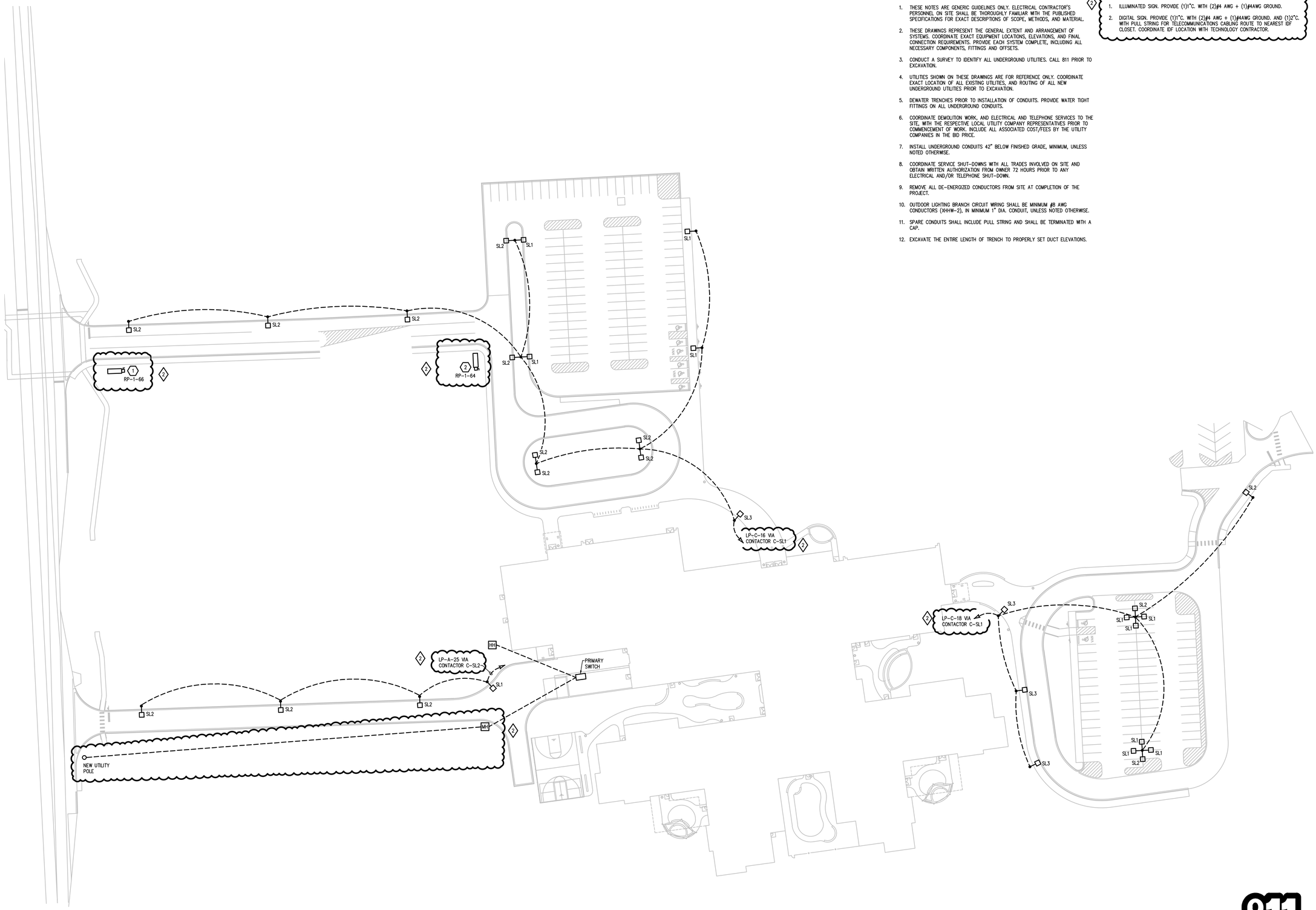

ELECTRICAL SITE NEW WORK PLAN

SCALE: 1" = 40'

SITE PLAN GENERAL NOTES:

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

CONSTRUCTION KEY NOTES:

1. ILLUMINATED SIGN. PROVIDE (1)1"C. WITH (2)#4 AWG + (1)#4AWG GROUND.
2. DIGITAL SIGN. PROVIDE (1)1"C. WITH (2)#4 AWG + (1)#4AWG GROUND. AND (1)2"C. WITH PULL STRING FOR TELECOMMUNICATIONS CABLING ROUTE TO NEAREST IDF CLOSET. COORDINATE IDF LOCATION WITH TECHNOLOGY CONTRACTOR.

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

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PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

ELECTRICAL SITE NEW WORK PLAN

ISSUE DATES

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PROJECT NO.

22102

DRAWING NO.

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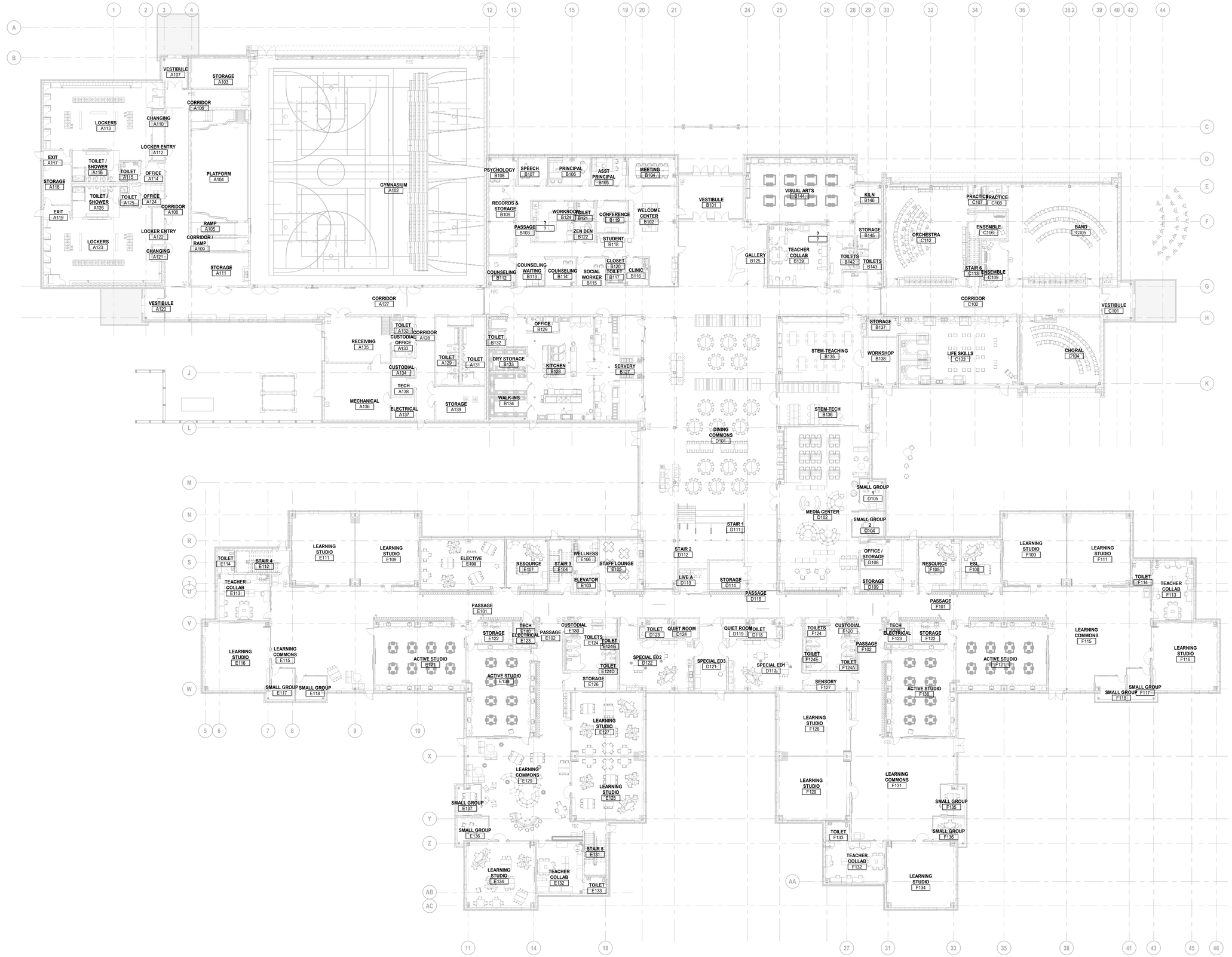
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



FIRST LEVEL ELECTRICAL COMPOSITE PLAN

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

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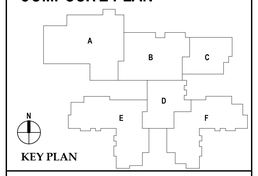
Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL ELECTRICAL COMPOSITE PLAN



KEY PLAN

ISSUE DATES

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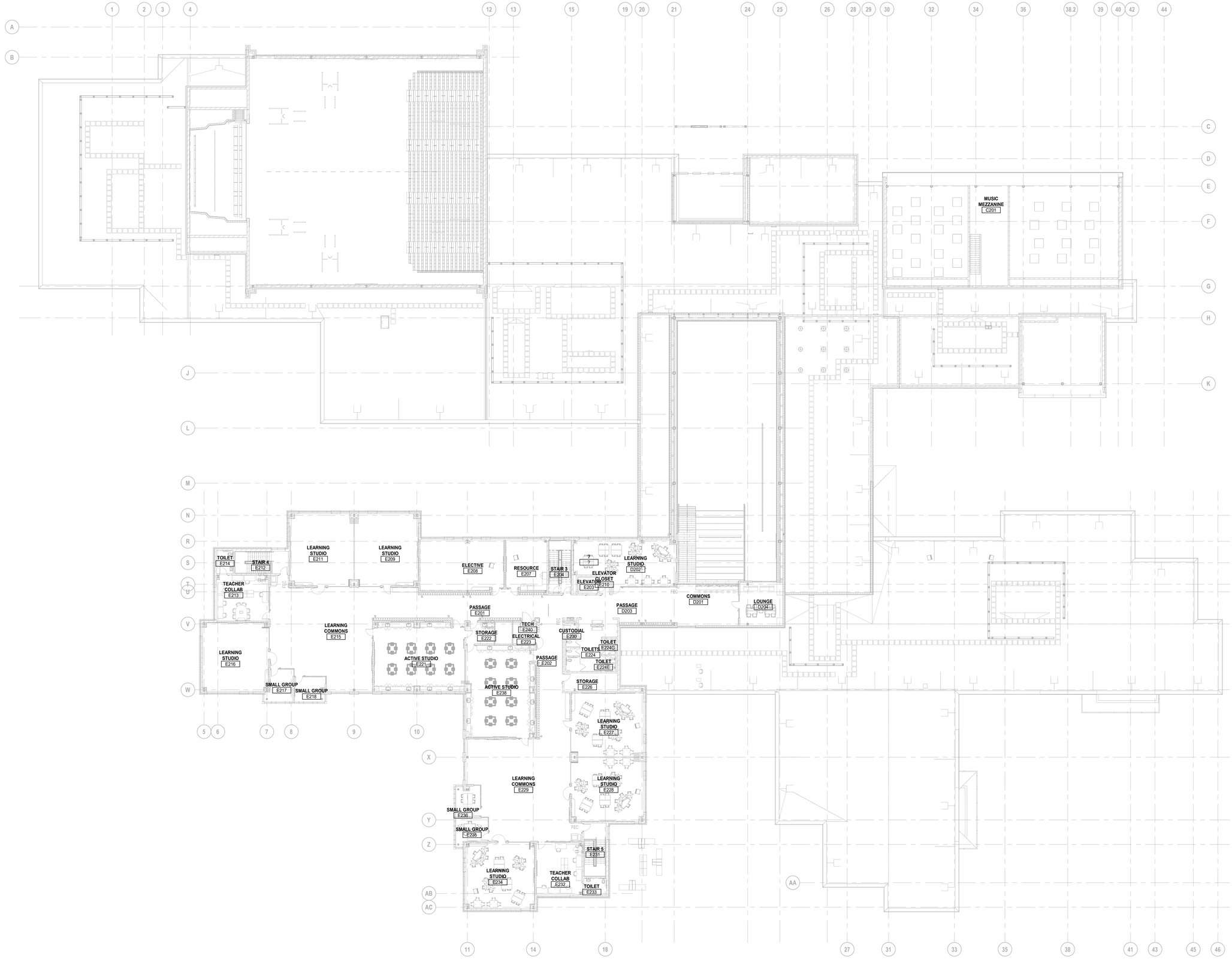

SECOND LEVEL ELECTRICAL COMPOSITE PLAN

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

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PROJECT TITLE

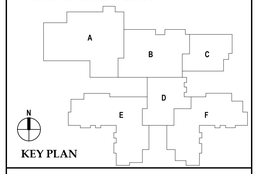
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL ELECTRICAL COMPOSITE PLAN



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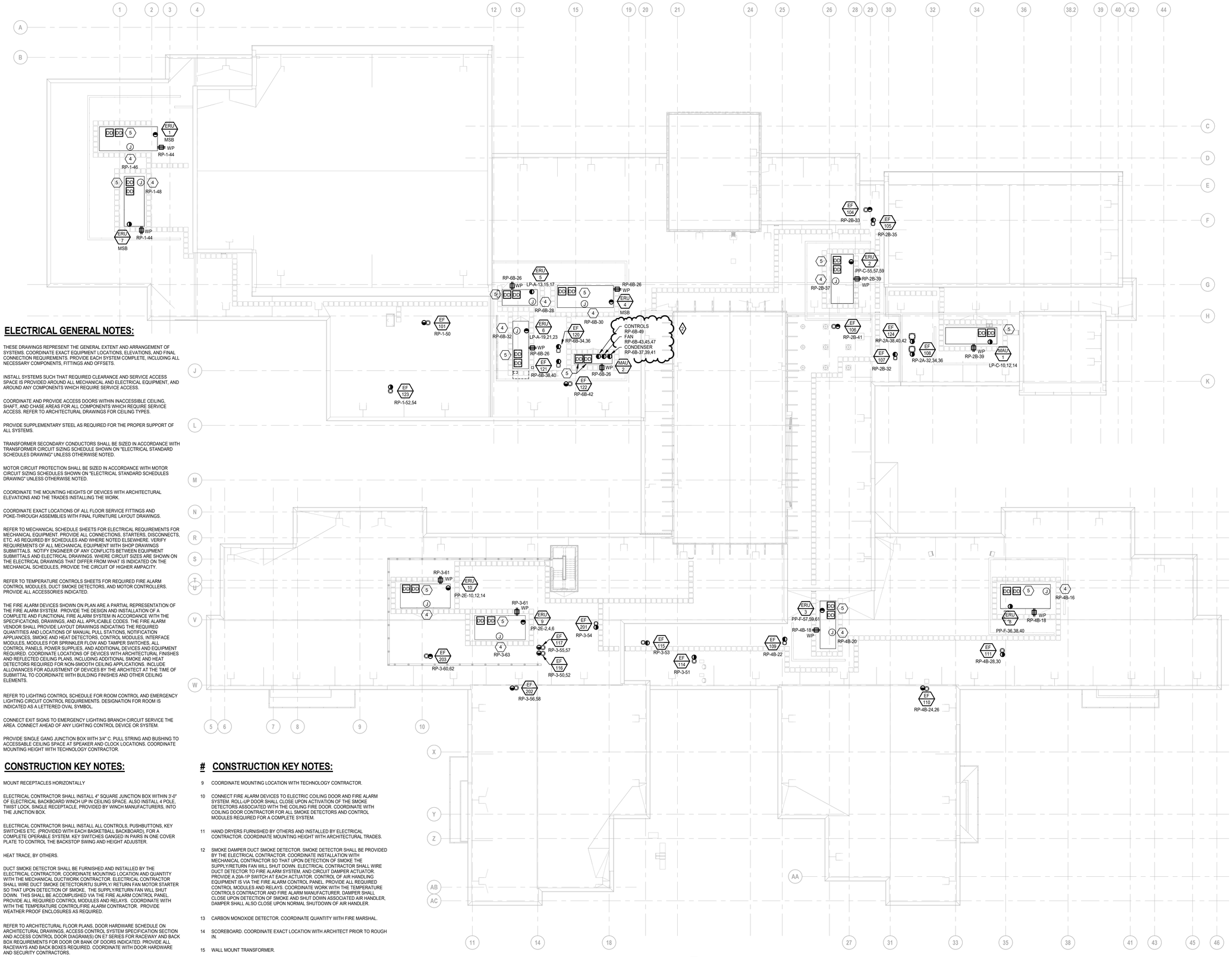

ROOF ELECTRICAL COMPOSITE PLAN

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. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
7. COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
8. COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.
9. 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.
10. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
11. THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.
12. REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
13. CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.
14. PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1. MOUNT RECEPTACLES HORIZONTALLY
2. ELECTRICAL CONTRACTOR SHALL INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF ELECTRICAL BACKBOARD WINCH UP IN CEILING SPACE. ALSO INSTALL 4 POLE, TWIST LOCK, SINGLE RECEPTACLE, PROVIDED BY WINCH MANUFACTURERS, INTO THE JUNCTION BOX.
3. ELECTRICAL CONTRACTOR SHALL INSTALL ALL CONTROLS, PUSHBUTTONS, KEY SWITCHES ETC. (PROVIDED WITH EACH BASKETBALL BACKBOARD), FOR A COMPLETE OPERABLE SYSTEM. KEY SWITCHES GANGED IN PAIRS IN ONE COVER PLATE TO CONTROL THE BACKSTOP SWING AND HEIGHT ADJUSTER.
4. HEAT TRACE, BY OTHERS.
5. 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.
6. REFER TO ARCHITECTURAL FLOOR PLANS, DOOR HARDWARE SCHEDULE ON ARCHITECTURAL DRAWINGS, ACCESS CONTROL SYSTEM SPECIFICATION SECTION AND ACCESS CONTROL DOOR DIAGRAM(S) ON E7 SERIES FOR RACEWAY AND BACK BOX REQUIREMENTS FOR DOOR OR BANK OF DOORS INDICATED. PROVIDE ALL RACEWAYS AND BACK BOXES REQUIRED. COORDINATE WITH DOOR HARDWARE AND SECURITY CONTRACTORS.
7. PROVIDE 2-2" AND 1-1" U.O.N. CONDUITS FOR TECHNOLOGY AND AUXILIARY SYSTEM WIRE AS INDICATED. STUB CONDUITS FROM CEILING SPACE. PROVIDE PLASTIC BUSHINGS AT EACH END. PROVIDE REMOVABLE/RESEALABLE FIRE STOP PUTTY IN EACH CONDUIT AND FIRE STOP AROUND EACH CONDUIT. COORDINATE WITH TECHNOLOGY CONTRACTOR FOR EXACT LOCATION OF CONDUIT. PROVIDE MINIMUM OF 1" CONDUIT FOR ALL OTHER AREAS REQUIRING SLEEVES.
8. PROVIDE (1)2" CONDUIT WITH PULL STRING AND BUSHINGS FOR TECHNOLOGY. ROUTE UNDER BUILDING AND TERMINATE AT EXTERIOR OF BUILDING.

CONSTRUCTION KEY NOTES:

9. COORDINATE MOUNTING LOCATION WITH TECHNOLOGY CONTRACTOR.
10. CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND FIRE ALARM SYSTEM. ROLL-UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.
11. HAND DRYERS FURNISHED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL TRADES.
12. SMOKE DAMPER DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WORK WITH THE TEMPERATURE CONTROLS CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED AIR HANDLER, DAMPER SHALL ALSO CLOSE UPON NORMAL SHUTDOWN OF AIR HANDLER.
13. CARBON MONOXIDE DETECTOR. COORDINATE QUANTITY WITH FIRE MARSHAL.
14. SCOREBOARD. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH IN.
15. WALL MOUNT TRANSFORMER.
16. ELECTRIC RANGE. PROVIDE WALL MOUNTED GFCI MODULE ABOVE COUNTER.
17. LIGHTING RELAY PANEL FOR THEATRICAL LIGHTING SYSTEM. REFER TO THEATRICAL LIGHTING EQUIPMENT DRAWINGS.

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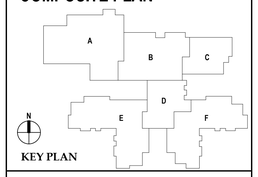
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

ROOF LEVEL ELECTRICAL COMPOSITE PLAN



KEY PLAN

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22102

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FIRST LEVEL LIGHTING PLAN - ZONE 'A'

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

ELECTRICAL GENERAL NOTES:

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2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. 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. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
7. COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
8. COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.
9. 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.
10. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
11. THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.
12. REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
13. CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.
14. PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1. PROVIDE WIRE GUARD FOR LIGHTING CONTROL DEVICES AND EXIT SIGNS IN SPACE.
2. STAGE LIGHTING CONTROL STATION COORDINATE FINAL LOCATION WITH THEATRICAL CONSULTANT.
3. PROVIDE SINGLE GANG BOX WITH 3/4"C. AND PULL STRING TO ACCESSIBLE CEILING FOR DMX CONTROLS. COORDINATE FINAL LOCATION WITH THEATER CONSULTANT.
4. STAGE LIGHTING ELECTRIC. COORDINATE FINAL LOCATIONS WITH THEATRICAL CONSULTANT. PROVIDE 3/4" C. TO ERP-24.
5. PROVIDE EMERGENCY BATTERY INSIDE LIGHT FIXTURE. BATTERY SHALL OUTPUT 1,400 LUMENS FOR A MINIMUM OF 90 MINUTES.
6. ARCHITECTURAL PANEL LIGHT BY OTHERS.
7. ELEVATOR HOISTWAY/PIT LIGHTING. REFER TO DETAIL.

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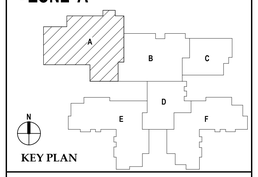
FIRST LEVEL LIGHTING PLAN - ZONE 'A'



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07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
CHECKED	ZDB
APPROVED	STP

PROJECT NO.

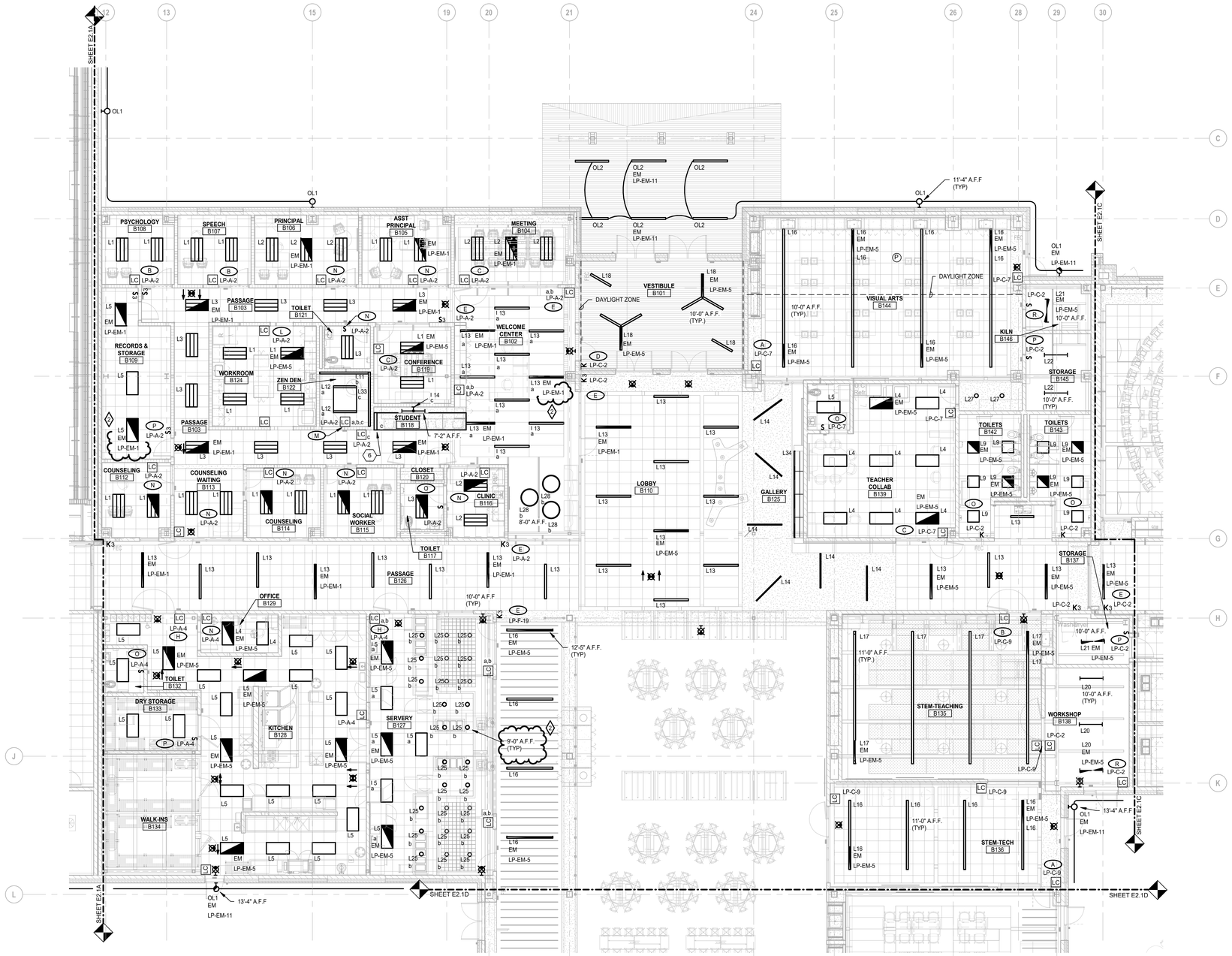
22102

DRAWING NO.

E2.1A

7/11/2024 2:06:45 PM Autodesk Docs://22102_Troy Smith MS/0023-0154_TSD Smith MS_MEP_v22.rvt

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



FIRST LEVEL LIGHTING PLAN - ZONE 'B'

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

ELECTRICAL GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
5. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
7. COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
8. COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.
9. 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.
10. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
11. THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.
12. REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
13. CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.
14. PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1. PROVIDE WIRE GUARD FOR LIGHTING CONTROL DEVICES AND EXIT SIGNS IN SPACE.
2. STAGE LIGHTING CONTROL STATION COORDINATE FINAL LOCATION WITH THEATRICAL CONSULTANT.
3. PROVIDE SINGLE GANG BOX WITH 3/4"C. AND PULL STRING TO ACCESSIBLE CEILING FOR DMX CONTROLS. COORDINATE FINAL LOCATION WITH THEATER CONSULTANT.
4. STAGE LIGHTING ELECTRIC. COORDINATE FINAL LOCATIONS WITH THEATRICAL CONSULTANT. PROVIDE 3/4" C. TO ERP-24.
5. PROVIDE EMERGENCY BATTERY INSIDE LIGHT FIXTURE. BATTERY SHALL OUTPUT 1,400 LUMENS FOR A MINIMUM OF 90 MINUTES.
6. ARCHITECTURAL PANEL LIGHT BY OTHERS.
7. ELEVATOR HOISTWAY/PIT LIGHTING. REFER TO DETAIL.

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www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

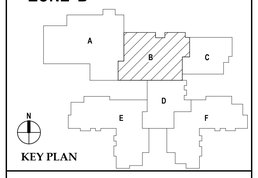
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL LIGHTING PLAN - ZONE 'B'



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7/11/2024 4:18:08 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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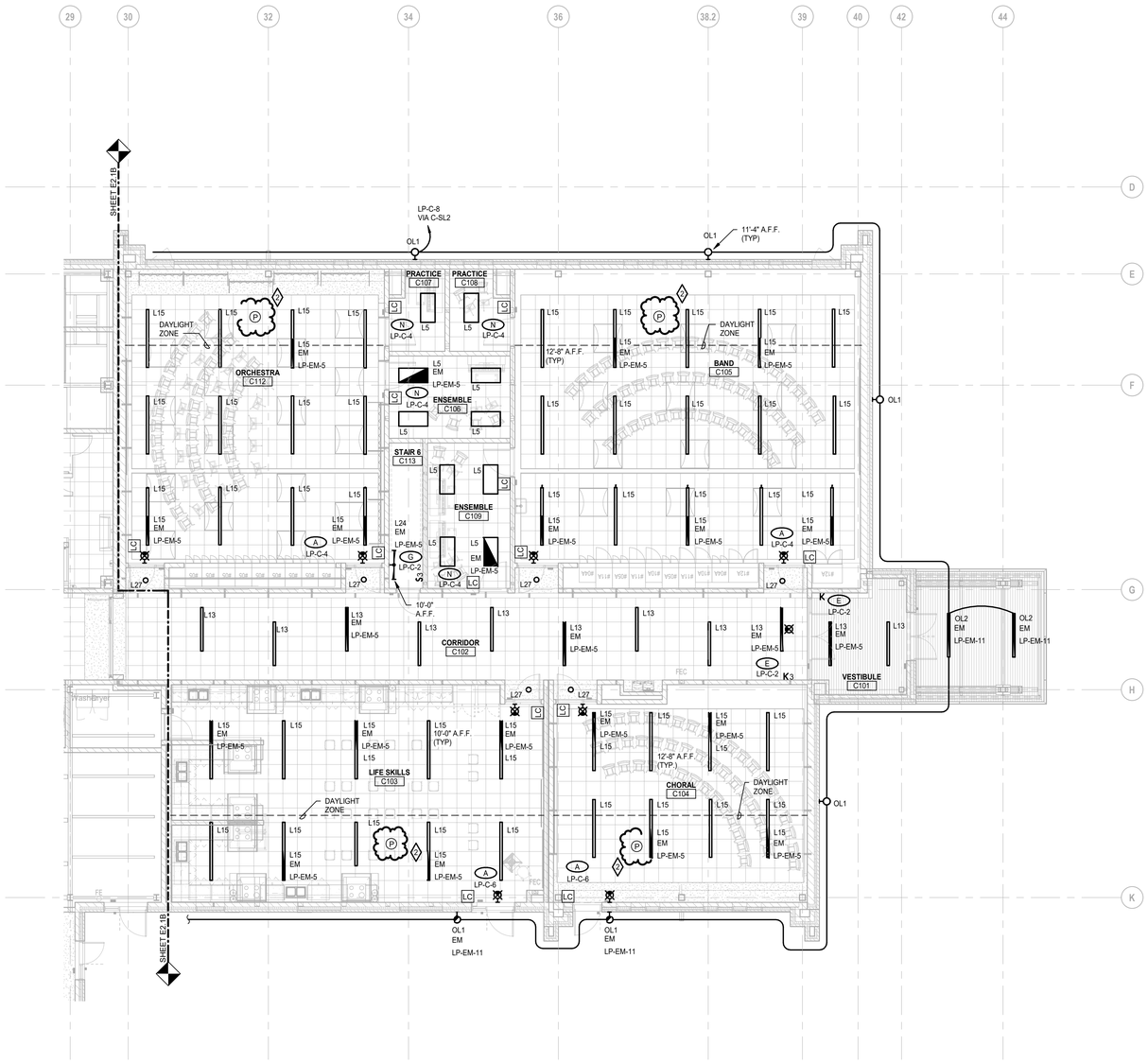

FIRST LEVEL LIGHTING PLAN - ZONE 'C'

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

ELECTRICAL GENERAL NOTES:

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2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 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 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

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7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 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.

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PBA Project No.: 2023.0154

PROJECT TITLE

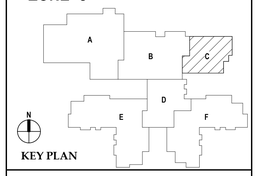
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL LIGHTING PLAN - ZONE 'C'



KEY PLAN

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22102

DRAWING NO.

E2.1C

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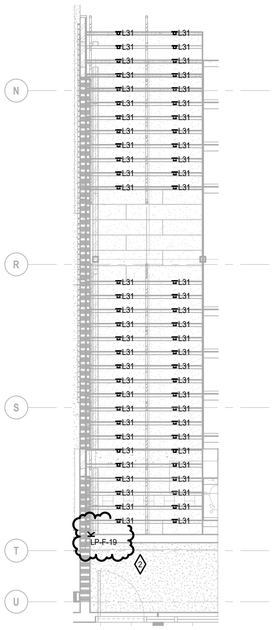
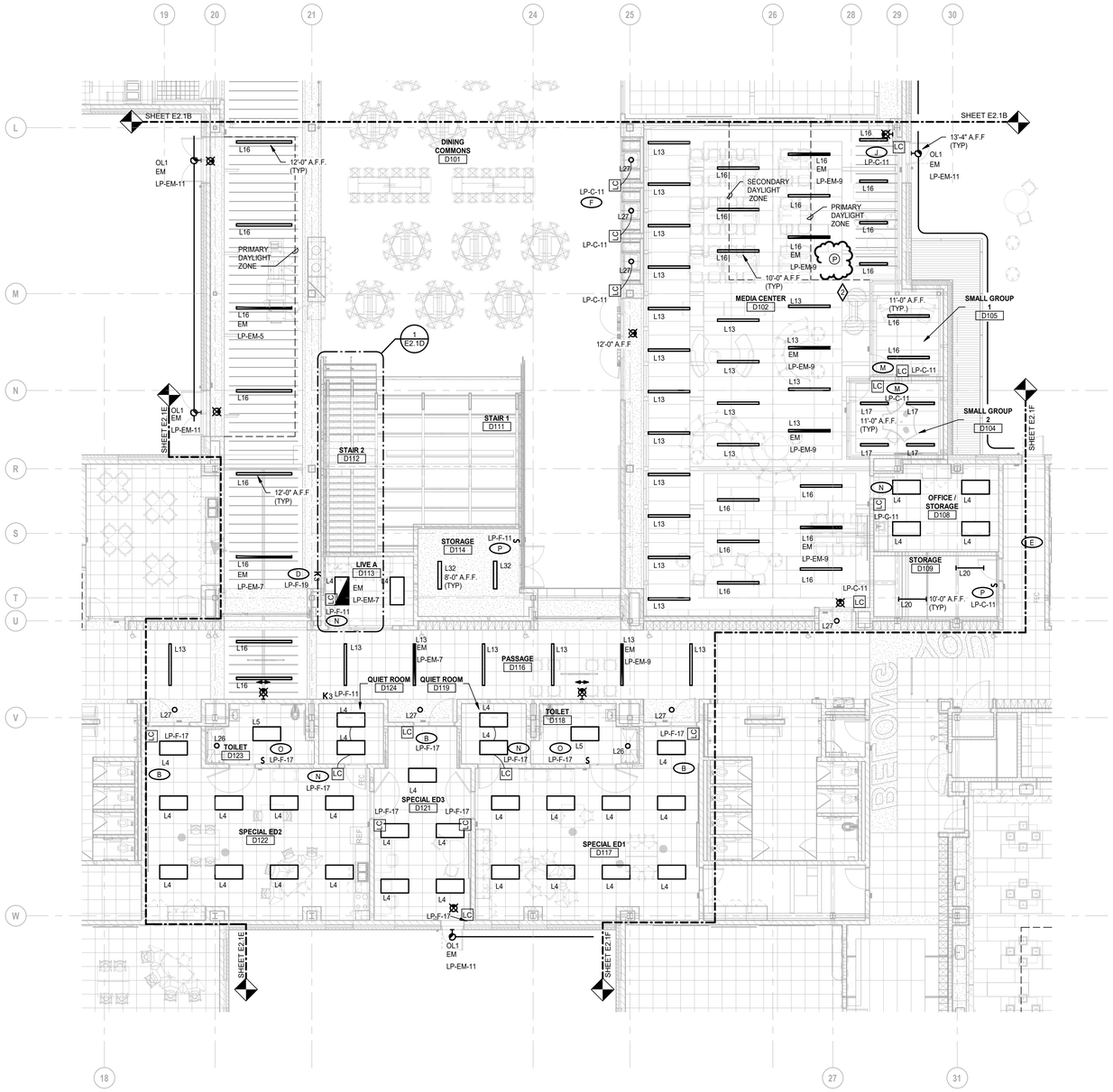


1 / E2.1D **ENLARGED STAIR 2 LIGHTING PLAN**
SCALE: 1/4" = 1'-0"



FIRST LEVEL LIGHTING PLAN - ZONE 'D'
SCALE: 1/8" = 1'-0"

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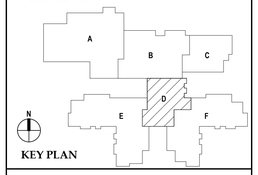
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL LIGHTING PLAN - ZONE 'D'



KEY PLAN

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

FIRST LEVEL LIGHTING PLAN - ZONE 'E'

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ELECTRICAL GENERAL NOTES:

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CONSTRUCTION KEY NOTES:

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TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

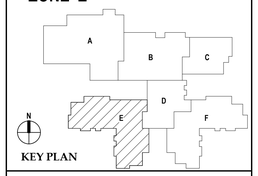
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL LIGHTING PLAN - ZONE 'E'



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22102

DRAWING NO.

E2.1E

7/11/2024 2:08:02 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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

FIRST LEVEL LIGHTING PLAN - ZONE 'F'

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

ELECTRICAL GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
5. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
7. COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
8. COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.
9. 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.
10. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
11. THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.
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13. CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.
14. PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1. PROVIDE WIRE GUARD FOR LIGHTING CONTROL DEVICES AND EXIT SIGNS IN SPACE.
2. STAGE LIGHTING CONTROL STATION COORDINATE FINAL LOCATION WITH THEATRICAL CONSULTANT.
3. PROVIDE SINGLE GANG BOX WITH 3/4"C. AND PULL STRING TO ACCESSIBLE CEILING FOR DMX CONTROLS. COORDINATE FINAL LOCATION WITH THEATER CONSULTANT.
4. STAGE LIGHTING ELECTRIC. COORDINATE FINAL LOCATIONS WITH THEATRICAL CONSULTANT. PROVIDE 3/4" C. TO ERP-24.
5. PROVIDE EMERGENCY BATTERY INSIDE LIGHT FIXTURE. BATTERY SHALL OUTPUT 1,400 LUMENS FOR A MINIMUM OF 90 MINUTES.
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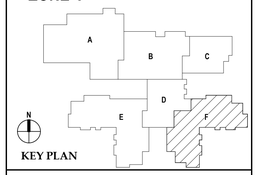
FIRST LEVEL LIGHTING PLAN - ZONE 'F'



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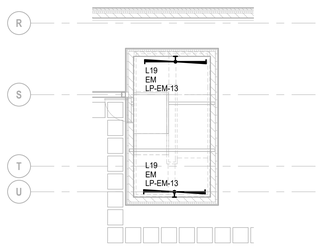
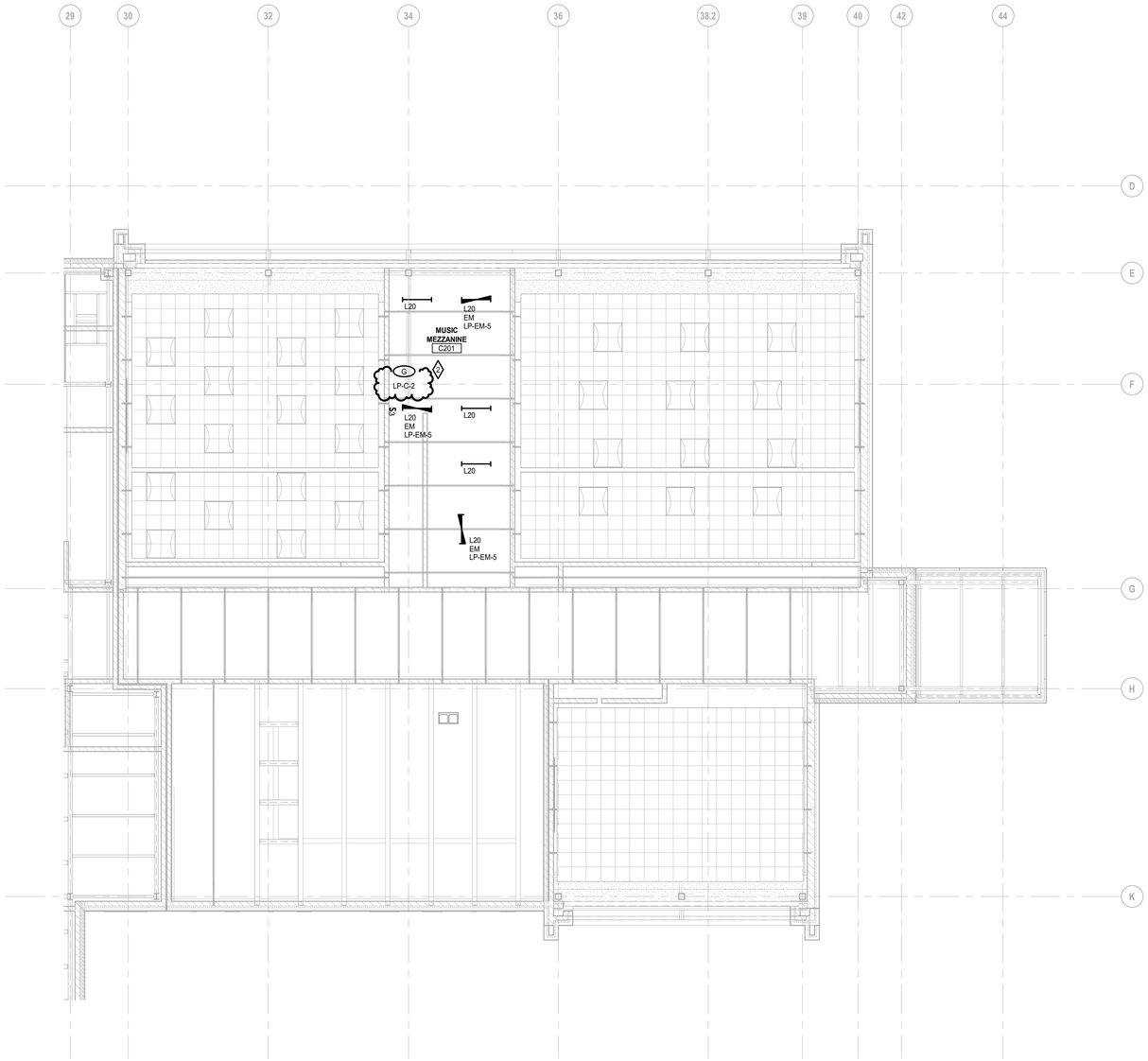


STAIR 3 LIGHTING PLAN - ZONE 'E'

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



MEZZANINE LEVEL LIGHTING PLAN - ZONE 'C'

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4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

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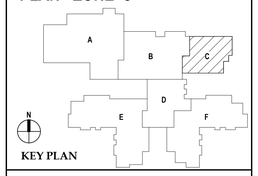
MEZZANINE LEVEL LIGHTING PLAN - ZONE 'C'



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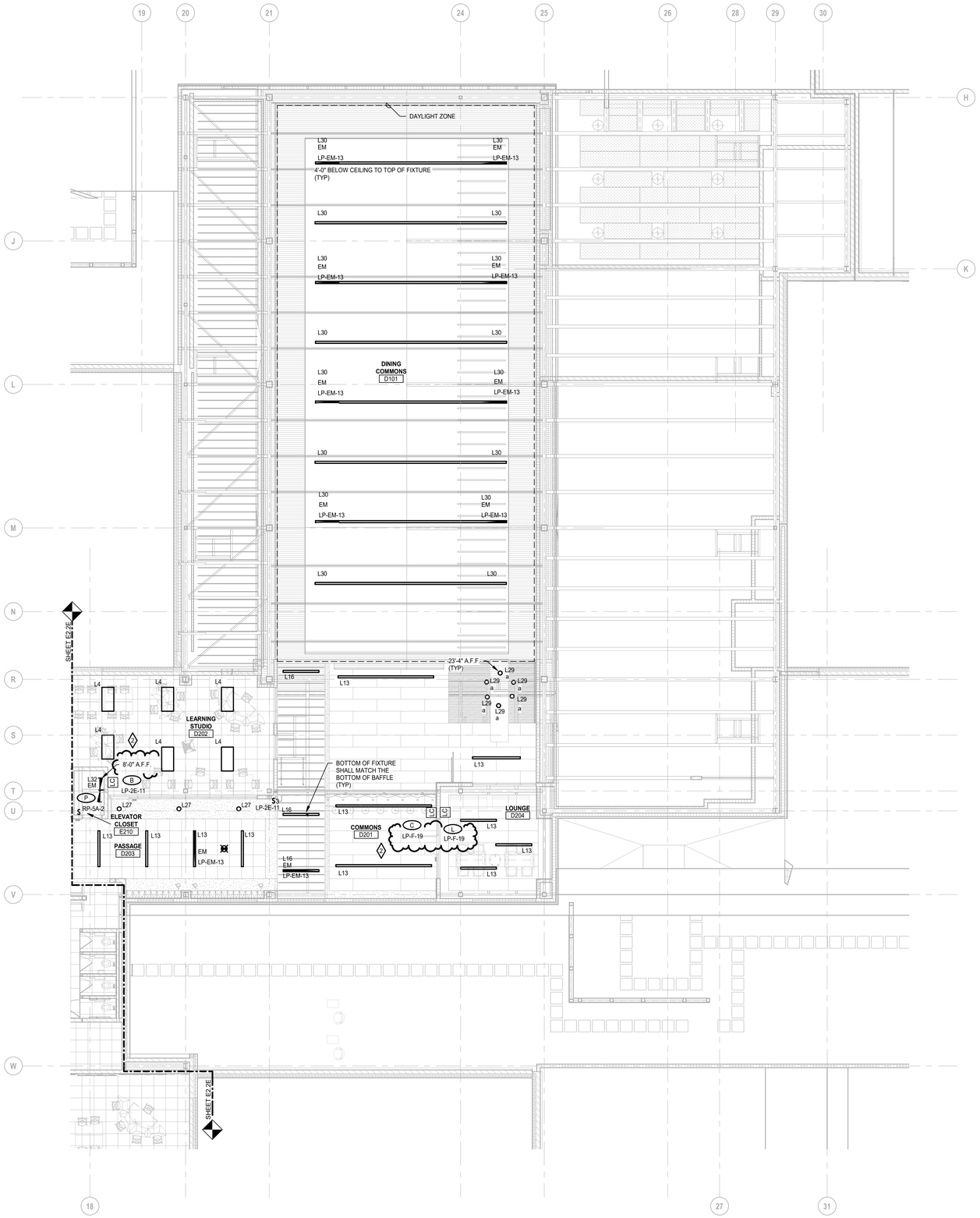

SECOND LEVEL LIGHTING PLAN - ZONE 'D'

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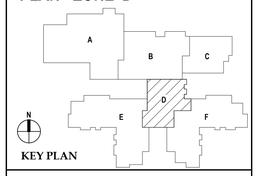

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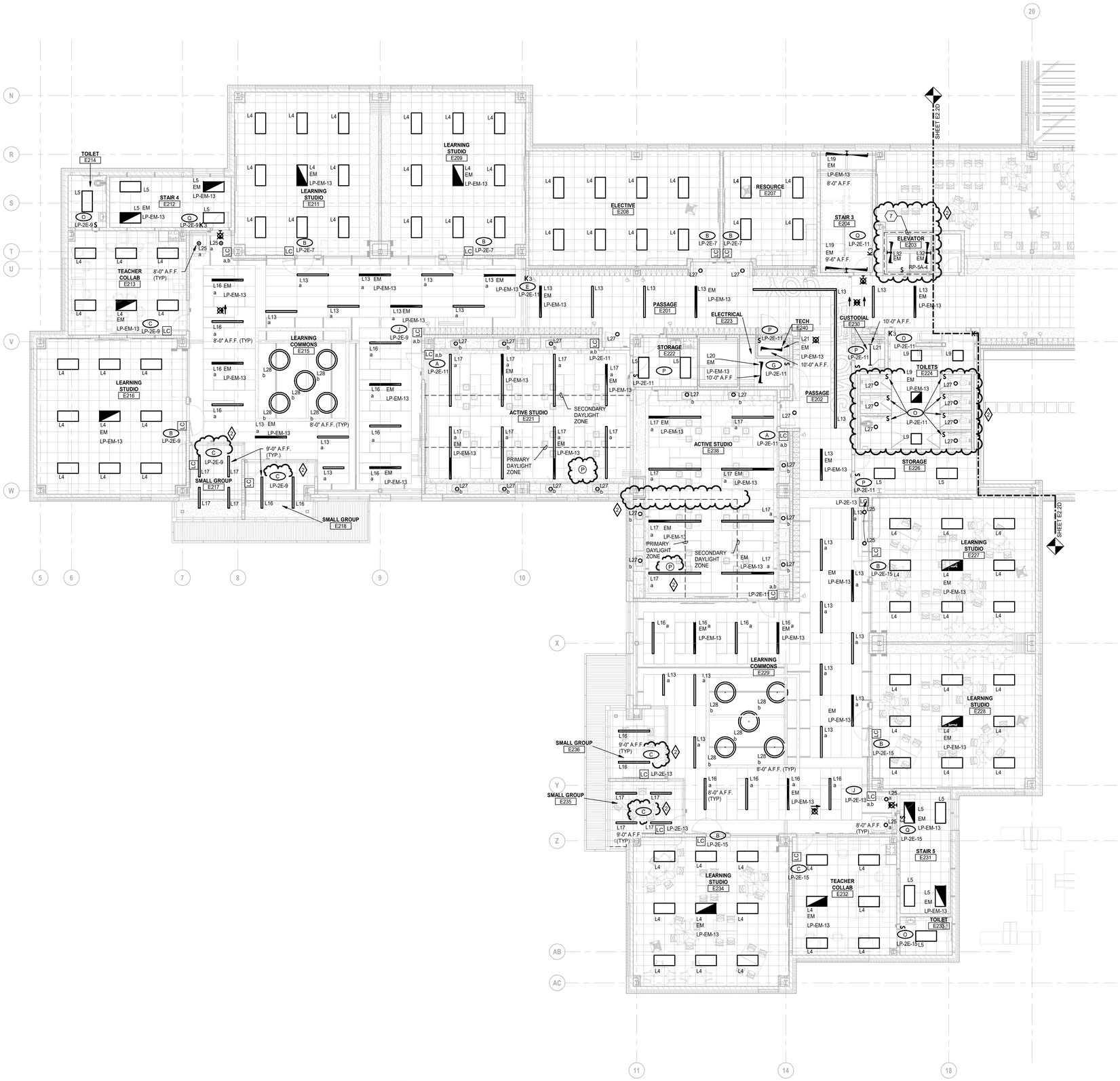

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10. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
11. THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.
12. REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
13. CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.
14. PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1. PROVIDE WIRE GUARD FOR LIGHTING CONTROL DEVICES AND EXIT SIGNS IN SPACE.
2. STAGE LIGHTING CONTROL STATION COORDINATE FINAL LOCATION WITH THEATRICAL CONSULTANT.
3. PROVIDE SINGLE GANG BOX WITH 3/4"C. AND PULL STRING TO ACCESSIBLE CEILING FOR DMX CONTROLS. COORDINATE FINAL LOCATION WITH THEATER CONSULTANT.
4. STAGE LIGHTING ELECTRIC. COORDINATE FINAL LOCATIONS WITH THEATRICAL CONSULTANT. PROVIDE 3/4" C. TO ERP-24.
5. PROVIDE EMERGENCY BATTERY INSIDE LIGHT FIXTURE. BATTERY SHALL OUTPUT 1,400 LUMENS FOR A MINIMUM OF 90 MINUTES.
6. ARCHITECTURAL PANEL LIGHT BY OTHERS.
7. ELEVATOR HOISTWAY/PIT LIGHTING. REFER TO DETAIL. 7

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PROJECT TITLE

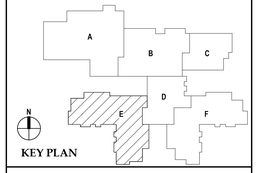
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL LIGHTING PLAN - ZONE 'E'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
CHECKED	ZDB
APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

E2.2E

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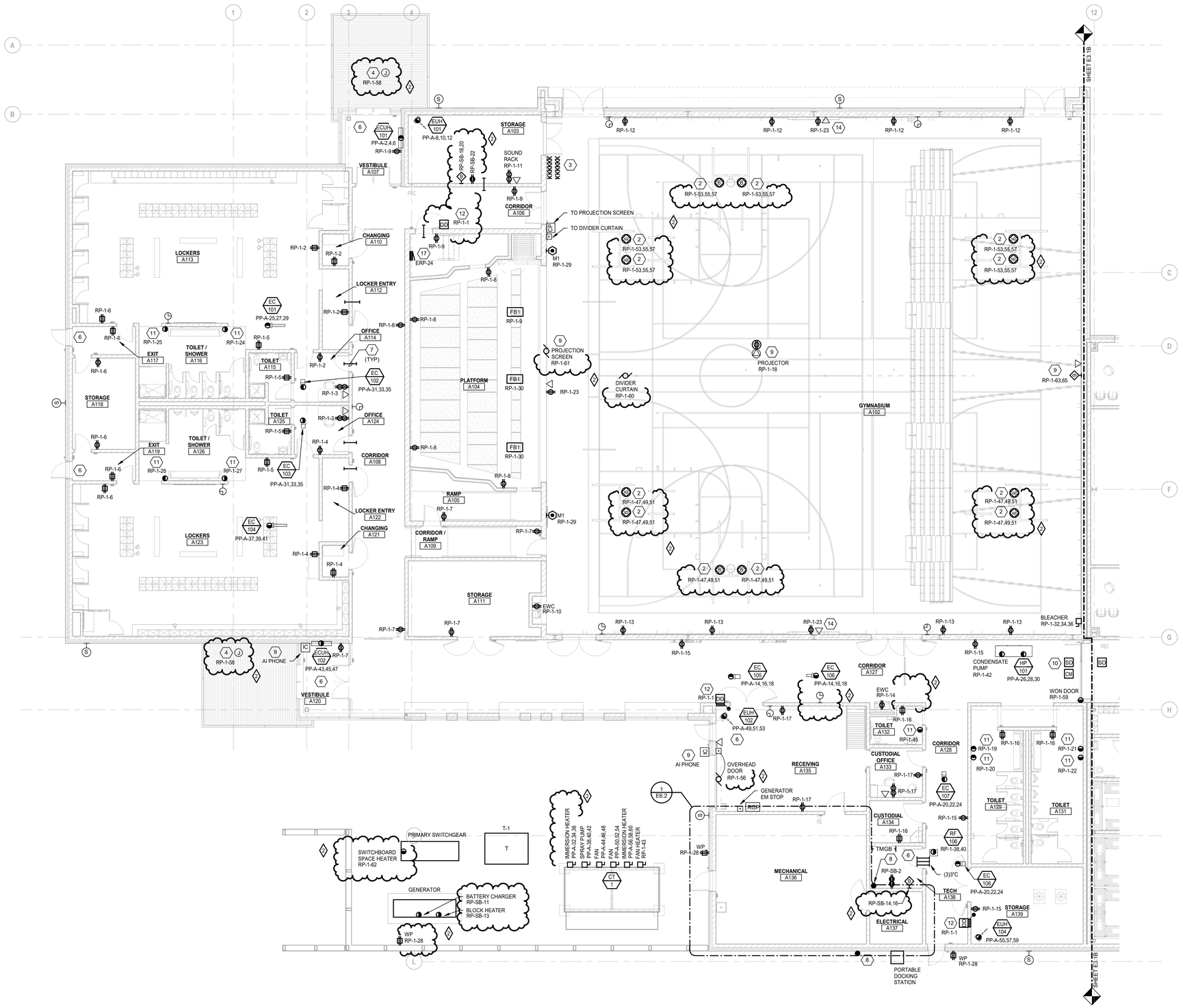
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'A'

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

ELECTRICAL GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
5. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
7. COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
8. COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.
9. 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.
10. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
11. THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.
12. REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
13. CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.
14. PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1. MOUNT RECEPTACLES HORIZONTALLY
2. ELECTRICAL CONTRACTOR SHALL INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF ELECTRICAL BACKBOARD WINCH UP IN CEILING SPACE. ALSO INSTALL 4 POLE, TWIST LOCK, SINGLE RECEPTACLE, PROVIDED BY WINCH MANUFACTURERS, INTO THE JUNCTION BOX.
3. ELECTRICAL CONTRACTOR SHALL INSTALL ALL CONTROLS, PUSHBUTTONS, KEY SWITCHES ETC. (PROVIDED WITH EACH BASKETBALL BACKBOARD), FOR A COMPLETE OPERABLE SYSTEM. KEY SWITCHES GANGED IN PAIRS IN ONE COVER PLATE TO CONTROL THE BACKSTOP SWING AND HEIGHT ADJUSTER.
4. HEAT TRACE, BY OTHERS.
5. 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.
6. REFER TO ARCHITECTURAL FLOOR PLANS, DOOR HARDWARE SCHEDULE ON ARCHITECTURAL DRAWINGS, ACCESS CONTROL SYSTEM SPECIFICATION SECTION AND ACCESS CONTROL DOOR DIAGRAM(S) ON E7 SERIES FOR RACEWAY AND BACK BOX REQUIREMENTS FOR DOOR OR BANK OF DOORS INDICATED. PROVIDE ALL RACEWAYS AND BACK BOXES REQUIRED. COORDINATE WITH DOOR HARDWARE AND SECURITY CONTRACTORS.
7. PROVIDE 2-2" AND 1-1" U.O.N. CONDUITS FOR TECHNOLOGY AND AUXILIARY SYSTEM WIRE AS INDICATED. STUB CONDUITS FROM CEILING SPACE. PROVIDE PLASTIC BUSHINGS AT EACH END. PROVIDE REMOVABLE/RESEALABLE FIRE STOP PUTTY IN EACH CONDUIT AND FIRE STOP AROUND EACH CONDUIT. COORDINATE WITH TECHNOLOGY CONTRACTOR FOR EXACT LOCATION OF CONDUIT. PROVIDE MINIMUM OF 1" CONDUIT FOR ALL OTHER AREAS REQUIRING SLEEVES.
8. PROVIDE (12)" CONDUIT WITH PULL STRING AND BUSHINGS FOR TECHNOLOGY. ROUTE UNDER BUILDING AND TERMINATE AT EXTERIOR OF BUILDING.
9. COORDINATE MOUNTING LOCATION WITH TECHNOLOGY CONTRACTOR.
10. CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND FIRE ALARM SYSTEM. ROLL-UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.
11. HAND DRYERS FURNISHED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL TRADES.
12. SMOKE DAMPER DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WORK WITH THE TEMPERATURE CONTROLS CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED AIR HANDLER, DAMPER SHALL ALSO CLOSE UPON NORMAL SHUTDOWN OF AIR HANDLER.
13. CARBON MONOXIDE DETECTOR. COORDINATE QUANTITY WITH FIRE MARSHAL.
14. SCOREBOARD. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH IN.
15. WALL MOUNT TRANSFORMER.
16. ELECTRIC RANGE. PROVIDE WALL MOUNTED GFCI MODULE ABOVE COUNTER.
17. LIGHTING RELAY PANEL FOR THEATRICAL LIGHTING SYSTEM. REFER TO THEATRICAL LIGHTING EQUIPMENT DRAWINGS.

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PBA Project No.: 2023.0154

PROJECT TITLE

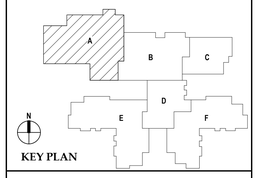
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'A'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
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06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
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PROJECT NO.

22102

DRAWING NO.

E3.1A

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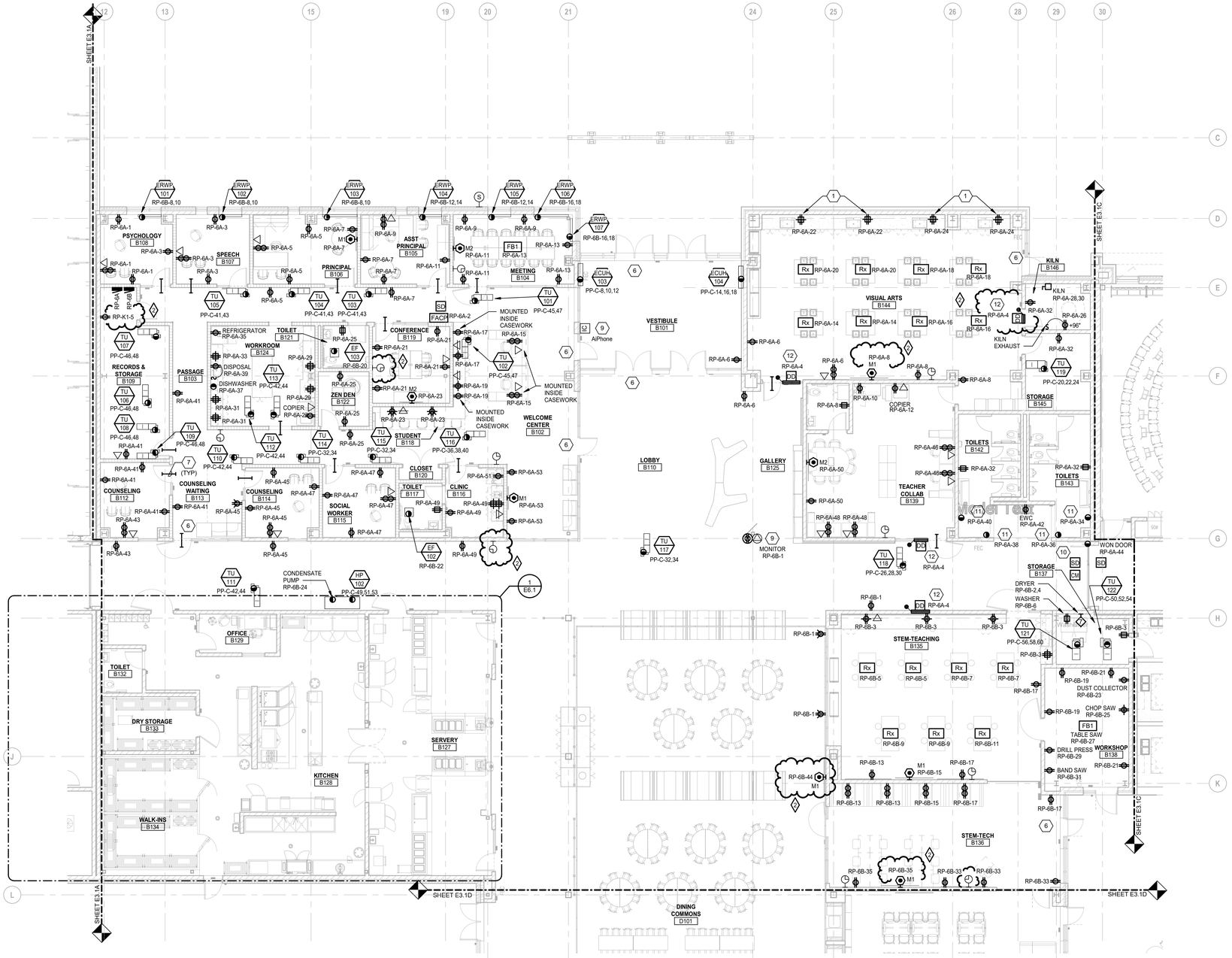

FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'B'

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

ELECTRICAL GENERAL NOTES:

1 THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

5 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 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.

10 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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12 REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

13 CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.

14 PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1 MOUNT RECEPTACLES HORIZONTALLY

2 ELECTRICAL CONTRACTOR SHALL INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF ELECTRICAL BACKBOARD WINCH UP IN CEILING SPACE. ALSO INSTALL 4 POLE, TWIST LOCK, SINGLE RECEPTACLE, PROVIDED BY WINCH MANUFACTURERS, INTO THE JUNCTION BOX.

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5 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.

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7 PROVIDE 2-2" AND 1-1" U.O.N. CONDUITS FOR TECHNOLOGY AND AUXILIARY SYSTEM WIRE AS INDICATED. STUB CONDUITS FROM CEILING SPACE. PROVIDE PLASTIC BUSHINGS AT EACH END. PROVIDE REMOVABLE/RESEALABLE FIRE STOP PUTTY IN EACH CONDUIT AND FIRE STOP AROUND EACH CONDUIT. COORDINATE WITH TECHNOLOGY CONTRACTOR FOR EXACT LOCATION OF CONDUIT. PROVIDE MINIMUM OF 1" CONDUIT FOR ALL OTHER AREAS REQUIRING SLEEVES.

8 PROVIDE (12" CONDUIT WITH PULL STRING AND BUSHINGS FOR TECHNOLOGY. ROUTE UNDER BUILDING AND TERMINATE AT EXTERIOR OF BUILDING.

9 COORDINATE MOUNTING LOCATION WITH TECHNOLOGY CONTRACTOR.

10 CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND FIRE ALARM SYSTEM. ROLL-UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.

11 HAND DRYERS FURNISHED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL TRADES.

12 SMOKE DAMPER DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WORK WITH THE TEMPERATURE CONTROLS CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED AIR HANDLER, DAMPER SHALL ALSO CLOSE UPON NORMAL SHUTDOWN OF AIR HANDLER.

13 CARBON MONOXIDE DETECTOR. COORDINATE QUANTITY WITH FIRE MARSHAL.

14 SCOREBOARD. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH IN.

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PBA Project No.: 2023.0154

PROJECT TITLE

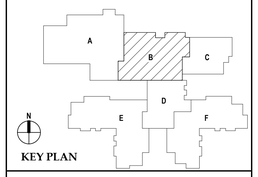
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'B'



KEY PLAN

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DRAWN	DDS
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PROJECT NO.

22102

DRAWING NO.

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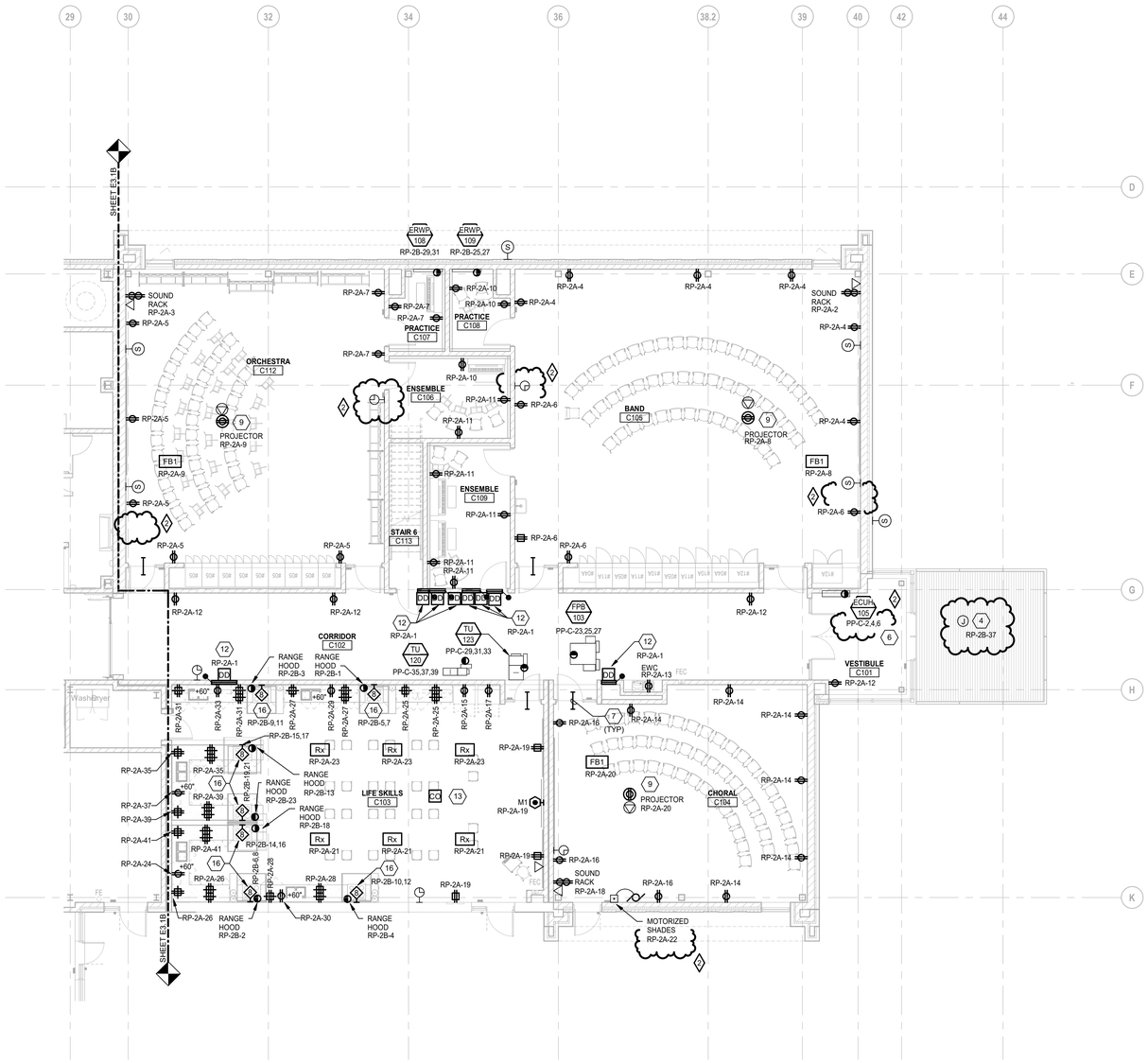

FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'C'

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

ELECTRICAL GENERAL NOTES:

1 THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.

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4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

5 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 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.

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11 THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.

12 REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

13 CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.

14 PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1 MOUNT RECEPTACLES HORIZONTALLY

2 ELECTRICAL CONTRACTOR SHALL INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF ELECTRICAL BACKBOARD WINCH UP IN CEILING SPACE. ALSO INSTALL 4 POLE, TWIST LOCK, SINGLE RECEPTACLE, PROVIDED BY WINCH MANUFACTURERS, INTO THE JUNCTION BOX.

3 ELECTRICAL CONTRACTOR SHALL INSTALL ALL CONTROLS, PUSHBUTTONS, KEY SWITCHES ETC. (PROVIDED WITH EACH BASKETBALL BACKBOARD). FOR A COMPLETE OPERABLE SYSTEM. KEY SWITCHES GANGED IN PAIRS IN ONE COVER PLATE TO CONTROL THE BACKSTOP SWING AND HEIGHT ADJUSTER.

4 HEAT TRACE, BY OTHERS.

5 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.

6 REFER TO ARCHITECTURAL FLOOR PLANS, DOOR HARDWARE SCHEDULE ON ARCHITECTURAL DRAWINGS, ACCESS CONTROL SYSTEM SPECIFICATION SECTION AND ACCESS CONTROL DOOR DIAGRAM(S) ON E7 SERIES FOR RACEWAY AND BACK BOX REQUIREMENTS FOR DOOR OR BANK OF DOORS INDICATED. PROVIDE ALL RACEWAYS AND BACK BOXES REQUIRED. COORDINATE WITH DOOR HARDWARE AND SECURITY CONTRACTORS.

7 PROVIDE 2-2" AND 1-1" U.O.N. CONDUITS FOR TECHNOLOGY AND AUXILIARY SYSTEM WIRE AS INDICATED. STUB CONDUITS FROM CEILING SPACE. PROVIDE PLASTIC BUSHINGS AT EACH END. PROVIDE REMOVABLE/RESEALABLE FIRE STOP PUTTY IN EACH CONDUIT AND FIRE STOP AROUND EACH CONDUIT. COORDINATE WITH TECHNOLOGY CONTRACTOR FOR EXACT LOCATION OF CONDUIT. PROVIDE MINIMUM OF 1" CONDUIT FOR ALL OTHER AREAS REQUIRING SLEEVES.

8 PROVIDE (1)2" CONDUIT WITH PULL STRING AND BUSHINGS FOR TECHNOLOGY. ROUTE UNDER BUILDING AND TERMINATE AT EXTERIOR OF BUILDING.

9 COORDINATE MOUNTING LOCATION WITH TECHNOLOGY CONTRACTOR.

10 CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND FIRE ALARM SYSTEM. ROLL-UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.

11 HAND DRYERS FURNISHED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL TRADES.

12 SMOKE DAMPER DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WORK WITH THE TEMPERATURE CONTROLS CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED AIR HANDLER, DAMPER SHALL ALSO CLOSE UPON NORMAL SHUTDOWN OF AIR HANDLER.

13 CARBON MONOXIDE DETECTOR. COORDINATE QUANTITY WITH FIRE MARSHAL.

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17 LIGHTING RELAY PANEL FOR THEATRICAL LIGHTING SYSTEM. REFER TO THEATRICAL LIGHTING EQUIPMENT DRAWINGS.

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PBA Project No.: 2023.0154

PROJECT TITLE

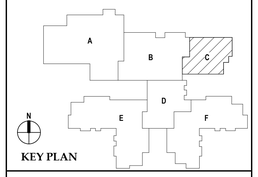
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'C'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
CHECKED	ZDB
APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

E3.1C

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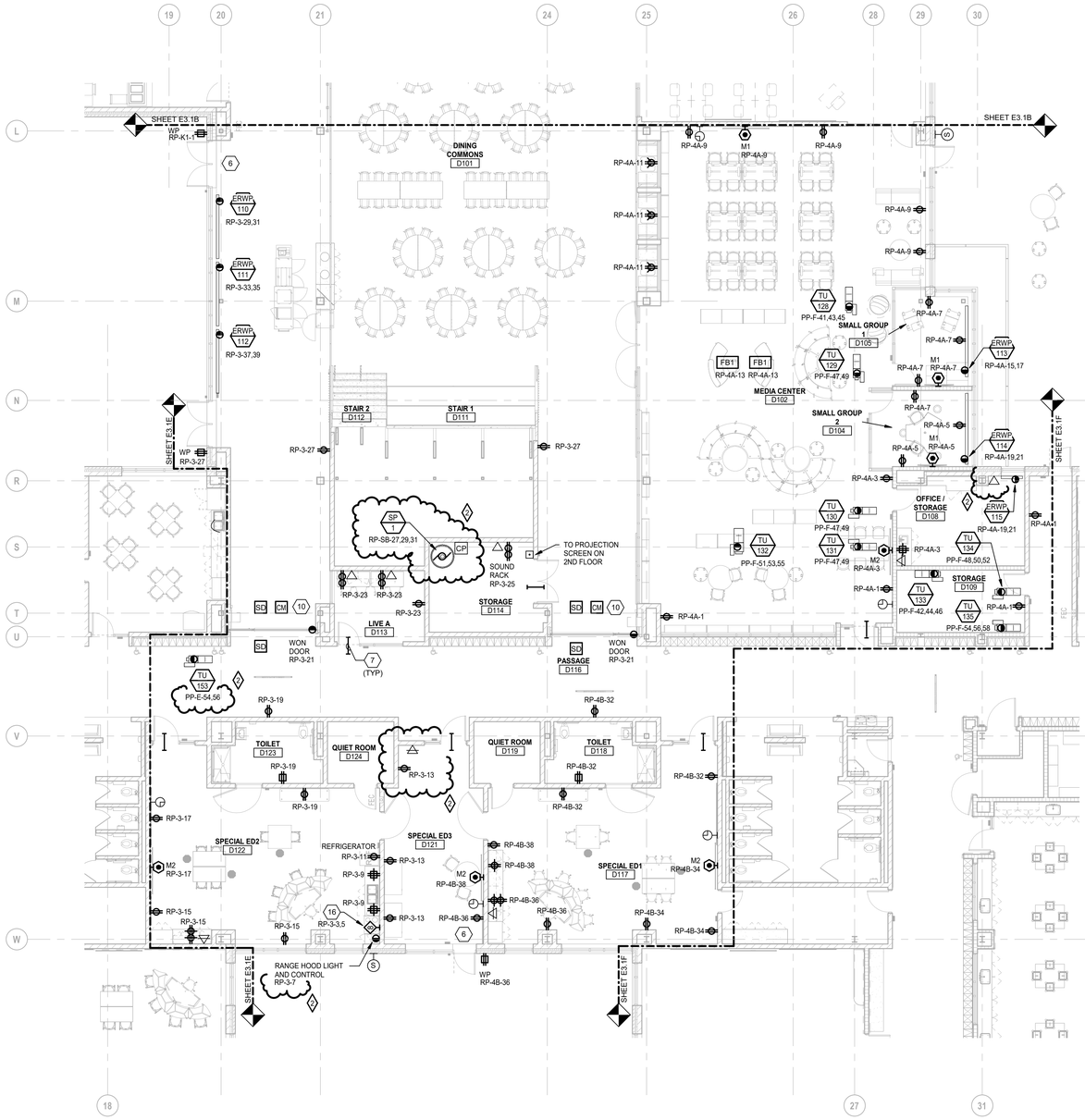
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'D'

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

ELECTRICAL GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
5. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
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8. PROVIDE (1)2" CONDUIT WITH PULL STRING AND BUSHINGS FOR TECHNOLOGY. ROUTE UNDER BUILDING AND TERMINATE AT EXTERIOR OF BUILDING.
9. COORDINATE MOUNTING LOCATION WITH TECHNOLOGY CONTRACTOR.
10. CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND FIRE ALARM SYSTEM. ROLL-UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.
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PBA Project No.: 2023.0154

PROJECT TITLE

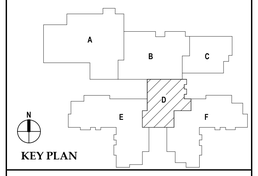
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'D'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
CHECKED	ZDB
APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

E3.1D

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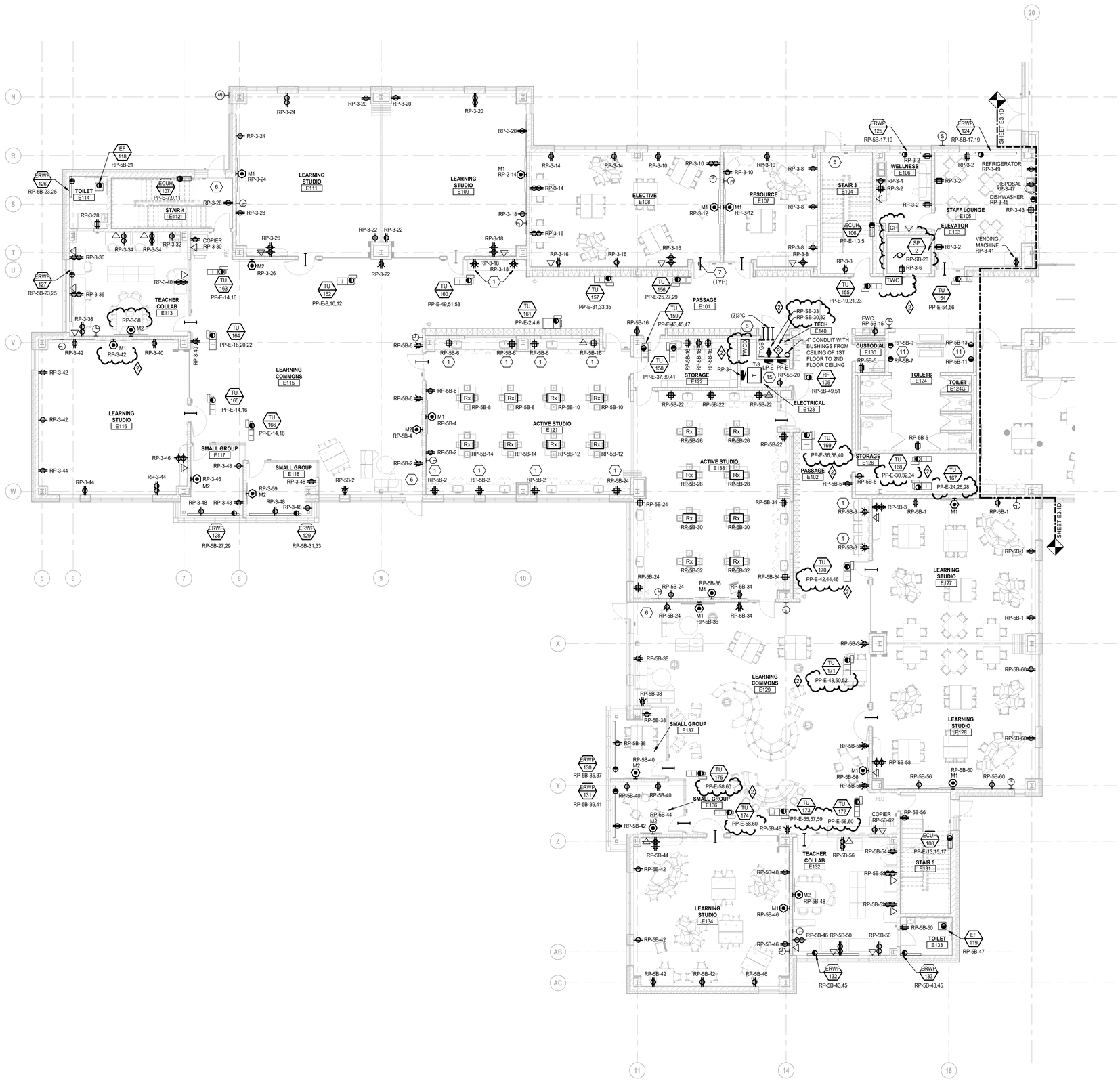

FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'E'

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

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CONSTRUCTION KEY NOTES:

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10. CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND FIRE ALARM SYSTEM. ROLL-UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.
11. HAND DRYERS FURNISHED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL TRADES.
12. SMOKE DAMPER DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WORK WITH THE TEMPERATURE CONTROLS CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED AIR HANDLER, DAMPER SHALL ALSO CLOSE UPON NORMAL SHUTDOWN OF AIR HANDLER.
13. CARBON MONOXIDE DETECTOR. COORDINATE QUANTITY WITH FIRE MARSHAL.
14. SCOREBOARD. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH IN.
15. WALL MOUNT TRANSFORMER.
16. ELECTRIC RANGE. PROVIDE WALL MOUNTED GFCI MODULE ABOVE COUNTER.
17. LIGHTING RELAY PANEL FOR THEATRICAL LIGHTING SYSTEM. REFER TO THEATRICAL LIGHTING EQUIPMENT DRAWINGS.

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PROJECT TITLE

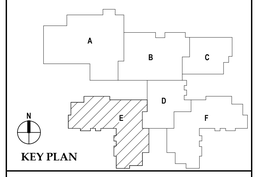
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'E'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
CHECKED	ZDB
APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

E3.1E

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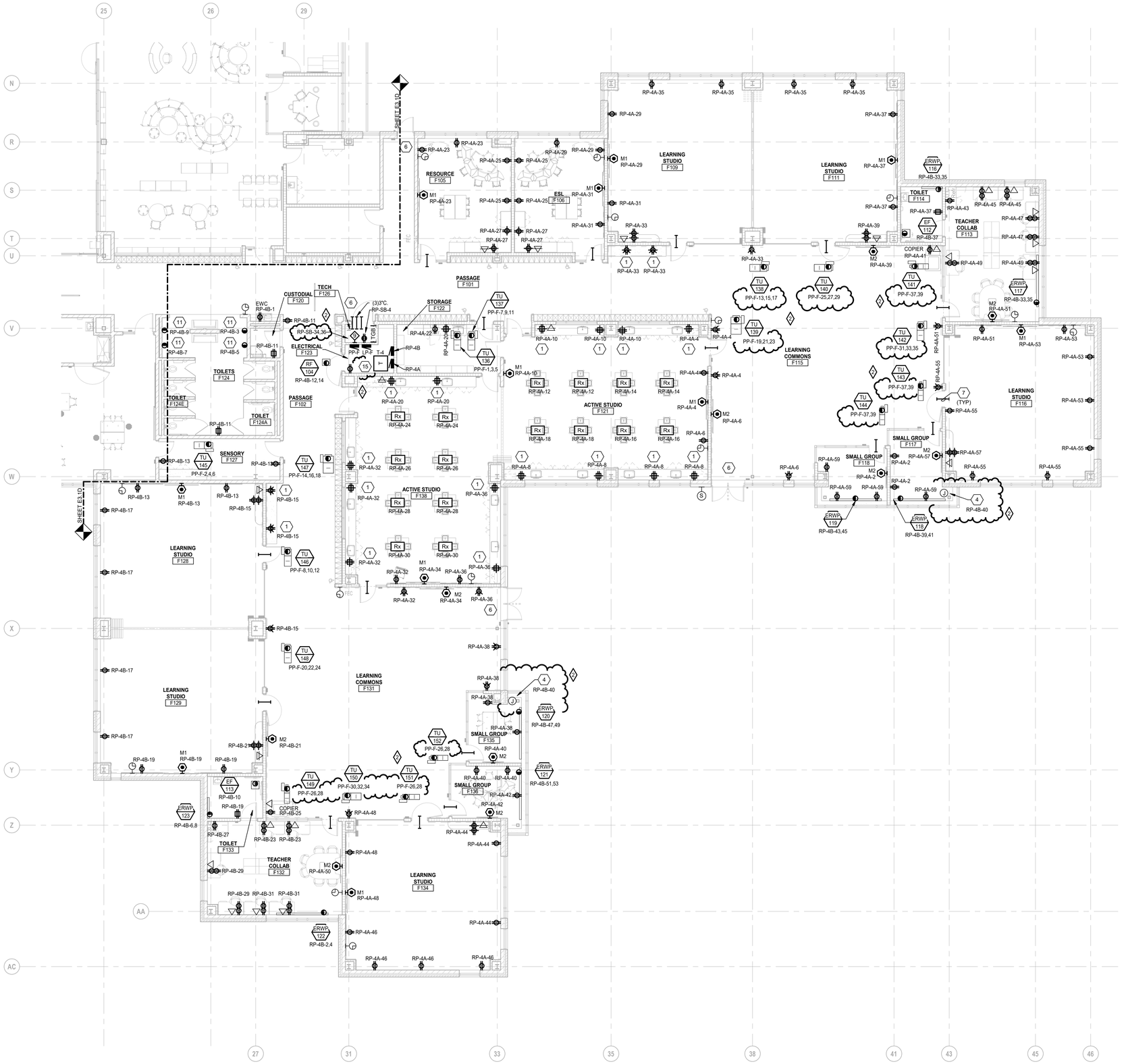

FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'F'

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

ELECTRICAL GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
5. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
7. COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
8. COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.
9. 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.
10. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
11. THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.
12. REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
13. CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.
14. PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1. MOUNT RECEPTACLES HORIZONTALLY
2. ELECTRICAL CONTRACTOR SHALL INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF ELECTRICAL BACKBOARD WINCH UP IN CEILING SPACE. ALSO INSTALL 4 POLE, TWIST LOCK, SINGLE RECEPTACLE, PROVIDED BY WINCH MANUFACTURERS, INTO THE JUNCTION BOX.
3. ELECTRICAL CONTRACTOR SHALL INSTALL ALL CONTROLS, PUSHBUTTONS, KEY SWITCHES ETC. (PROVIDED WITH EACH BASKETBALL BACKBOARD), FOR A COMPLETE OPERABLE SYSTEM. KEY SWITCHES GANGED IN PAIRS IN ONE COVER PLATE TO CONTROL THE BACKSTOP SWING AND HEIGHT ADJUSTER.
4. HEAT TRACE, BY OTHERS.
5. 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.
6. REFER TO ARCHITECTURAL FLOOR PLANS, DOOR HARDWARE SCHEDULE ON ARCHITECTURAL DRAWINGS, ACCESS CONTROL SYSTEM SPECIFICATION SECTION AND ACCESS CONTROL DOOR DIAGRAM(S) ON E7 SERIES FOR RACEWAY AND BACK BOX REQUIREMENTS FOR DOOR OR BANK OF DOORS INDICATED. PROVIDE ALL RACEWAYS AND BACK BOXES REQUIRED. COORDINATE WITH DOOR HARDWARE AND SECURITY CONTRACTORS.
7. PROVIDE 2-2" AND 1-1" U.O.N. CONDUITS FOR TECHNOLOGY AND AUXILIARY SYSTEM WIRE AS INDICATED. STUB CONDUITS FROM CEILING SPACE. PROVIDE PLASTIC BUSHINGS AT EACH END. PROVIDE REMOVABLE/RESEALABLE FIRE STOP PUTTY IN EACH CONDUIT AND FIRE STOP AROUND EACH CONDUIT. COORDINATE WITH TECHNOLOGY CONTRACTOR FOR EXACT LOCATION OF CONDUIT. PROVIDE MINIMUM OF 1" CONDUIT FOR ALL OTHER AREAS REQUIRING SLEEVES.
8. PROVIDE (1)2" CONDUIT WITH PULL STRING AND BUSHINGS FOR TECHNOLOGY. ROUTE UNDER BUILDING AND TERMINATE AT EXTERIOR OF BUILDING.
9. COORDINATE MOUNTING LOCATION WITH TECHNOLOGY CONTRACTOR.
10. CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND FIRE ALARM SYSTEM. ROLL-UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.
11. HAND DRYERS FURNISHED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL TRADES.
12. SMOKE DAMPER DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WORK WITH THE TEMPERATURE CONTROLS CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED AIR HANDLER, DAMPER SHALL ALSO CLOSE UPON NORMAL SHUTDOWN OF AIR HANDLER.
13. CARBON MONOXIDE DETECTOR. COORDINATE QUANTITY WITH FIRE MARSHAL.
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15. WALL MOUNT TRANSFORMER.
16. ELECTRIC RANGE. PROVIDE WALL MOUNTED GFCI MODULE ABOVE COUNTER.
17. LIGHTING RELAY PANEL FOR THEATRICAL LIGHTING SYSTEM. REFER TO THEATRICAL LIGHTING EQUIPMENT DRAWINGS.

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PBA Project No.: 2023.0154

PROJECT TITLE

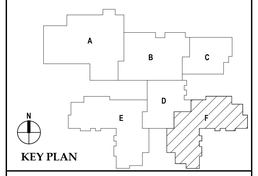
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'F'



KEY PLAN

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DATE:	ISSUED FOR:
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06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
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PROJECT NO.

22102

DRAWING NO.

E3.1F

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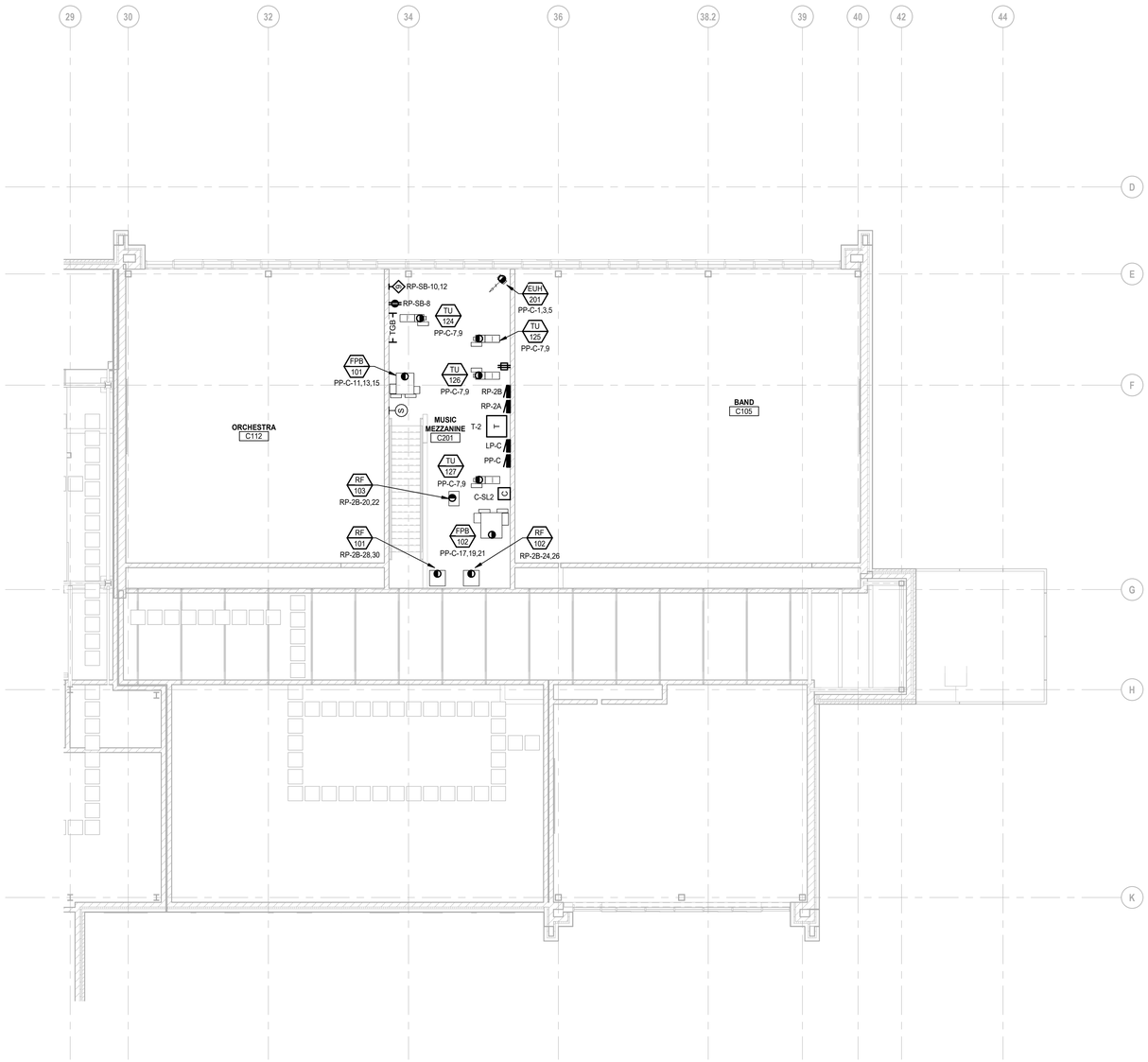

MEZZANINE LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'C'

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

ELECTRICAL GENERAL NOTES:

1 THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

5 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 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.

10 REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.

11 THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.

12 REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

13 CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.

14 PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1 MOUNT RECEPTACLES HORIZONTALLY

2 ELECTRICAL CONTRACTOR SHALL INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF ELECTRICAL BACKBOARD WINCH UP IN CEILING SPACE. ALSO INSTALL 4 POLE, TWIST LOCK, SINGLE RECEPTACLE, PROVIDED BY WINCH MANUFACTURERS, INTO THE JUNCTION BOX.

3 ELECTRICAL CONTRACTOR SHALL INSTALL ALL CONTROLS, PUSHBUTTONS, KEY SWITCHES ETC. (PROVIDED WITH EACH BASKETBALL BACKBOARD), FOR A COMPLETE OPERABLE SYSTEM. KEY SWITCHES GANGED IN PAIRS IN ONE COVER PLATE TO CONTROL THE BACKSTOP SWING AND HEIGHT ADJUSTER.

4 HEAT TRACE, BY OTHERS.

5 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.

6 REFER TO ARCHITECTURAL FLOOR PLANS, DOOR HARDWARE SCHEDULE ON ARCHITECTURAL DRAWINGS, ACCESS CONTROL SYSTEM SPECIFICATION SECTION AND ACCESS CONTROL DOOR DIAGRAM(S) ON E7 SERIES FOR RACEWAY AND BACK BOX REQUIREMENTS FOR DOOR OR BANK OF DOORS INDICATED. PROVIDE ALL RACEWAYS AND BACK BOXES REQUIRED. COORDINATE WITH DOOR HARDWARE AND SECURITY CONTRACTORS.

7 PROVIDE 2-2" AND 1-1" U.O.N. CONDUITS FOR TECHNOLOGY AND AUXILIARY SYSTEM WIRE AS INDICATED. STUB CONDUITS FROM CEILING SPACE. PROVIDE PLASTIC BUSHINGS AT EACH END. PROVIDE REMOVABLE/RESEALABLE FIRE STOP PUTTY IN EACH CONDUIT AND FIRE STOP AROUND EACH CONDUIT. COORDINATE WITH TECHNOLOGY CONTRACTOR FOR EXACT LOCATION OF CONDUIT. PROVIDE MINIMUM OF 1" CONDUIT FOR ALL OTHER AREAS REQUIRING SLEEVES.

8 PROVIDE (1)2" CONDUIT WITH PULL STRING AND BUSHINGS FOR TECHNOLOGY. ROUTE UNDER BUILDING AND TERMINATE AT EXTERIOR OF BUILDING.

9 COORDINATE MOUNTING LOCATION WITH TECHNOLOGY CONTRACTOR.

10 CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND EXISTING FIRE ALARM SYSTEM. ROLL-UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.

11 HAND DRYERS FURNISHED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL TRADES.

12 SMOKE DAMPER DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WORK WITH THE TEMPERATURE CONTROLS CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED AIR HANDLER, DAMPER SHALL ALSO CLOSE UPON NORMAL SHUTDOWN OF AIR HANDLER.

13 CARBON MONOXIDE DETECTOR. COORDINATE QUANTITY WITH FIRE MARSHAL.

14 SCOREBOARD. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH IN.

15 WALL MOUNT TRANSFORMER.

16 ELECTRIC RANGE. PROVIDE WALL MOUNTED GFCI MODULE ABOVE COUNTER.

17 LIGHTING RELAY PANEL. COORDINATE WITH THEATRICAL CONSULATANT.

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

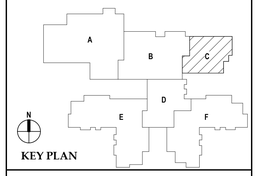
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

MEZZANINE LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'C'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
CHECKED	ZDB
APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

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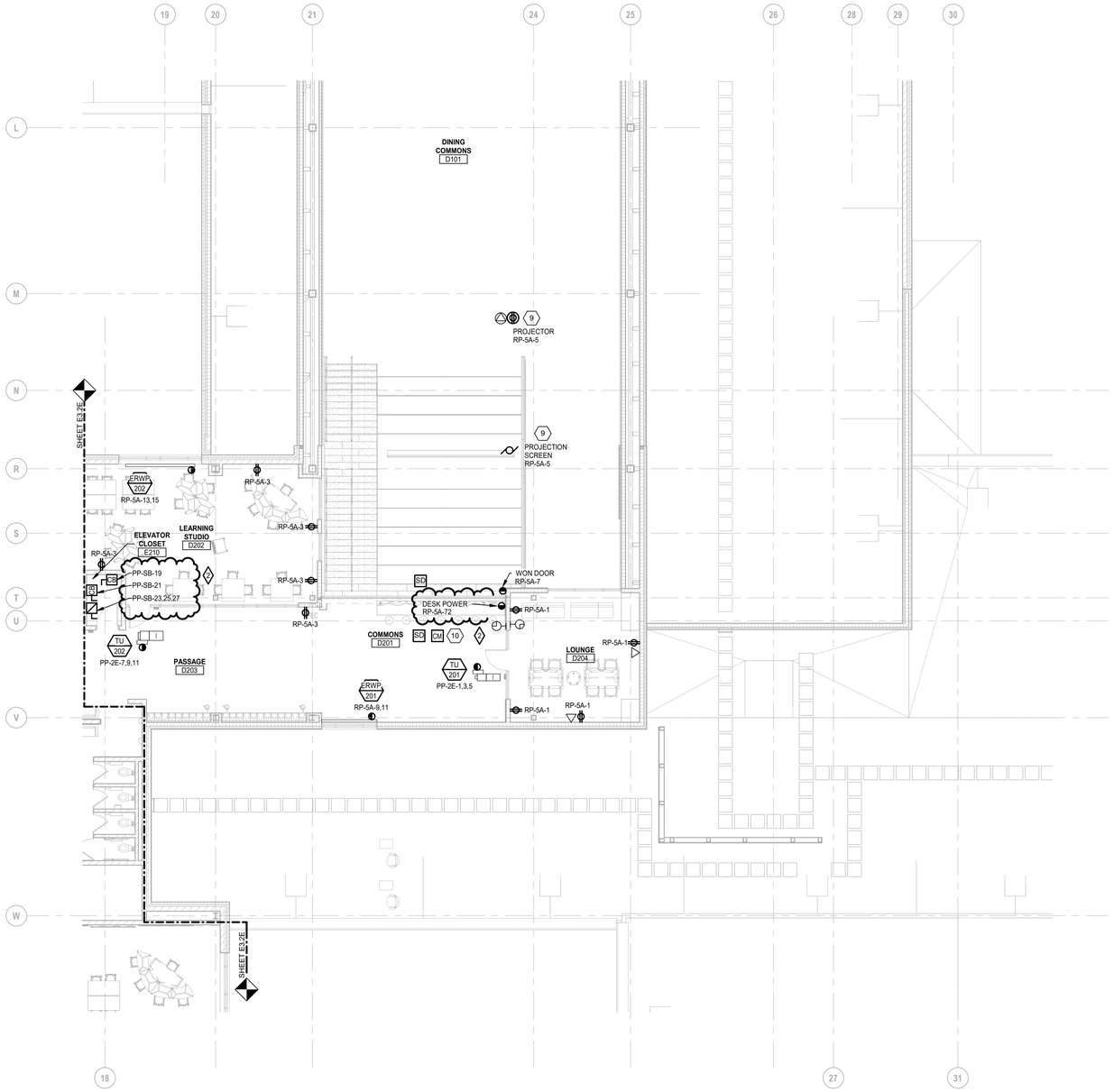

SECOND LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'D'

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

ELECTRICAL GENERAL NOTES:

1 THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

5 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 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.

10 REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.

11 THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.

12 REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

13 CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.

14 PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1 MOUNT RECEPTACLES HORIZONTALLY

2 ELECTRICAL CONTRACTOR SHALL INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF ELECTRICAL BACKBOARD WINCH UP IN CEILING SPACE. ALSO INSTALL 4 POLE, TWIST LOCK, SINGLE RECEPTACLE, PROVIDED BY WINCH MANUFACTURERS, INTO THE JUNCTION BOX.

3 ELECTRICAL CONTRACTOR SHALL INSTALL ALL CONTROLS, PUSHBUTTONS, KEY SWITCHES ETC. (PROVIDED WITH EACH BASKETBALL BACKBOARD), FOR A COMPLETE OPERABLE SYSTEM. KEY SWITCHES GANGED IN PAIRS IN ONE COVER PLATE TO CONTROL THE BACKSTOP SWING AND HEIGHT ADJUSTER.

4 HEAT TRACE, BY OTHERS.

5 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.

6 REFER TO ARCHITECTURAL FLOOR PLANS, DOOR HARDWARE SCHEDULE ON ARCHITECTURAL DRAWINGS, ACCESS CONTROL SYSTEM SPECIFICATION SECTION AND ACCESS CONTROL DOOR DIAGRAM(S) ON E7 SERIES FOR RACEWAY AND BACK BOX REQUIREMENTS FOR DOOR OR BANK OF DOORS INDICATED. PROVIDE ALL RACEWAYS AND BACK BOXES REQUIRED. COORDINATE WITH DOOR HARDWARE AND SECURITY CONTRACTORS.

7 PROVIDE 2-2" AND 1-1" U.O.N. CONDUITS FOR TECHNOLOGY AND AUXILIARY SYSTEM WIRE AS INDICATED. STUB CONDUITS FROM CEILING SPACE. PROVIDE PLASTIC BUSHINGS AT EACH END. PROVIDE REMOVABLE/RESEALABLE FIRE STOP PUTTY IN EACH CONDUIT AND FIRE STOP AROUND EACH CONDUIT. COORDINATE WITH TECHNOLOGY CONTRACTOR FOR EXACT LOCATION OF CONDUIT. PROVIDE MINIMUM OF 1" CONDUIT FOR ALL OTHER AREAS REQUIRING SLEEVES.

8 PROVIDE (1)2" CONDUIT WITH PULL STRING AND BUSHINGS FOR TECHNOLOGY. ROUTE UNDER BUILDING AND TERMINATE AT EXTERIOR OF BUILDING.

9 COORDINATE MOUNTING LOCATION WITH TECHNOLOGY CONTRACTOR.

10 CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND FIRE ALARM SYSTEM. ROLL-UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.

11 HAND DRYERS FURNISHED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL TRADES.

12 SMOKE DAMPER DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WORK WITH THE TEMPERATURE CONTROLS CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED AIR HANDLER, DAMPER SHALL ALSO CLOSE UPON NORMAL SHUTDOWN OF AIR HANDLER.

13 CARBON MONOXIDE DETECTOR. COORDINATE QUANTITY WITH FIRE MARSHAL.

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16 ELECTRIC RANGE. PROVIDE WALL MOUNTED GFCI MODULE ABOVE COUNTER.

17 LIGHTING RELAY PANEL FOR THEATRICAL LIGHTING SYSTEM. REFER TO THEATRICAL LIGHTING EQUIPMENT DRAWINGS.

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PBA Project No.: 2023.0154

PROJECT TITLE

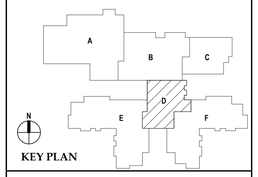
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'D'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
CHECKED	ZDB
APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

E3.2D

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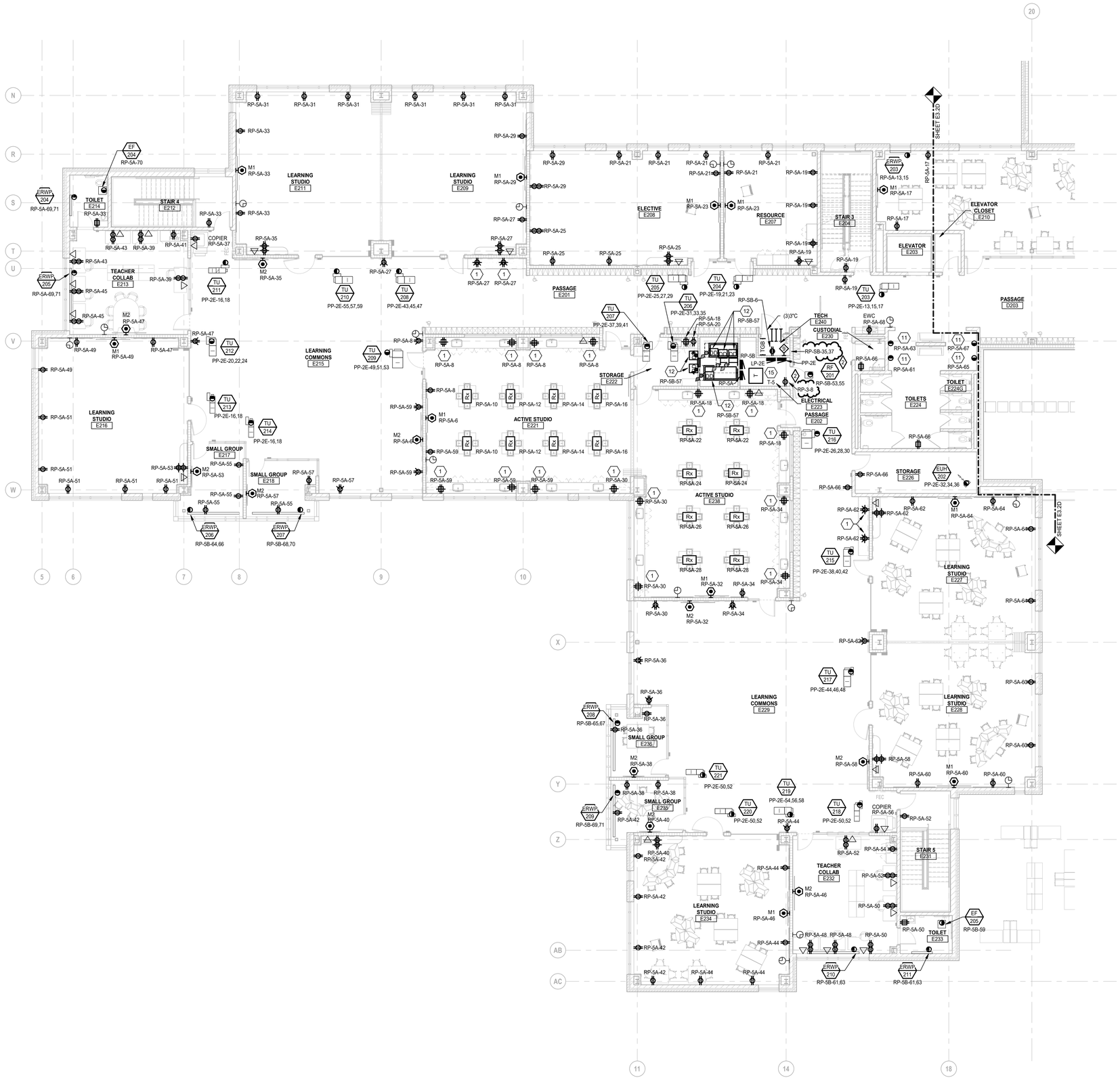
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



SECOND LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'E'

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

ELECTRICAL GENERAL NOTES:

1 THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

5 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

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CONSTRUCTION KEY NOTES:

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www.PeterBassoAssociates.com
PBA Project No.: 2023.0154

PROJECT TITLE

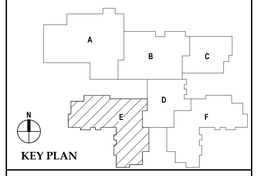
NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

SECOND LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'E'



KEY PLAN

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
CHECKED	ZDB
APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

E3.2E

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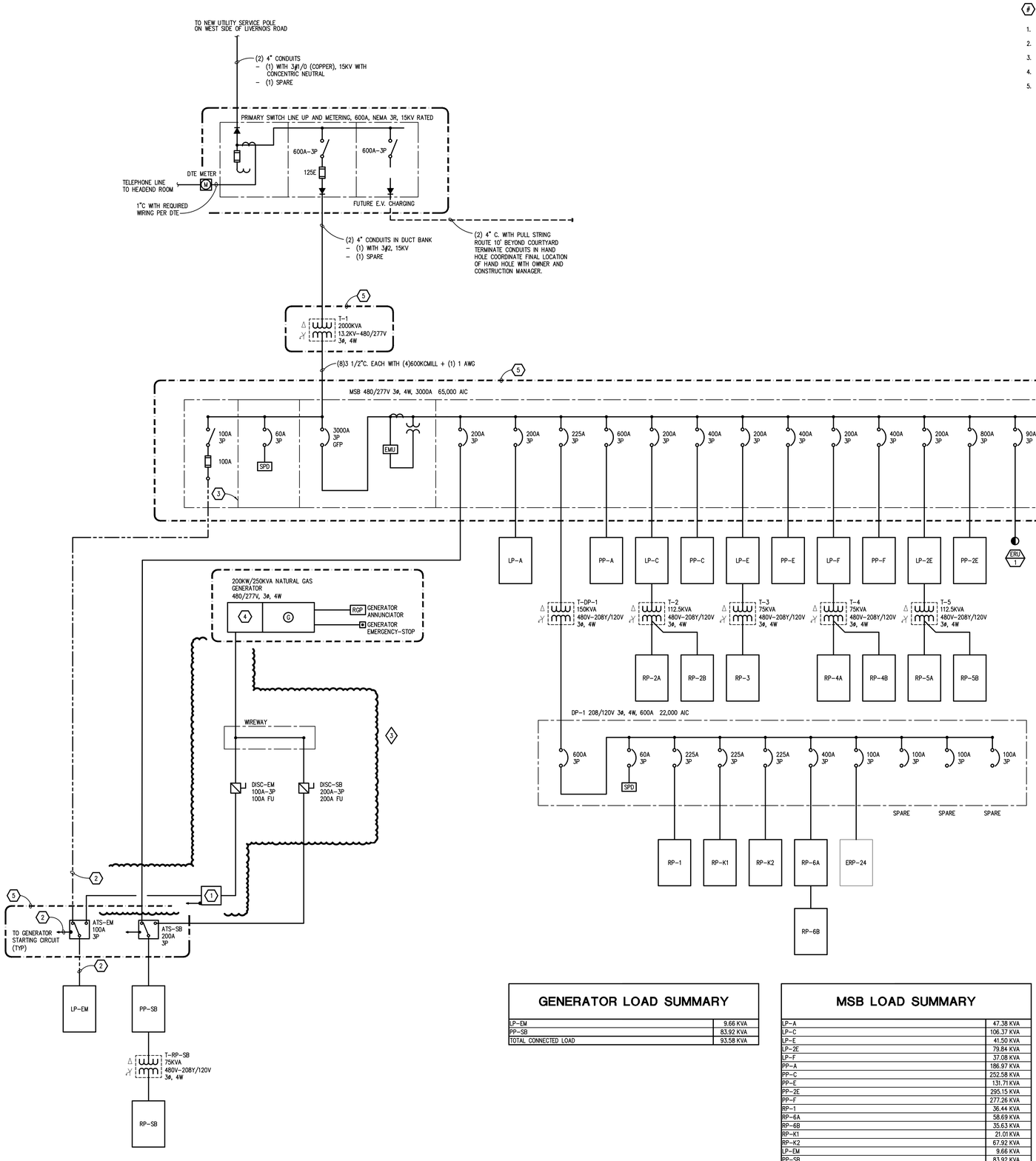

CONSTRUCTION KEY NOTES:

1. PORTABLE GENERATOR DOCKING STATION.
2. LISTED 2 HOUR FIRE-RATED CONDUIT AND CABLING ASSEMBLY PER 700.10(D).
3. SEPARATE VERTICAL SECTIONS PER 700.10(B)(6).
4. PROVIDE GENERATOR PROTECTION RELAYS.
5. PRE-PURCHASED EQUIPMENT COORDINATE WITH OWNER AND CONSTRUCTION MANAGER.

DIAGRAM GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
2. FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE–GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
3. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "TRANSFORMER CIRCUIT SIZING SCHEDULE–GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
4. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH THE MOTOR CIRCUIT SIZING SCHEDULES ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
5. BASIS OF DESIGN IS EATON DISTRIBUTION EQUIPMENT AND ASCO TRANSFER SWITCHES. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT FROM OTHER APPROVED MANUFACTURERS, THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THE LAYOUT AND CLEARANCE REQUIREMENTS IN ALL SPACES CONTAINING ELECTRICAL EQUIPMENT AND PROVIDE EQUIPMENT MEETING THE SPECIFICATIONS AND ACHIEVING CODE REQUIRED CLEARANCES WITHIN THE SPACE PROVIDED.
6. 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.

GENERATOR LOAD SUMMARY

LP–EM	9.66 KVA
PP–SB	83.92 KVA
TOTAL CONNECTED LOAD	93.58 KVA

MSB LOAD SUMMARY

LP–A	47.38 KVA
LP–C	106.37 KVA
LP–E	41.50 KVA
LP–2E	79.84 KVA
LP–F	37.08 KVA
PP–A	186.97 KVA
PP–C	252.58 KVA
PP–E	131.71 KVA
PP–2E	295.15 KVA
PP–F	277.26 KVA
RP–1	36.44 KVA
RP–6A	58.69 KVA
RP–6B	35.63 KVA
RP–K1	21.01 KVA
RP–K2	67.92 KVA
LP–EM	9.66 KVA
PP–SB	83.92 KVA
ERU–1	69.8 KVA
ERU–4	61.5 KVA
ERU–7	42.4 KVA
TOTAL CONNECTED LOAD	1942.8 KVA

SHORT-CIRCUIT CALCULATIONS

FAULT POINT	PANEL/ TRANSFORMER	SOURCE FAULT POINT	SOURCE Isc	CONDUIT TYPE	CONDUCTOR MATERIAL	CONDUCTOR OR BUS SIZE	"C" VALUE	E (V)	L (FT)	XFMR kVA	XFMR %Z	f	M	Isc
1	XFMR T–1							480		2000	5.75			41,838
2	MSB	1	41,838	NM	CU	8 SETS OF 600 KCML	28033	480	50.0			0.034	0.97	40,476
3	LP–EM	2	40,476	M	CU	1 SET OF 3	4774	480	50.0			1.530	0.40	16,001
4	PP–SB	2	40,476	M	CU	1 SET OF 3/0	12844	480	50.0			0.569	0.64	25,805
5	T–RP–SB(PRIMARY)	4	25,805	M	CU	1 SET OF 1	7293	480	10.0			0.128	0.89	22,883
6	T–RP–SB(SECONDARY)	5	22,883					208		75	3.61	9.146	0.10	5,205
7	RP–SB	6	5,205	M	CU	1 SET OF 4/0	15082	208	10.0			0.029	0.97	5,059
8	LP–A	2	40,476	M	CU	1 SET OF 3/0	12844	480	10.0			0.114	0.90	36,343
9	T–DP–1(PRIMARY)	2	40,476	M	CU	1 SET OF 4/0	15082	480	35.0			0.339	0.75	30,230
10	T–DP–1(SECONDARY)	9	30,230					208		150	3.46	5.790	0.15	10,274
11	DP–1	10	10,274	M	CU	2 SETS OF 350 KCML	19704	208	15.0			0.033	0.97	9,950
12	RP–1	11	9,950	M	CU	1 SET OF 4/0	15082	208	10.0			0.055	0.95	9,431
13	RP–K1	11	9,950	M	CU	1 SET OF 4/0	15082	208	70.0			0.385	0.72	7,186
14	RP–K2	11	9,950	M	CU	1 SET OF 4/0	15082	208	70.0			0.385	0.72	7,186
15	PP–A	2	40,476	M	CU	2 SETS OF 350 KCML	19704	480	20.0			0.074	0.93	37,683
16	PP–C	2	40,476	M	CU	1 SET OF 600 KCML	22965	480	320.0			2.035	0.33	13,336
17	T–2(PRIMARY)	16	13,336	M	CU	1 SET OF 2/0	10755	480	10.0			0.045	0.96	12,765
18	T–2(SECONDARY)	17	12,765					208		112.5	4.37	4.117	0.20	5,756
19	RP–2A	18	5,756	M	CU	1 SET OF 600 KCML	22965	208	10.0			0.021	0.98	5,639
20	RP–2B	19	5,639	M	CU	1 SET OF 600 KCML	22965	208	10.0			0.020	0.98	5,526
21	LP–C	2	40,476	M	CU	1 SET OF 3/0	12844	480	320.0			3.639	0.22	8,726
22	LP–E	2	40,476	M	CU	1 SET OF 3/0	12844	480	150.0			1.706	0.37	14,960
23	T–3(PRIMARY)	22	14,960	M	CU	1 SET OF 1	7293	480	10.0			0.074	0.93	13,929
24	T–3(SECONDARY)	23	13,929					208		75	3.61	5.567	0.15	4,894
25	RP–3	24	4,894	M	CU	1 SET OF 4/0	15082	208	10.0			0.027	0.97	4,766
26	PP–E	2	40,476	M	CU	1 SET OF 600 KCML	22965	480	150.0			0.954	0.51	20,715
27	LP–F	2	40,476	M	CU	1 SET OF 3/0	12844	480	280.0			3.184	0.24	9,674
28	T–4(PRIMARY)	27	9,674	M	CU	1 SET OF 1	7293	480	10.0			0.048	0.95	9,232
29	T–4(SECONDARY)	28	9,232					208		75	3.61	3.690	0.21	4,543
30	RP–4	29	4,543	M	CU	1 SET OF 4/0	15082	208	10.0			0.025	0.98	4,431
31	PP–F	2	40,476	M	CU	1 SET OF 600 KCML	22965	480	280.0			1.781	0.36	14,556
32	LP–2E	2	40,476	M	CU	1 SET OF 3/0	12844	480	170.0			1.933	0.34	13,800
33	T–5(PRIMARY)	32	13,800	M	CU	1 SET OF 1	7293	480	10.0			0.068	0.94	12,918
34	T–5(SECONDARY)	33	12,918					208		112.5	4.37	4.167	0.19	5,770
35	RP–5	34	5,770	M	CU	1 SET OF 4/0	15082	208	10.0			0.032	0.97	5,591
36	RP–6	11	9,950	M	CU	1 SET OF 4/0	15082	208	145.0			0.797	0.56	5,538
37	PP–2E	2	40,476	M	CU	2 SETS OF 600 KCML	22965	480	170.0			0.541	0.65	26,273
38	ERU–1	2	40,476	M	CU	1 SET OF 3	4774	480	150.0			4.589	0.18	7,242
39	ERU–4	2	40,476	M	CU	1 SET OF 3	4774	480	160.0			4.895	0.17	6,866
40	ERU–7	2	40,476	M	CU	1 SET OF 6	2425	480	140.0			8.432	0.11	4,291

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

$Isc = Isc \times M$
$M = 1/(1+f)$

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

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

XFMR: $f = \frac{Isc \times Ep \times 1.73 \times \%Z}{100{,}000 \times KVA}$ $Isc = \frac{Ep \times M \times Isc}{Es}$

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

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

ONE LINE DIAGRAM

ISSUE DATES

DATE:	ISSUED FOR:
07-16-2024	ADDENDUM #3
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN DDS
CHECKED ZDB
APPROVED STP

PROJECT NO.

22102

DRAWING NO.

E5.1

G:\2023\2023-0154-00\CAD\2023-0154-E5-DG.dwg, E5.1, 7/16/2024 8:44:24 AM, Zachary D. Bussey, None .0.09448, Peter Basso Associates Inc.

PANELBOARD LP-F

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	A	B	B	C	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					14140	0					20	--	SPARE	--	2
3	Spare; R; NC	T-4		125			15250	0			20	--	SPARE	--	4
5									11730	0	20	--	SPARE	--	6
7	L	LIGHTING		20	1199	0					20	--	SPARE	--	8
9	L	LIGHTING		20			1834	0			20	--	SPARE	--	10
11	L	LIGHTING		20					1111	0	20	--	SPARE	--	12
13	L	LIGHTING		20	1494	0					20	--	SPARE	--	14
15	L	LIGHTING		20			1236	0			20	--	SPARE	--	16
17	L	LIGHTING		20					1067	0	20	--	SPARE	--	18
19	L	LIGHTING		20	1832	0					20	--	SPARE	--	20
21	--	SPACE	--	--			--	--			--	--	SPACE	--	22
23	--	SPACE	--	--					--	--	--	--	SPACE	--	24
25	--	SPACE	--	--	--	--					--	--	SPACE	--	26
27	--	SPACE	--	--			--	--			--	--	SPACE	--	28
29	--	SPACE	--	--					--	--	--	--	SPACE	--	30
					18664		18319		13907						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	3500	100%	3500	100%	3500	
MINIMUM A.I.C.:	22,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	27620	50%	13810	100%	13810	
		LIGHTING LOAD (L):	9770.76	100%	9770.76	125%	12213.45	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	0	125 %	0	100%	0	
PANELBOARD LOCATION		MOTORS, REMAINING	0	100 %	0	100 %	0	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	**37.08**			
				TOTAL...	**44.60**	TOTAL...	**47.54**	

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PANELBOARD LP-A

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	A	B	B	C	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	L	LIGHTING		20	1548	1952					20		LIGHTING	L	2
3	L	LIGHTING		20			1681	944			20		LIGHTING	L	4
5	L	LIGHTING		20					1191	1027	20		EXTERIOR LIGHTING	L	6
7	L	LIGHTING		20	2400	0					20	--	SPARE	--	8
9	L	LIGHTING		20			2400	0			20	--	SPARE	--	10
11	L	LIGHTING		20					1151	0	20	--	SPARE	--	12
13					5265	0					20	--	SPARE	--	14
15	NC	ERU-5		25			5265	0			20	--	SPARE	--	16
17									5265	0	20	--	SPARE	--	18
19					5543	0					20	--	SPARE	--	20
21	NC	ERU-6		25			5543	0			20	--	SPARE	--	22
23									5543	0	20	--	SPARE	--	24
25	L	SITE LIGHTING		20	660	0					20	--	SPARE	--	26
27	--	SPARE	--	20			0	0			20	--	SPARE	--	28
29	--	SPARE	--	20					0	0	20	--	SPARE	--	30
					17368		15833		14177						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	32423.99	100%	32423.99	100%	32423.99	
MINIMUM A.I.C.:	42,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	0	100%	0	100%	0	
		RECEPT DEMAND LOAD (R):	0	50%	0	100%	0	
		LIGHTING LOAD (L):	14953.85	100%	14953.85	125%	18692.31	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	0	125 %	0	100%	0	
PANELBOARD LOCATION		MOTORS, REMAINING	0	100 %	0	100 %	0	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	**47.38**			
				TOTAL...	**56.99**	TOTAL...	**61.48**	

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PANELBOARD LP-EM

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	A	B	B	C	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	L	LIGHTING		20	2238	--					--	--	SPACE	--	2
3	L	LIGHTING		20			2400	--			--	--	SPACE	--	4
5	L	LIGHTING		20					1075	--	--	--	SPACE	--	6
7	L	LIGHTING		20	891	--					--	--	SPACE	--	8
9	L	LIGHTING		20			925	--			--	--	SPACE	--	10
11	L	LIGHTING		20					1106	--	--	--	SPACE	--	12
13	L	LIGHTING		20	1021	--					--	--	SPACE	--	14
15	--	SPACE	--	--			--	--			--	--	SPACE	--	16
17	--	SPACE	--	--					--	--	--	--	SPACE	--	18
19	--	SPACE	--	--	--	--					--	--	SPACE	--	20
21	--	SPACE	--	--			--	--			--	--	SPACE	--	22
23	--	SPACE	--	--					--	--	--	--	SPACE	--	24
25	--	SPACE	--	--	--	--					--	--	SPACE	--	26
27	--	SPACE	--	--			--	--			--	--	SPACE	--	28
29	--	SPACE	--	--					--	--	--	--	SPACE	--	30
					4150		3325		2181						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	PROVIDE AS FUSED PANELBOARD.
BUS AMPACITY:	100A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	0	100%	0	100%	0	
MINIMUM A.I.C.:	22,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	0	100%	0	100%	0	
		RECEPT DEMAND LOAD (R):	0	50%	0	100%	0	
		LIGHTING LOAD (L):	9656.15	100%	9656.15	125%	12070.19	
		ADDITIONAL TRACK LIGHTING...				100%	0	
+ PROVIDE INTEGRAL SPD		MOTORS, HIGHEST LOAD (M):	0	125 %	0	100%	0	
PANELBOARD LOCATION		MOTORS, REMAINING	0	100 %	0	100 %	0	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	**9.66**			
				TOTAL...	**11.61**	TOTAL...	**14.52**	

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PANELBOARD LP-2E

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	A	B	B	C	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					34451	0					20	--	SPARE	--	2
3	Spare; L; R; M; NC	T-5		175			33435	0			20	--	SPARE	--	4
5									32865	0	20	--	SPARE	--	6
7	L	LIGHTING		20	1101	0					20	--	SPARE	--	8
9	L	LIGHTING		20			1531	0			20	--	SPARE	--	10
11	L	LIGHTING		20					2512	0	20	--	SPARE	--	12
13	L	LIGHTING		20	678	0					20	--	SPARE	--	14
15	L	LIGHTING		20			1373	0			20	--	SPARE	--	16
17	--	SPACE	--	--					--	--	--	--	SPACE	--	18
19	--	SPACE	--	--	--	--					--	--	SPACE	--	20
21	--	SPACE	--	--			--	--			--	--	SPACE	--	22
23	--	SPACE	--	--					--	--	--	--	SPACE	--	24
25	--	SPACE	--	--	--	--					--	--	SPACE	--	26
27	--	SPACE	--	--			--	--			--	--	SPACE	--	28
29	--	SPACE	--	--					--	--	--	--	SPACE	--	30
					36230		36339		35377						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	29750	100%	29750	100%	29750	
MINIMUM A.I.C.:	22,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	56960	50%	28480	100%	28480	
		LIGHTING LOAD (L):	7329.46	100%	7329.46	125%	9161.83	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	1500	125 %	1875	100%	1875	
PANELBOARD LOCATION		MOTORS, REMAINING	2406.4	100 %	2406.4	100 %	2406.4	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	**79.84**			
				TOTAL...	**96.03**	TOTAL...	**98.24**	

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PANELBOARD LP-C

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	A	B	B	C	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					29742	1490					20		LIGHTING	L	2
3	Spare; K; R; M; NC	T-2		175			32289	2557			20		LIGHTING	L	4
5									34068	1519	20		LIGHTING	L	6
7	L	LIGHTING		20	1118	804					20		EXTERIOR LIGHTING	L	8
9	L	LIGHTING		20			1065	5960							10
11	L	LIGHTING		20					1633	5960	35		MAU-1	NC	12
13	--	SPARE	--	20	0	5960									14
15	--	SPARE	--	20			0	2196			20		SITE LIGHTING	L	16
17	--	SPARE	--	20					0	1638	20		SITE LIGHTING	L	18
19	--	SPARE	--	20	0	0					20	--	SPARE	--	20
21	--	SPARE	--	20			0	0			20	--	SPARE	--	22
23	--	SPARE	--	20					0	0	20	--	SPARE	--	24
25	--	SPARE	--	20	0	0					20	--	SPARE	--	26
27	--	SPARE	--	20			0	0			20	--	SPARE	--	28
29	--	SPARE	--	20					0	0	20	--	SPARE	--	30
					39113		44067		44819						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	225A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	26670	100%	26670	100%	26670	
MINIMUM A.I.C.:	22,000	KITCHEN LOAD (K):	58790	65.00%	38213.5	100%	38213.5	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	5120	50%	2560	100%	2560	
		LIGHTING LOAD (L):	14019.9	100%	14019.9	125%	17524.88	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	6016.45	125 %	7520.5625	100%	7520.5625	
PANELBOARD LOCATION		MOTORS, REMAINING	7382.45	100 %	7382.45	100 %	7382.45	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	**106.37**			
				TOTAL...	**127.94**	TOTAL...	**132.15**	

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PANELBOARD PP-SB

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	A	B	B	C	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					10897	0					20	--	SPARE	--	2
3	Spare; R; M; NC	T-RP-SB		20			11567	0			20	--	SPARE	--	4
5									10537	0	20	--	SPARE	--	6
7					9422	0					20	--	SPARE	--	8
9	M	CP-3		70			9422	0			20	--	SPARE	--	10
11									9422	0	20	--	SPARE	--	12
13					582	--					--	--	SPACE	--	14
15	M	CP-1		15			582	--			--	--	SPACE	--	16
17									582	--	--	--	SPACE	--	18
19	NC	ELEVATOR LIGHTS		20	250	--					--	--	SPACE	--	20
21	NC	ELEVATOR AUXILIARY		20			500	--			--	--	SPACE	--	22
23									4987	--	--	--	SPACE	--	24
25	NC	ELEVATOR		25	4987	--					--	--	SPACE	--	26
27							4987	--			--	--	SPACE	--	28
29	--	SPACE	--	--					--	--	--	--	SPACE	--	30
					26138		27058		25528						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	29110	100%	29110	100%	29110	
MINIMUM A.I.C.:	42,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	3740	50%	1870	100%	1870	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
+ PROVIDE INTEGRAL SPD		MOTORS, HIGHEST LOAD (M):	28267.07	125 %	35333.8375	100%	35333.8375	
PANELBOARD LOCATION		MOTORS, REMAINING	7605.91	100 %	7605.91	100 %	7605.91	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	**83.92**			
				TOTAL...	**100.94**	TOTAL...	**100.94**	

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PANELBOARD PP-A

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	A	B	B	C	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					582	3242									2
3	M	CP-2		15			582	3242			20		ECUH-101	NC	4
5									582	3242					6
7					9422	1109									8
9	M	CP-4		70			9422	1109			15		EUH-101	NC	10
11									9422	1109					12
13					1108	2993									14
15	NC	EUH-103		15			1108	2993			15		EC-105, EC-106	NC	16
17									1108	2993					18
19					4210	665									20
21	M	BP-1		20			4210	665			15		EC-107, EC7-108	NC	22
23									4210	665					24
25					6845	0									26
27	NC	EC-101		35			6845	0			25		HP-101	NC	28
29									6845	0					30
31					665	2000									32
33	NC	EC-102, EC-103		15			665	2000			15		IMMERSION HEATER	NC	34
35									665	2000					36
37					6346	2105									38
39	NC	EC-104		30			6346	2105			15		SPRAY PUMP	NC	40
41									6346	2105					42
43					2245	5817									44
45	NC	ECUH-102		15			2245	5817			40		COOLING TOWER FAN	NC	46
47									2245	5817					48
49					1690	5817									50
51	NC	EUH-102		15			1690	5817			40		COOLING TOWER FAN	NC	52
53									1690	5817					54
55					1109	2000									56
57	M	EUH-104		15			1109	2000			15		IMMERSION HEATER	NC	58
59									1109	2000					60
61	--	SPARE	--	20	0	0					20	--	SPARE	--	62
63	--	SPARE	--	20			0	0			20	--	SPARE	--	64
65	--	SPARE	--	20					0	0	20	--	SPARE	--	66
67	--	SPARE	--	20	0	0					20	--	SPARE	--	68
69	--	SPARE	--	20			0	0			20	--	SPARE	--	70
71	--	SPARE	--	20					0	0	20	--	SPARE	--	72
					59969		59969		59969						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	600A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	133940.43	100%	133940.43	100%	133940.43	
MINIMUM A.I.C.:	42,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	0	100%	0	100%	0	
		RECEPT DEMAND LOAD (R):	0	50%	0	100%	0	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	28267.07	125 %	35333.8375	100%	35333.8375	
PANELBOARD LOCATION		MOTORS, REMAINING	17700.54	100 %	17700.54	100 %	17700.54	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	**186.97**			
				TOTAL...	**224.90**	TOTAL...	**224.90**	

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PANELBOARD LP-E

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	A	B	B	C	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					12501	0					20	--	SPARE	--	2
3	Spare; L; K; R; M; NC	T-3		20			15152	0			20	--	SPARE	--	4
5									15313	0	20	--	SPARE	--	6
7	L	LIGHTING		20	1321	0					20	--	SPARE	--	8
9	L	LIGHTING		20			1652	0			20	--	SPARE	--	10
11	L	LIGHTING		20					2046	0	20	--	SPARE	--	12
13	L	LIGHTING		20	1000	0					20	--	SPARE	--	14
15	L	LIGHTING		20			1292	0			20	--	SPARE	--	16
17	--	SPARE	--	20					0	0	20	--	SPARE	--	18
19	--	SPARE	--	20	0	0					20	--	SPARE	--	20
21	--	SPARE	--	20			0	0			20	--	SPARE	--	22
23	--	SPARE	--	20					0	0	20	--	SPARE	--	24
25	--	SPARE	--	20	0	0					20	--	SPARE	--	26
27	--	SPARE	--	20			0	0			20	--	SPARE	--	28
29	--	SPARE	--	20					0	0	20	--	SPARE	--	30
					14822		18095		17360						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	5840	100%	5840	100%	5840	
MINIMUM A.I.C.:	22,000	KITCHEN LOAD (K):	7820	80.00%	6256	100%	6256	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	14830	50%	7415	100%	7415	
		LIGHTING LOAD (L):	7401.26	100%	7401.26	125%	9251.58	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	790.4	125 %	988	100%	988	
PANELBOARD LOCATION		MOTORS, REMAINING	3595.2	100 %	3595.2	100 %	3595.2	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	**41.5**			
				TOTAL...	**49.91**	TOTAL...	**52.14**	

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PANELBOARD RP-SB

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	A	B	B	C	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					1700	360					20		IT RACK RECEPTACLE	R	2
3	NC	FREEZER CONDENSER		20			1700	180			20		IT RACK RECEPTACLE	R	4
5									1700	180	20		IT RACK RECEPTACLE	R	6
7	NC	B-1		20	1040	180					20		IT RACK RECEPTACLE	R	8
9							1040	1040			20		IT RACK RECEPTACLE	R	10
11	NC	BATTERY CHARGER		20					250	1040					12
13	NC	GENERATOR BLOCK HEATER		20	250	1040					20		IT RACK RECEPTACLE	R	14
15							1080	1040							16
17	NC	REFRIGERATOR CONDENSER		20					1080	1040	20		IT RACK RECEPTACLE	R	18
19					1080	1040									20
21	M	HEAT TAPE (FREEZER)	GFE	20			2000	180			20		IT RACK RECEPTACLE	R	22
23	NC	FREEZER BLOWER COIL		20					1140	100	20		REFRIGERATOR BLOWER COIL	NC	24
25					1140	100									26
27							887	1200			20		SP-2	M	28
29	M	SP-1		15					887	1040	20		IT RACK RECEPTACLE	R	30
31					887	1040									32
33	R	IT RACK RECEPTACLE		20			180	1040			20		IT RACK RECEPTACLE	R	34
35	R	IT RACK RECEPTACLE		20					1040	1040					36
37					1040	0					20	--	SPARE	--	38
39	--	SPARE	--	20			0	0			20	--	SPARE	--	40
41	--	SPARE	--	20					0	0	20	--	SPARE	--	42
43	--	SPACE	--	--	--	--					--	--	SPACE	--	44
45	--	SPACE	--	--			--	--			--	--	SPACE	--	46
47	--	SPACE	--	--					--	--	--	--	SPACE	--	48
49	--	SPACE	--	--	--	--					--	--	SPACE	--	50
51	--	SPACE	--	--			--	--			--	--	SPACE	--	52
53	--	SPACE	--	--					--	--	--	--	SPACE	--	54
55	--	SPACE	--	--	--	--					--	--	SPACE	--	56
57	--	SPACE	--	--			--	--			--	--	SPACE	--	58
59	--	SPACE	--	--					--	--	--	--	SPACE	--	60
					10897		11567		10537						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	200A MCB	NON-CONTINUOUS LOAD (NC):	13400	100%	13400	100%	13400	
MINIMUM A.I.C.:	10,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	3740	50%	1870	100%	1870	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
+ PROVIDE INTEGRAL SPD		MOTORS, HIGHEST LOAD (M):	2660	125 %	3325	100%	3325	
PANELBOARD LOCATION		MOTORS, REMAINING	3200	100 %	3200	100 %	3200	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	**31.8**			
				TOTAL...	**88.25**	TOTAL...	**88.25**	

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

PANEL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN DDS
CHECKED ZDB
APPROVED STP

PROJECT NO.
22102

DRAWING NO.
E5.2

7/11/2024 2:10:16 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

PANELBOARD RP-2B

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	NC	RANGE HOOD		20	600	600					20		RANGE HOOD	NC	2
3	NC	RANGE HOOD		20			600	600			20		RANGE HOOD	NC	4
5	K	ELECTRIC RANGE	GFCI	50					3625	3625	50	GFCI	ELECTRIC RANGE	K	6
7					3625	3625									8
9	K	ELECTRIC RANGE	GFCI	50			3625	3625			50	GFCI	ELECTRIC RANGE	K	10
11									3625	3625					12
13	NC	RANGE HOOD		20	600	3625					50	GFCI	ELECTRIC RANGE	K	14
15	K	ELECTRIC RANGE	GFCI	50			3625	3625							16
17									3625	600	20		RANGE HOOD	NC	18
19	K	ELECTRIC RANGE	GFCI	50	3625	175					15		RF-103	NC	20
21							3625	175							22
23	NC	RANGE HOOD		20					600	560	15		RF-102	NC	24
25	NC	ERWP-109		15	300	560									26
27							300	560			15		RF-101	NC	28
29	NC	ERWP-108		15					300	560					30
31					300	156					15		EF-107	M	32
33	M	EF-104		15			348	0			20	--	SPARE	--	34
35	M	EF-105		15					264	0	20	--	SPARE	--	36
37	NC	HEAT TRACE		20	750	0					20	--	SPARE	--	38
39	R	SERVICE RECEPTACLE		20			360	0			20	--	SPARE	--	40
41	M	EF-106		15					348	0	20	--	SPARE	--	42
43	--	SPACE	--	--	--	--					--	--	SPACE	--	44
45	--	SPACE	--	--			--	--			--	--	SPACE	--	46
47	--	SPACE	--	--					--	--	--	--	SPACE	--	48
49	--	SPACE	--	--	--	--					--	--	SPACE	--	50
51	--	SPACE	--	--			--	--			--	--	SPACE	--	52
53	--	SPACE	--	--					--	--	--	--	SPACE	--	54
55	--	SPACE	--	--	--	--					--	--	SPACE	--	56
57	--	SPACE	--	--			--	--			--	--	SPACE	--	58
59	--	SPACE	--	--					--	--	--	--	SPACE	--	60
					18541		21068		21357						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...		NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	200A MCB	NON-CONTINUOUS LOAD (NC):	8740	100%	8740	100%	8740	
MINIMUM A.I.C.:	22,000	KITCHEN LOAD (K):	50750	65.00%	32987.5	100%	32987.5	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	360	100%	360	100%	360	
		RECEPT DEMAND LOAD (R):	0	50%	0	100%	0	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
• PROVIDE INTEGRAL SPD		MOTORS, HIGHEST LOAD (M):	348	125 %	435	100%	435	
PANELBOARD LOCATION		MOTORS, REMAINING	768	100 %	768	100 %	768	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	43.29			
				TOTAL...	120.16	TOTAL...	120.16	

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PANELBOARD RP-3

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	L	ELEVATOR PIT LIGHTS		20	90	1080					20		RECEPTACLES	R	2
3	K	ELECTRIC RANGE	GFCI	50			3640	180			20	GFCI	REFRIGERATOR	R	4
5									3640	180	20		RECEPTACLES	R	6
7	NC	RANGE HOOD		20	250	1080					20		RECEPTACLES	R	8
9	K	RECEPTACLES		20			360	900			20		RECEPTACLES	R	10
11	K	REFRIGERATOR	GFCI	20					180	720	20		RECEPTACLES	R	12
13	R	RECEPTACLES		20	540	1080					20		RECEPTACLES	R	14
15	R	RECEPTACLES		20			720	1080			20		RECEPTACLES	R	16
17	R	RECEPTACLES		20					900	900	20		RECEPTACLES	R	18
19	R	RECEPTACLES		20	540	900					20		RECEPTACLES	R	20
21	NC	WON DOOR		20			100	540			20		RECEPTACLES	R	22
23	R	RECEPTACLES		20					900	900	20		RECEPTACLES	R	24
25	NC	SOUND RACK		20	360	1080					20		RECEPTACLES	R	26
27	R	RECEPTACLES		20			540	540			20		RECEPTACLES	R	28
29	NC	ERWP-110		15					700	750	20		COPIER	R	30
31					700	180					20		REFRIGERATOR	R	32
33	NC	ERWP-111		15			700	720			20		RECEPTACLES	R	34
35									700	720	20		RECEPTACLES	R	36
37	NC	ERWP-112		15	700	900					20		RECEPTACLES	R	38
39							700	720			20		RECEPTACLES	R	40
41	R	VENDING MACHINE		20					500	900	20		RECEPTACLES	R	42
43	R	RECEPTACLES		20	180	720					20		RECEPTACLES	R	44
45	NC	DISHWASHER	GFCI	20			250	1080			20		RECEPTACLES	R	46
47	NC	DISPOSAL	GFCI	20					180	1080	20		RECEPTACLES	R	48
49	R	REFRIGERATOR	GFCI	20	180	395					15		EF-116	M	50
51	M	EF-114		15			696	395							52
53	M	EF-115		15					264	264	15		EF-201	M	54
55	M	EF-117		15	395	395					15		EF-202	M	56
57							395	395							58
59	R	RECEPTACLES		20					540	395	15		EF-203	M	60
61	R	SERVICE RECEPTACLES		20	360	395									62
63	NC	HEAT TRACE		20			250	250			20		HEAT TRACE	NC	64
65	--	SPARE	--	20					0	0	20	--	SPARE	--	66
67	--	SPARE	--	20	0	0					20	--	SPARE	--	68
69	--	SPARE	--	20			0	0			20	--	SPARE	--	70
71	--	SPARE	--	20					0	0	20	--	SPARE	--	72
					12501		15152		15313						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...		NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	200A MCB	NON-CONTINUOUS LOAD (NC):	5840	100%	5840	100%	5840	
MINIMUM A.I.C.:	10,000	KITCHEN LOAD (K):	7820	80.00%	6256	100%	6256	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	14830	50%	7415	100%	7415	
		LIGHTING LOAD (L):	90	100%	90	125%	112.5	
		ADDITIONAL TRACK LIGHTING...				100%	0	
• PROVIDE INTEGRAL SPD		MOTORS, HIGHEST LOAD (M):	790.4	125 %	988	100%	988	
PANELBOARD LOCATION		MOTORS, REMAINING	3595.2	100 %	3595.2	100 %	3595.2	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	34.18			
				TOTAL...	94.89	TOTAL...	94.95	

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PANELBOARD PP-2E

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					833	29930									2
3	NC	TU-201		15			833	29930			125	STB	ERU-9	NC	4
5									833	29930					6
7					2167	--					--	--	SPACE	--	8
9	NC	TU-202		15			2167	29930							10
11									2167	29930	125		ERU-8	NC	12
13					833	29930									14
15	NC	TU-203		15			833	1500			15		TU-211,213,214	NC	16
17									833	1500					18
19					1333	2333									20
21	NC	TU-204		15			1333	2333			15		TU-212	NC	22
23									1333	2333					24
25					2333	3667									26
27	NC	TU-205		15			2333	3667			20		TU-216	M	28
29									2333	3667					30
31					3167	1109									32
33	NC	TU-206		20			3167	1109			15		EUH-202	M	34
35									3167	1109					36
37					3167	2167									38
39	NC	TU-207		20			3167	2167			15		TU-215	M	40
41									3167	2167					42
43					2167	2167									44
45	NC	TU-208		15			2167	2167			15		TU-217	M	46
47									2167	2167					48
49					3667	1500									50
51	NC	TU-209		20			3667	1500			15		TU-218,220,221	M	52
53									3667	2333					54
55					2167	2333					15		TU-219	M	56
57	NC	TU-210		15			2167	2333							58
59									2167	0	20	--	SPARE	--	60
61	--	SPARE	--	20	0	0					20	--	SPARE	--	62
63	--	SPARE	--	20			0	0			20	--	SPARE	--	64
65	--	SPARE	--	20					0	0	20	--	SPARE	--	66
67	--	SPARE	--	20	0	0					20	--	SPARE	--	68
69	--	SPARE	--	20			0	0			20	--	SPARE	--	70
71	--	SPARE	--	20					0	0	20	--	SPARE	--	72
					96968		98468		96968						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...		NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	800A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	255079.02	100%	255079.02	100%	255079.02	
MINIMUM A.I.C.:	42,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	0	100%	0	100%	0	
		RECEPT DEMAND LOAD (R):	0	50%	0	100%	0	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	11000	125 %	13750	100%	13750	
PANELBOARD LOCATION		MOTORS, REMAINING	26325.54	100 %	26325.54	100 %	26325.54	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	295.15			
				TOTAL...	355.02	TOTAL...	355.02	

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PANELBOARD PP-C

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					333	3242									2
3	NC	EUH-201		15			333	3242			20		EUH-105	NC	4
5									333	3242					6
7	NC	TU-124,125,126,127		15	2680	4268									8
9							2680	4268			20		ECUH-103	NC	10
11									5293	4268					12
13	NC	FPB-101		25	5293	4268									14
15							5293	4268			20		ECUH-104	NC	16
17									7290	4268					18
19	NC	FPB-102		35	7290	4540									20
21							7290	4540			20		TU-119	NC	22
23									6137	4540					24
25	NC	FPB-103		30	6137	667									26
27							6137	667			15		TU-118	NC	28
29									3333	667					30
31	NC	TU-123		20	3333	2010					15		TU-114,115,117	NC	32
33							3333	2010							34
35									1500	667					36
37	NC	TU-120		15	1500	667					15		TU-116	NC	38
39							1500	667							40
41	NC	TU-103,104,105		15					1500	2680	15		TU-110,111,112,113	NC	42
43					1500	2680									44
45	NC	TU-101,102		15			1000	2680			15		TU-106,107,108,109	NC	46
47									1000	2680					48
49					3293	2493									50
51	NC	HP-102		15			3293	2493			15		TU-122	NC	52
53									3293	2493					54
55					24653	3850									56
57	NC	ERU-2		110			24653	3850			15		TU-121	NC	58
59									24653	3850					60
61	--	SPARE	--	20	0	0					20	--	SPARE	--	62
63	--	SPARE	--	20			0	0			20	--	SPARE	--	64
65	--	SPARE	--	20					0	0	20	--	SPARE	--	66
67	--	SPARE	--	20	0	0					20	--	SPARE	--	68
69	--	SPARE	--	20			0	0			20	--	SPARE	--	70
71	--	SPARE	--	20					0	0	20	--	SPARE	--	72
					84698		84198		83688						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...		NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	400A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	252583.84	100%	252583.84	100%	252583.84	
MINIMUM A.I.C.:	22,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	0	100%	0	100%	0	
		RECEPT DEMAND LOAD (R):	0	50%	0	100%	0	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	0	125 %	0	100%	0	
PANELBOARD LOCATION		MOTORS, REMAINING	0	100 %	0	100 %	0	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	252.58			
				TOTAL...	303.81	TOTAL...	303.81	

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PANELBOARD RP-1

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	NC	SMOKE DAMPER		20	50	720					20		RECEPTACLES	R	2
3	R	RECEPTACLES		20			720	720			20		RECEPTACLES	R	4
5	R	RECEPTACLES		20					720	1080	20		RECEPTACLES	R	6
7	R	RECEPTACLES		20	900	900					20		RECEPTACLES	R	8
9	R	RECEPTACLES		20			1080	180			20	GFCI	RECEPTACLES	R	10
11	R	SOUND RACK		20					360	720	20		RECEPTACLES	R	12
13	R	RECEPTACLES		20	720	180					20	GFCI	RECEPTACLES	R	14
15	R	RECEPTACLES		20			720	720			20		RECEPTACLES	R	16
17	R	RECEPTACLES		20					900	180	20		RECEPTACLES	R	18
19	NC	HAND DRYER		20	750	750					20		HAND DRYER	NC	20
21	NC	HAND DRYER		20			750	750			20		HAND DRYER	NC	22
23	R	RECEPTACLES		20					540	750	20		HAND DRYER	NC	24
25	NC	HAND DRYER		20	750	750					20		HAND DRYER	NC	26
27	NC	HAND DRYER		20			750	1080			20		RECEPTACLES	R	28
29	R	RECEPTACLES		20					720	1080	20		RECEPTACLES	R	30
31	NC	DWH-1		20	500	1053									32
33	M	HWRP-1		15			530	1053			20		MOTORIZED BLEACHERS	M	34
35	NC	DWH-2		20					500	1053					36
37	M	HWRP-2		15	530	83					20		RF-106	M	38
39	NC	B-2		20			1040	83							40
41									1040	150	20		CONDENSATE PUMP	M	42
43	NC	FAN HEATER		20	750	360					20		SERVICE RECEPTACLE	R	44
45	NC	HAND DRYER		20			1200	250			20		HEAT TRACE	NC	46
47									250	250	20		HEAT TRACE	NC	48
49	R	BACKBOARD		20	250	348					15		EF-101	M	50
51							250	395			15		EF-123	M	52
53									250	395					54
55	R	BACKBOARD		20	250	250					20		OVERHEAD DOOR	M	56
57							250	500			20		HEAT TRACE	NC	58
59	NC	WON DOOR		20					250	500	20		GYM DIVIDING CURTAIN	M	60
61	M	PROJECTION SCREEN		20	500	250					20		SWITCHBOARD SPACE HEATER	NC	62
63	R	GYM TECH RECEPTACLE		20			1250	1250			20		DIGITAL SIGN	C	64
65									1250	250	20		ILLUMINATED SIGN	C	66
67	--	SPARE	--	20	0	0					20	--	SPARE	--	68
69	--	SPARE	--	20			0	0			20	--	SPARE	--	70
71	--	SPARE	--	20					0	0	20	--	SPARE	--	72
					11595		15522		13189						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...		NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	1500	100%	1500	125%	1875	
BUS AMPACITY:	225A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	12580	100%	12580	100%	12580	
MINIMUM A.I.C.:	22,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	9300	50%	4650	100%	4650	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	3160	125 %	3950	100%	3950	
PANELBOARD LOCATION		MOTORS, REMAINING	3764.8	100 %	3764.8	100 %	3764.8	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	36.44			
				TOTAL...	101.16	TOTAL...	102.20	

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PANELBOARD PP-E

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					1663	3667									2
3	NC	ECUH-106		15			1663	3667			20		TU-161	M	4
5									1663	3667					6
7					1663	2167									8
9	NC	ECUH-107		15			1663	2167			15		TU-162	M	10
11									1663	2167					12
13					1663	1500					15		TU-163,165,166	M	14
15	NC	ECUH-108		15			1663	1500							16
17									1663	2333					18
19					1667	2333					15		TU164	M	20
21	M	TU-155		15			1667	2333							22
23									1667	2000					24
25					1333	2000					15		TU-167	M	26
27	M	TU-156		15			1333	2000							28
29									1333	1000					30
31					2333	1000					15		TU-168	M	32
33	M	TU-157		15			2333	1000							34
35									2333	3667					36
37					3167	3667					20		TU-169	M	38
39	M	TU-158		20			3167	3667							40
41									3167	2167					42
43					3167	2167					15		TU-170	M	44
45	M	TU-159		20			3167	2167							46
47									3167	2167					48
49					2167	2167					15		TU-171	M	50
51	M	TU-160		15			2167	2167							52
53									2167	1000	15		TU-154,153	M	54
55					2333	1000									56
57	M	TU-173		15			2333	1500			15		TU-172,174,175	M	58
59									2333	1500					60
61	--	SPARE	--	20	0	0					20	--	SPARE	--	62
63	--	SPARE	--	20			0	0			20	--	SPARE	--	64
65	--	SPARE	--	20					0	0	20	--	SPARE	--	66
67	--	SPARE	--	20	0	0					20	--	SPARE	--	68
69	--	SPARE	--	20			0	0			20	--	SPARE	--	70
71	--	SPARE	--	20					0	0	20	--	SPARE	--	72
					42822		43322		42822						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...		NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	400A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	14964.93	100%	14964.93	100%	14964.93	
MINIMUM A.I.C.:	22,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	0	100%	0	100%	0	
		RECEPT DEMAND LOAD (R):	0	50%	0	100%	0	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	11000	125 %	13750	100%	13750	
PANELBOARD LOCATION		MOTORS, REMAINING	103000	100 %	103000	100 %	103000	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	131.71			
				TOTAL...	158.43	TOTAL...	158.43	

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

PANEL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
CHECKED	ZDB
APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

E5.3

7/11/2024 2:19:19 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

PANELBOARD RP-K1

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	RECEPTACLE		20	180	1050					20	GFCI	E39 MICROWAVE	R	2
3	M	E33 FIRE SUPPRESSION SYSTEM		20			1800	1050							4
5	R	SERVICE RECEPTACLE		20					360	863	20	GFCI	E37 HEATED CABINET	R	6
7	R	RECEPTACLE		20	900	863									8
9	R	CO1 CONVENIENCE OUTLET	GFCI	20			180	180			20		C02 CONVENIENCE OUTLET	K	10
11	K	E44 REACH-IN FREEZER	GFCI	20					1340	180	20		E69 HAND SINK	R	12
13	K	E43 REACH-IN REFRIGERATOR	GFCI	20	880	880					20	GFCI	E68 REACH-IN REFRIGERATOR	K	14
15	R	E42 HAND SINK		20			180	1800			20		EXHAUST HOOD CONTROLS	NC	16
17	K	E48 HEATED CABINET	GFCI	20					863	1800	20		ELECTRONIC GAS VALVE	NC	18
19					863	360					20		COOKS TABLE	K	20
21	K	E34 GAS OVEN-STEAMER	GFCI	20			1920	393							22
23	K	E35 GAS OVEN-STEAMER	GFCI	20					1920	393	20		E10 DISPOSER	K	24
25	K	E36 GAS CONVECTION OVEN	GFCI	20	1840	393									26
27	R	CO1 CONVENIENCE OUTLET	GFCI	20			180	0			20	--	SPARE	--	28
29	K	C02 CONVENIENCE OUTLET		20					180	0	20	--	SPARE	--	30
31	R	CO1 CONVENIENCE OUTLET		20	180	0					20	--	SPARE	--	32
33	K	E9 HAND SINK		20			180	0			20	--	SPARE	--	34
35	K	CO1 CONVENIENCE OUTLET		20					180	0	20	--	SPARE	--	36
37	R	E25 REACH-IN REFRIGERATOR	GFCI	20	580	0					20	--	SPARE	--	38
39	K	C02 CONVENIENCE OUTLET		20			180	0			20	--	SPARE	--	40
41	--	SPARE	--	20					0	0	20	--	SPARE	--	42
					8969		8043		8079						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125% 0	
BUS AMPACITY:	225A	ELECTRIC HEAT (E)	0	100%	0	100% 0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	3600	100%	3600	100% 3600	
MINIMUM A.I.C.:	10,000	KITCHEN LOAD (K):	12946	65.00%	8414.9	100% 8414.9	
MOUNTING:	FLUSH	RECEPT BASE LOAD (R):	6746	100%	6746	100% 6746	
		RECEPT DEMAND LOAD (R):	0	50%	0	100% 0	
		LIGHTING LOAD (L):	0	100%	0	125% 0	
		ADDITIONAL TRACK LIGHTING...				100% 0	
		MOTORS, HIGHEST LOAD (M):	1800	125 %	2250	100% 2250	
PANELBOARD LOCATION		MOTORS, REMAINING	0	100 %	0	100 % 0	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	21.01		
				TOTAL...	58.32	TOTAL... 58.32	

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PANELBOARD RP-K2

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	E64 DISPLAY CASE	GFCI	20	1290	1789					20	GFCI	E66.1 BUFFET	K	2
3							1290	1789							4
5	K	E67 REFRIGERATED CASE	GFCI	20					1920	1040	20	GFCI	E66.2 ADJ SNEEZE GUARD	K	6
7	K	E62 SNEEZE GUARD	GFCI	20	720	1040									8
9	R	E59 CASHIERS STAND	GFCI	20			180	2400			20	GFCI	C03 CONVENIENCE OUTLET	R	10
11	K	E56 BUFFET	GFCI	20					720	2400	20		C02 CONVENIENCE OUTLET	K	12
13	R	E57 CASHIERS STAND	GFCI	20	180	180					20		E46 HAND SINK	R	14
15	K	E52.1 BUFFET	GFCI	20			1785	880			20	GFCI	E45 REACH-IN REFRIGERATOR	K	16
17									1785	10593	100	GFCI	BOOSTER HEATER	K	18
19	K	E52.2 ADJ SNEEZE GUARD	GFCI	20	1040	10593									20
21							1040	10593							22
23	R	CONVEINENCE OUTLET	GFCI	20					2400	6600					24
25	K	E54 HEATED DISPLAY CASE	GFCI	20	1290	6600					100	GFCI	E14 WARE WASHER	M	26
27							1290	6600							28
29	K	E49 REFRIGERATED CASE	GFCI	20					1920	0	20	--	SPARE	--	30
31	--	SPARE	--	20	0	0					20	--	SPARE	--	32
33	--	SPARE	--	20			0	0			20	--	SPARE	--	34
35	--	SPARE	--	20					0	0	20	--	SPARE	--	36
37	--	SPARE	--	20	0	0					20	--	SPARE	--	38
39	--	SPARE	--	20			0	0			20	--	SPARE	--	40
41	--	SPARE	--	20					0	0	20	--	SPARE	--	42
					24721		27846		29378						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125% 0	
BUS AMPACITY:		ELECTRIC HEAT (E)	0	100%	0	100% 0	
MAIN TYPE:		NON-CONTINUOUS LOAD (NC):	0	100%	0	100% 0	
MINIMUM A.I.C.:		KITCHEN LOAD (K):	54227	65.00%	35247.55	100% 35247.55	
MOUNTING:	FLUSH	RECEPT BASE LOAD (R):	7919	100%	7919	100% 7919	
		RECEPT DEMAND LOAD (R):	0	50%	0	100% 0	
		LIGHTING LOAD (L):	0	100%	0	125% 0	
		ADDITIONAL TRACK LIGHTING...				100% 0	
		MOTORS, HIGHEST LOAD (M):	19800	125 %	24750	100% 24750	
PANELBOARD LOCATION		MOTORS, REMAINING	0	100 %	0	100 % 0	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	67.92		
				TOTAL...	188.52	TOTAL... 188.52	

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PANELBOARD RP-5A

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	RECEPTACLES		20	720	45					20		LIGHTING	L	2
3	R	RECEPTACLES		20			900	90			20		LIGHTING	L	4
5	M	PROJECTION SCREEN		20					430	900	20		RECEPTACLES	R	6
7	NC	WON DOOR		20	250	1080					20		RECEPTACLES	R	8
9	NC	ERWP-201		15			600	360			20		CORD REELS	R	10
11									600	360	20		CORD REELS	R	12
13	NC	ERWP-202,203		15	1050	360					20		CORD REELS	R	14
15							1050	360			20		CORD REELS	R	16
17	R	RECEPTACLES		20					360	720	20		RECEPTACLES	R	18
19	R	RECEPTACLES		20	1080	180					20	GFCI	REFRIGERATOR	R	20
21	R	RECEPTACLES		20			1080	360			20		CORD REELS	R	22
23	R	RECEPTACLES		20					720	360	20		CORD REELS	R	24
25	R	RECEPTACLES		20	1080	360					20		CORD REELS	R	26
27	R	RECEPTACLES		20			1080	360			20		CORD REELS	R	28
29	R	RECEPTACLES		20					1080	720	20		RECEPTACLES	R	30
31	R	RECEPTACLES		20	1080	900					20		RECEPTACLES	R	32
33	R	RECEPTACLES		20			1080	720			20		RECEPTACLES	R	34
35	R	RECEPTACLES		20					900	720	20		RECEPTACLES	R	36
37	R	COPIER		20	180	900					20		RECEPTACLES	R	38
39	R	RECEPTACLES		20			720	900			20		RECEPTACLES	R	40
41	R	REFRIGERATOR		20					180	900	20		RECEPTACLES	R	42
43	R	RECEPTACLES		20	720	900					20		RECEPTACLES	R	44
45	R	RECEPTACLES		20			720	900			20		RECEPTACLES	R	46
47	R	RECEPTACLES		20					900	720	20		RECEPTACLES	R	48
49	R	RECEPTACLES		20	720	900					20		RECEPTACLES	R	50
51	R	RECEPTACLES		20			900	900			20		RECEPTACLES	R	52
53	R	RECEPTACLES		20					900	180	20		REFRIGERATOR	R	54
55	R	RECEPTACLES		20	720	180					20		COPIER	R	56
57	R	RECEPTACLES		20			900	360			20		RECEPTACLES	R	58
59	R	RECEPTACLES		20					1080	1080	20		RECEPTACLES	R	60
61	NC	HAND DRYER		20	750	1080					20		RECEPTACLES	R	62
63	NC	HAND DRYER		20			750	900			20		RECEPTACLES	R	64
65	NC	HAND DRYER		20					750	720	20		RECEPTACLES	R	66
67	NC	HAND DRYER		20	750	180					20	GFCI	EWC	R	68
69	NC	ERWP-204,205		15			1050	36			15		EF-204	M	70
71									1050	1080	20		RECEPTACLES	R	72
73	--	SPARE	--	20	0	0					20	--	SPARE	--	74
75	--	SPARE	--	20			0	0			20	--	SPARE	--	76
77	--	SPARE	--	20					0	0	20	--	SPARE	--	78
79	--	SPARE	--	20	0	0					20	--	SPARE	--	80
81	--	SPARE	--	20			0	0			20	--	SPARE	--	82
83	--	SPARE	--	20					0	0	20	--	SPARE	--	84
					16165		17076		17410						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125% 0	
BUS AMPACITY:		ELECTRIC HEAT (E)	0	100%	0	100% 0	
MAIN TYPE:		NON-CONTINUOUS LOAD (NC):	8650	100%	8650	100% 8650	
MINIMUM A.I.C.:		KITCHEN LOAD (K):	0		0	100% 0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100% 10000	
		RECEPT DEMAND LOAD (R):	31400	50%	15700	100% 15700	
		LIGHTING LOAD (L):	135	100%	135	125% 168.75	
		ADDITIONAL TRACK LIGHTING...				100% 0	
+ PROVIDE INTEGRAL SPD		MOTORS, HIGHEST LOAD (M):	250	125 %	312.5	100% 312.5	
PANELBOARD LOCATION		MOTORS, REMAINING	216	100 %	216	100 % 216	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	35.01		
				TOTAL...	97.19	TOTAL... 97.28	

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PANELBOARD RP-4A

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	RECEPTACLES		20	720	1080					20		RECEPTACLES	R	2
3	R	RECEPTACLES		20			1080	1080			20		RECEPTACLES	R	4
5	R	RECEPTACLES		20					720	1080	20		RECEPTACLES	R	6
7	R	RECEPTACLES		20	1080	720					20		RECEPTACLES	R	8
9	R	RECEPTACLES		20			1080	1260			20		RECEPTACLES	R	10
11	R	RECEPTACLES		20					540	360	20		CORD REELS	R	12
13	R	RECEPTACLES		20	1080	360					20		CORD REELS	R	14
15	NC	ERWP-113		15			750	360			20		CORD REELS	R	16
17									750	360	20		CORD REELS	R	18
19	NC	ERWP-114,115		15	1000	540					20		RECEPTACLES	R	20
21							1000	180			20	GFCI	REFRIGERATOR	R	22
23	R	RECEPTACLES		20					720	360	20		CORD REELS	R	24
25	R	RECEPTACLES		20	720	360					20		CORD REELS	R	26
27	R	RECEPTACLES		20			720	360			20		CORD REELS	R	28
29	R	RECPTACLES		20					900	360	20		CORD REELS	R	30
31	R	RECEPTACLES		20	720	900					20		RECEPTACLES	R	32
33	R	RECEPTACLES		20			900	720			20		RECEPTACLES	R	34
35	R	RECEPTACLES		20					720	720	20		RECEPTACLES	R	36
37	R	RECEPTACLES		20	900	720					20		RECEPTACLES	R	38
39	R	RECEPTACLES		20			1080	1080			20		RECEPTACLES	R	40
41	R	COPIER		20					180	900	20		RECEPTACLES	R	42
43	R	REFRIGERATOR		20	180	720					20		RECEPTACLES	R	44
45	R	RECEPTACLES		20			720	720			20		RECEPTACLES	R	46
47	R	RECEPTACLES		20					720	720	20		RECEPTACLES	R	48
49	R	RECEPTACLES		20	720	720					20		RECEPTACLES	R	50
51	R	RECEPTACLES		20			1080	0			20	--	SPARE	--	52
53	R	RECEPTACLES		20					900	0	20	--	SPARE	--	54
55	R	RECEPTACLES		20	900	0					20	--	SPARE	--	56
57	R	RECEPTACLES		20			1080	0			20	--	SPARE	--	58
59	R	RECEPTACLES		20					720	0	20	--	SPARE	--	60
					14140		15250		11730						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125% 0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100% 0	
MAIN TYPE:	200A MCB	NON-CONTINUOUS LOAD (NC):	3500	100%	3500	100% 3500	
MINIMUM A.I.C.:	10,000	KITCHEN LOAD (K):	0		0	100% 0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100% 10000	
		RECEPT DEMAND LOAD (R):	27620	50%	13810	100% 13810	
		LIGHTING LOAD (L):	0	100%	0	125% 0	
		ADDITIONAL TRACK LIGHTING...				100% 0	
+ PROVIDE INTEGRAL SPD		MOTORS, HIGHEST LOAD (M):	0	125 %	0	100% 0	
PANELBOARD LOCATION		MOTORS, REMAINING	0	100 %	0	100 % 0	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	27.31		
				TOTAL...	75.80	TOTAL... 75.80	

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PANELBOARD RP-2A

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	NC	SMOKE DAMPER		20	50	360					20		SOUND RACK	R	2
3	R	SOUND RACK		20			360	1080			20		RECEPTACLES	R	4
5	R	RECEPTACLES		20					900	720	20		RECEPTACLES	R	6
7	R	RECEPTACLES		20	720	720					20		PROJECTOR	R	8
9	R	PROJECTOR		20			720	540			20		RECEPTACLES	R	10
11	R	RECEPTACLES		20					1080	720	20		RECEPTACLES	R	12
13	R	EWC	GFCI	20	180	1080					20		RECEPTACLES	R	14
15	K	REFRIGERATOR	GFCI	20			180	540			20		RECEPTACLES	R	16
17	K	REFRIGERATOR	GFCI	20					180	360	20		RECEPTACLES	R	18
19	R	RECEPTACLES		20	900	720					20		RECEPTACLES	R	20
21	R	CORD REELS		20			1080	250			20		MOTORIZED SHADES	M	22
23	R	CORD REELS		20					1080	1200	20	GFCI	MICROWAVE	K	24
25	K	RECEPTACLES		20	360	540					20		RECEPTACLES	K; R	26
27	K	RECEPTACLES		20			360	360			20		RECEPTACLES	K; R	28
29	K	MICROWAVE	GFCI	20					1200	180	20	GFCI	MICROWAVE	R	30
31	K	RECEPTACLES		20	360	2005					20		EF-108	M	32
33	K	MICROWAVE	GFCI	20			1200	2005							34
35	K	RECEPTACLES		20					540	2005					36
37	K	MICROWAVE	GFCI	20	1200	2005									38
39	K	RECEPTACLES		20			540	2005			20		EF-124	M	40
41	K	RECEPTACLES		20					540	2005					42
43	--	SPARE	--	20	0	0					20	--	SPARE	--	44
45	--	SPARE	--	20			0	0			20	--	SPARE	--	46
47	--	SPARE	--	20					0	0	20	--	SPARE	--	48
49	--	SPARE	--	20	0	0					20	--	SPARE	--	50
51	--	SPARE	--	20			0	0			20	--	SPARE	--	52
53	--	SPARE	--	20					0	0	20	--	SPARE	--	54
55	--	SPARE	--	20	0	0					20	--	SPARE	--	56
57	--	SPARE	--	20			0	0			20	--	SPARE	--	58
59	--	SPARE	--	20					0	0	20	--	SPARE	--	60
					11201		11221		12711						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125% 0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100% 0	
MAIN TYPE:	200A MCB	NON-CONTINUOUS LOAD (NC):	50	100%	50	100% 50	
MINIMUM A.I.C.:	10,000	KITCHEN LOAD (K):	8040	65.00%	5226	100% 5226	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100% 10000	
		RECEPT DEMAND LOAD (R):	4760	50%	2380	100% 2380	
		LIGHTING LOAD (L):	0	100%	0	125% 0	
		ADDITIONAL TRACK LIGHTING...				100% 0	
+ PROVIDE INTEGRAL SPD		MOTORS, HIGHEST LOAD (M):	6016.45	125 %	7520.5625	100% 7520.5625	
PANELBOARD LOCATION		MOTORS, REMAINING	6266.45	100 %	6266.45	100 % 6266.45	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	31.44		
				TOTAL...	87.28	TOTAL... 87.28	

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PANELBOARD PP-F

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1					4543	2493									2
3	NC	TU-136		20			4543	2493			15		TU-145	NC	4
5									4543	2493					6
7					4320	2963									8
9	NC	TU-137		20			4320	2963			15		TU-146	NC	10
11									4320	2963					12
13					2963	4983									14
15	NC	TU-138		15			2963	4983			20		TU-147	NC	16
17									2963	4983					18
19					4983	2963									20
21	NC	TU-139		20			4983	2963			15		TU-148	NC	22
23									4983	2963					24
25					2963	2010					15		TU-149,151,152	NC	26
27	NC	TU-140		15			2963	2010							28
29									2963	3183					30
31					3183	3183					15		TU-150	NC	32
33	NC	TU-142		15			3183	3183							34
35									3183	29916					36
37	NC	TU-141,143,144		15	2010	29916					125		ERU-8	NC	38
39							2010	29916							40
41									3297	2267					42
43	NC	TU--128		15	3297	2267					15		TU-133	NC	44
45							3297	2267							46
47									2010	1827					48
49	NC	TU-129,130,131		15	2010	1827					15		TU-134	NC	50
51							3627	1827							52
53	NC	TU-132		15					3627	1827					54
55					3627	1827					15		TU-135	NC	56
57							6097	1827							58
59	NC	ERU-3		30					6097	0	20	--	SPARE	--	60
61					6097	0					20	--	SPARE	--	62
63	--	SPARE	--	20			0	0			20	--	SPARE	--	64
65	--	SPARE	--	20					0	0	20	--	SPARE	--	66
67	--	SPARE	--	20	0	0					20	--	SPARE	--	68
69	--	SPARE	--	20			0	0			20	--	SPARE	--	70
71	--	SPARE	--	20					0	0	20	--	SPARE	--	72
					94429		92419		90409						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	480Y/277V	CONTINUOUS LOAD (C):	0	100%	0	125% 0	
BUS AMPACITY:	400A	ELECTRIC HEAT (E)	0	100%	0	100% 0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	277258.46	100%	277258.46	100% 277258.46	
MINIMUM A.I.C.:	22,000	KITCHEN LOAD (K):	0		0	100% 0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	0	100%	0	100% 0	
		RECEPT DEMAND LOAD (R):	0	50%	0	100% 0	
		LIGHTING LOAD (L):	0	100%	0	125% 0	
		ADDITIONAL TRACK LIGHTING...				100% 0	
		MOTORS, HIGHEST LOAD (M):	0	125 %	0	100% 0	
PANELBOARD LOCATION		MOTORS, REMAINING	0	100 %	0	100 % 0	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	277.26		
				TOTAL...	333.49	TOTAL... 333.49	

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

PANEL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN DDS
CHECKED ZDB
APPROVED STP

PROJECT NO.
22102

DRAWING NO.
E5.4

7/11/2024 2:10:21 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

PANELBOARD RP-6B

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	RECEPTACLES		20	720	1500					30		DRYER	R	2
3	R	RECEPTACLES		20			900	1500							4
5	R	CORD REELS		20					720	1200	20		WASHER	R	6
7	R	CORD REELS		20	720	1050					15		ERWP-101,102,103	NC	8
9	R	CORD REELS		20			720	1050							10
11	R	CORD REELS		20					360	600	15		ERWP-104,105	NC	12
13	R	RECEPTACLES		20	900	600									14
15	R	RECEPTACLES		20			720	750			15		ERWP-106,107	NC	16
17	R	RECEPTACLES		20					900	750					18
19	R	RECEPTACLES		20	1380	36					15		EF-103	M	20
21	R	RECEPTACLES		20			360	36			15		EF-102	M	22
23	R	DUST COLLECTOR		20					1200	250	20		CONDENSATE PUMP	NC	24
25	R	CHOP SAW		20	1200	720					20		SERVICE RECEPTACLE	R	26
27	R	TABLE SAW		20			1200	250			20		HEAT TRACE	NC	28
29	R	DRILL PRESS		20					1200	250	20		HEAT TRACE	NC	30
31	R	BAND SAW		20	1200	250					20		HEAT TRACE	NC	32
33	R	RECEPTACLES		20			540	520			15		EF-120	M	34
35	R	RECEPTACLES		20					540	520					36
37					2567	520					15		EF-121	M	38
39	NC	MAU-2 CONDENSER		20			2567	520							40
41									2567	700	15		EF-122	M	42
43					577	360					20		RECEPTACLES	R	44
45	NC	MAU-2 FAN		15			577	0			20	--	SPARE	--	46
47									577	0	20	--	SPARE	--	48
49	NC	MAU-2 CONTROLS		15	240	0					20	--	SPARE	--	50
51	--	SPARE	--	20			0	0			20	--	SPARE	--	52
53	--	SPARE	--	20					0	0	20	--	SPARE	--	54
55	--	SPARE	--	20	0	0					20	--	SPARE	--	56
57	--	SPARE	--	20			0	0			20	--	SPARE	--	58
59	--	SPARE	--	20					0	0	20	--	SPARE	--	60
					14539		12209		12333						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	225A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	15470	100%	15470	100%	15470	
MINIMUM A.I.C.:		KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	10760	50%	5380	100%	5380	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	1040	125 %	1300	100%	1300	
PANELBOARD LOCATION		MOTORS, REMAINING	1812	100 %	1812	100 %	1812	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	33.96			
				TOTAL...	94.27	TOTAL...	94.27	

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PANELBOARD RP-4B

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	EWC	GFCI	20	180	750					15		ERWP-122	NC	2
3	NC	HAND DRYER		20			750	750							4
5	NC	HAND DRYER		20					750	300	15		ERWP-123	NC	6
7	NC	HAND DRYER		20	750	300									8
9	NC	HAND DRYER		20			750	36			15		EF-113	M	10
11	R	RECEPTACLES		20					540	83	15		RF-104	M	12
13	R	RECEPTACLES		20	1080	83									14
15	R	RECEPTACLES		20			900	250			20		HEAT TRACE	NC	16
17	R	RECEPTACLES		20					720	360	20		SERVICE RECEPTACLE	R	18
19	R	RECEPTACLES		20	900	250					20		HEAT TRACE	NC	20
21	R	RECEPTACLES		20			720	264			15		EF-109	M	22
23	R	RECEPTACLES		20					720	395	15		EF-110	M	24
25	R	COPIER		20	180	395									26
27	R	REFRIGERATOR		20			180	395			15		EF-111	M	28
29	R	RECEPTACLES		20					720	395					30
31	R	RECEPTACLES		20	720	720					20		RECEPTACLE	R	32
33	NC	ERWP-116,117		15			1050	1080			20		RECEPTACLE	R	34
35									1050	900	20		RECPETACLE	R	36
37	M	EF-112		15	36	1080					20		RECEPTACLE	R	38
39	NC	ERWP-118		15			750	1000			20		HEAT TRACE	NC	40
41									750	0	20	--	SPARE	--	42
43	NC	ERWP-119		15	750	0					20	--	SPARE	--	44
45							750	0			20	--	SPARE	--	46
47	NC	ERWP-120		15					750	0	20	--	SPARE	--	48
49					750	0					20	--	SPARE	--	50
51	NC	ERWP-=121		15			750	0			20	--	SPARE	--	52
53									750	0	20	--	SPARE	--	54
55	--	SPARE	--	20	0	0					20	--	SPARE	--	56
57	--	SPARE	--	20			0	0			20	--	SPARE	--	58
59	--	SPARE	--	20					0	0	20	--	SPARE	--	60
					8924		10375		9184						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	200A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	200A MCB	NON-CONTINUOUS LOAD (NC):	14700	100%	14700	100%	14700	
MINIMUM A.I.C.:	10,000	KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	1700	50%	850	100%	850	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
+ PROVIDE INTEGRAL SPD		MOTORS, HIGHEST LOAD (M):	790.4	125 %	988	100%	988	
PANELBOARD LOCATION		MOTORS, REMAINING	1292.8	100 %	1292.8	100 %	1292.8	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	27.83			
				TOTAL...	77.25	TOTAL...	77.25	

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PANELBOARD RP-5B

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	RECEPTACLES		20	1080	1080					20		RECPETACLES	R	2
3	R	RECEPTACLES		20			900	540			20		RECEPTACLES	R	4
5	R	RECEPTACLES		20					720	1080	20		RECEPTACLES	R	6
7	NC	HAND DRYER		20	750	720					20		CORD REELS	R	8
9	NC	HAND DRYER		20			750	720			20		CORD REELS	R	10
11	NC	HAND DRYER		20					750	720	20		CORD REELS	R	12
13	NC	HAND DRYER		20	750	720					20		CORD REELS	R	14
15	R	RECEPTACLES		20			180	720			20		RECEPTACLES	R	16
17	NC	ERWP-124,125		15					900	180	20	GFCI	REFRIGERATOR	R	18
19					900	180					20		SERVICE RECEPTACLE	R	20
21	M	EF-118		15			36	720			20		RECEPTACLES	R	22
23	NC	ERWP-126.127		15					1050	900	20		RECEPTACLES	R	24
25					1050	720					20		CORD REELS	R	26
27	NC	ERWP-128		15			750	720			20		CORD REELS	R	28
29									750	720	20		RECEPTACLES	R	30
31	NC	ERWP-129		15	750	720					20		RECEPTACLES	R	32
33							750	720			20		RECEPTACLES	R	34
35	NC	ERWP-130		15					750	900	20		RECEPTACLES	R	36
37					750	720					20		RECEPTACLES	R	38
39	NC	ERWP-131		15			750	900			20		RECEPTACLES	R	40
41									750	900	20		RECEPTACLES	R	42
43	NC	ERWP-132,133		15	1050	900					20		RECEPTACLES	R	44
45							1050	1080			20		RECEPTACLE	R	46
47	M	EF-119		15					36	900	20		RECEPTACLES	R	48
49	M	RF-105		20	83	900					20		RECEPTACLES	R	50
51							83	720			20		RECEPTACLES	R	52
53	M	RF-201		15					83	180	20		REFRIGERATOR	R	54
55					83	1080					20		RECEPTACLES	R	56
57	NC	SMOKE DAMPER		20			250	720			20		RECEPTACLES	R	58
59	M	EF-205		20					36	900	20		RECEPTACLES	R	60
61	NC	ERWP-210,211		20	1050	750					20		COPIER	NC	62
63							1050	750			20		ERWP-206	M	64
65	NC	ERWP-208		20					750	750					66
67					750	750					20		ERWP-207	M	68
69	NC	ERWP-209		20			750	750							70
71									750	0	20	--	SPARE	--	72
73	--	SPARE	--	20	0	0					20	--	SPARE	--	74
75	--	SPARE	--	20			0	0			20	--	SPARE	--	76
77	--	SPARE	--	20					0	0	20	--	SPARE	--	78
79	--	SPARE	--	20	0	0					20	--	SPARE	--	80
81	--	SPARE	--	20			0	0			20	--	SPARE	--	82
83	--	SPARE	--	20					0	0	20	--	SPARE	--	84
					18286		16359		15455						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	0	100%	0	125%	0	
BUS AMPACITY:	225A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	225A MCB	NON-CONTINUOUS LOAD (NC):	21100	100%	21100	100%	21100	
MINIMUM A.I.C.:		KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	15560	50%	7780	100%	7780	
		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
+ PROVIDE INTEGRAL SPD		MOTORS, HIGHEST LOAD (M):	1500	125 %	1875	100%	1875	
PANELBOARD LOCATION		MOTORS, REMAINING	1940.4	100 %	1940.4	100 %	1940.4	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	42.7			
				TOTAL...	118.51	TOTAL...	118.51	

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PANELBOARD RP-6A

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	RECEPTACLES		20	720	500					20	LOD	FIRE ALARM CONTROL PANEL	NC	2
3	R	RECEPTACLES		20			900	500			20		FIRE ALARM SMOKE DAMPERS	NC	4
5	R	RECEPTACLES		20					900	900	20		RECPTACLES	R	6
7	R	RECEPTACLES		20	1080	900					20		RECEPTACLES	R	8
9	R	RECEPTACLES		20			720	180			20		REFRIGERATOR	R	10
11	R	RECEPTACLES		20					1080	180	20		COPIER	R	12
13	R	RECEPTACLES		20	900	720					20		CORD REELS	R	14
15	R	RECEPTACLES		20			720	720			20		CORD REELS	R	16
17	R	RECEPTACLES		20					360	720	20		CORD REELS	R	18
19	R	RECEPTACLES		20	360	720					20		CORD REELS	R	20
21	R	RECEPTACLES		20			720	360			20		RECEPTACLES	R	22
23	R	RECPETACLES		20					360	360	20		RECEPTACLES	R	24
25	R	RECEPTACLES		20	720	180					20		KILN EXHAUST	R	26
27	R	COPIER		20			180	2080			30		KILN	C	28
29	R	RECEPTACLES		20					360	2080					30
31	R	RECEPTACLES		20	360	720					20		RECEPTACLES	R	32
33	R	RECEPTACLES		20			180	1200			20		HAND DRYER	NC	34
35	R	REFRIGERATOR	GFCI	20					180	1200	20		HAND DRYER	NC	36
37	NC	DISHWASHER	GFCI	20	250	1200					20		HAND DRYER	NC	38
39	NC	DISPOSAL	GFCI	20			180	1200			20		HAND DRYER	NC	40
41	R	RECEPTACLES		20					1080	180	20	GFCI	EWC	R	42
43	R	RECEPTACLES		20	540	250					20		WON DOOR	NC	44
45	R	RECEPTACLES		20			1080	720			20		RECEPTACLES	R	46
47	R	RECEPTACLES		20					1080	720	20		RECEPTACLES	R	48
49	R	RECEPTACLES		20	900	180					20		RECEPTACLES	R	50
51	R	REFRIGERATOR	GFCI	20			180	0			20	--	SPARE	--	52
53	R	RECEPTACLES		20					720	0	20	--	SPARE	--	54
55	--	SPACE	--	--	--	0					20	--	SPARE	--	56
57	--	SPACE	--	--			--	0			20	--	SPARE	--	58
59	--	SPACE	--	--					--	0	20	--	SPARE	--	60
					25739		24029		24793						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	4160	100%	4160	125%	5200	
BUS AMPACITY:	400A	ELECTRIC HEAT (E)	0	100%	0	100%	0	
MAIN TYPE:	MLO	NON-CONTINUOUS LOAD (NC):	21950	100%	21950	100%	21950	
MINIMUM A.I.C.:		KITCHEN LOAD (K):	0		0	100%	0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
		RECEPT DEMAND LOAD (R):	35600	50%	17800	100%	17800	
+ PROVIDE FEED-THROUGH LUGS		LIGHTING LOAD (L):	0	100%	0	125%	0	
		ADDITIONAL TRACK LIGHTING...				100%	0	
		MOTORS, HIGHEST LOAD (M):	1040	125 %	1300	100%	1300	
PANELBOARD LOCATION		MOTORS, REMAINING	1812	100 %	1812	100 %	1812	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	57.02			
				TOTAL...	158.28	TOTAL...	161.16	

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TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
TROY, MI

DRAWING TITLE

PANEL SCHEDULES

ISSUE DATES

DATE:	ISSUED FOR:
07-12-2024	ADDENDUM #2
06-18-2024	CONSTRUCTION DOCUMENTS

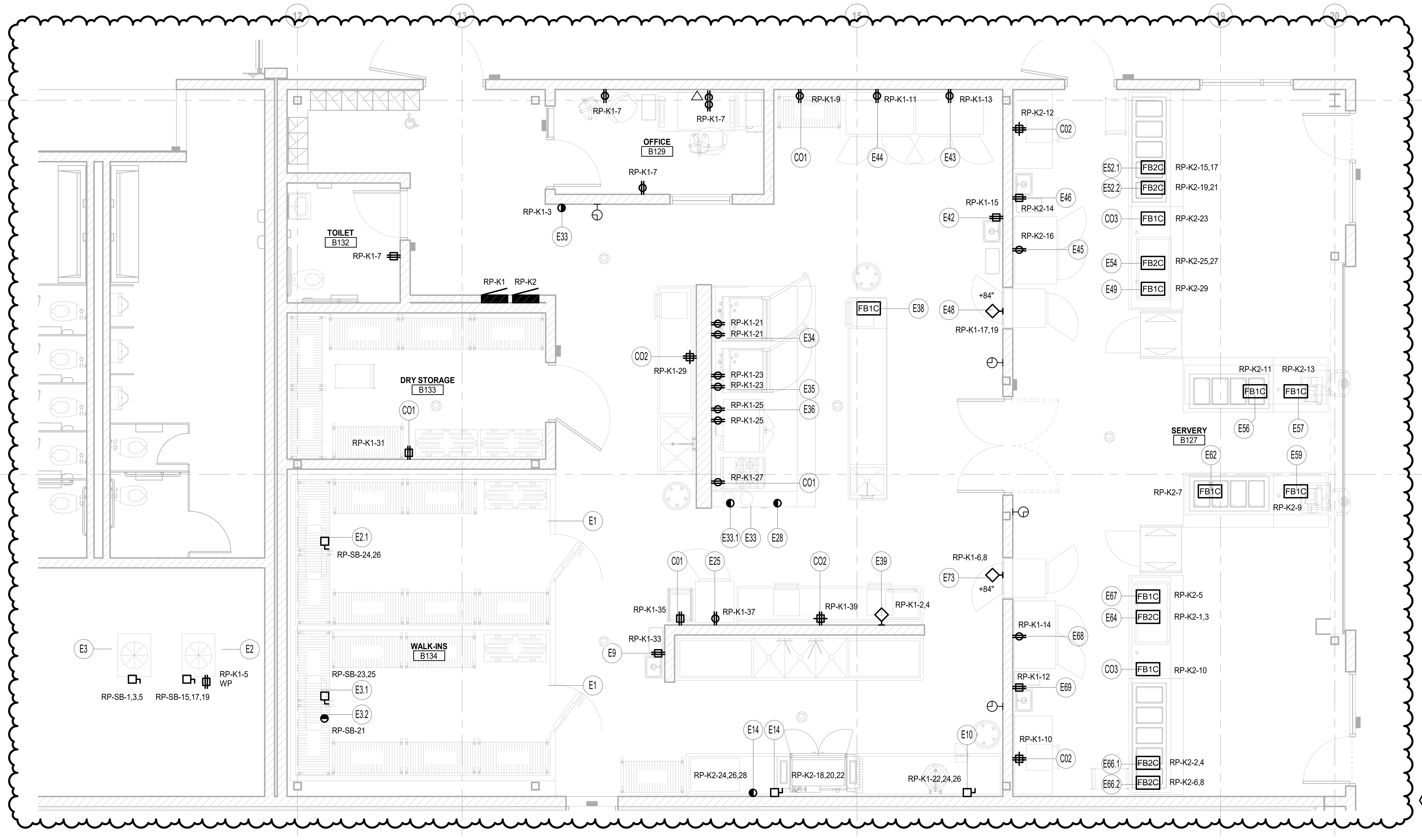
DRAWN DDS
CHECKED ZDB
APPROVED STP

PROJECT NO.
22102

DRAWING NO.
E5.5

7/11/2024 2:10:23 PM Autodesk Docs://22102_Troy Smith MS/2023-0154_TSD Smith MS_MEP_v22.rvt

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



1 E3.1B ENLARGED KITCHEN AND SERVERY ELECTRICAL PLAN

SCALE: 1/4" = 1'-0"

FOOD SERVICE EQUIPMENT SCHEDULE

ITEM NO	QTY	EQUIPMENT CATEGORY	MANUFACTURER	MODEL NUMBER	EQUIPMENT REMARKS	AMPS	KW	HP	VOLTS	PHASE	DIRECT	PLUG	NEMA	ELECTRICAL AFF (IN)	ELEC REMARKS	COLD WATER SIZE (IN)	COLD WATER AFF (IN)	HOT WATER SIZE (IN)	HOT WATER GPH	HOT WATER AFF (IN)	DIRECT DRAIN SIZE (IN)	DIRECT DRAIN AFF (IN)	INDIR DRAIN SIZE (IN)	GAS SIZE (IN)	MBTUH	GAS AFF (IN)	PLUMBING REMARKS	ITEM NO
1	1LOT	WALK IN REFRIGERATOR/FREEZER	AMERICAN PANEL	CUSTOM		20.0			120	1	X			DFA														1
2	1SYS	REMOTE REFRIGERATOR CONDENSER	AMERICAN PANEL	-	ROOF MOUNTED	9.1			208	3	X			SU														2
2.1	1	REFRIGERATOR BLOWER COIL	AMERICAN PANEL	-		1.1			208	1	X			DFA									.75				RUN TO INDIRECT WASTE	2.1
3	1SYS	REMOTE FREEZER CONDENSER	AMERICAN PANEL	-	ROOF MOUNTED	14.2			208	3	X			SU														3
3.1	1	FREEZER BLOWER COIL	AMERICAN PANEL	-		11.0			208	1	X			DFA									.75				RUN TO INDIRECT WASTE	3.1
3.2	1	HEAT TAPE	-	-		20.0			120	1	X			DFA														3.2
4	4	DUNNAGE RACK	CAMBRO	DRS480-480																								4
5	1LOT	PORTABLE WALK IN FZR, SHELVING	METRO	METROSEAL																								5
6	1LOT	PORTABLE WALK IN REF, SHELVING	METRO	METROSEAL																								6
7	1LOT	STATIONARY STORE ROOM SHELVING	METRO	-																								7
8	1	CART, UTILITY	LAKESIDE	511																								8
9	1	HAND SINK, WALL MOUNT	ADVANCE TABCO	7-PS-40	ELECTRONIC FAUCET	1.0			120	1		X	5-15P	18		0.5	18	0.5		18	1.5	21						9
10	1	DISPOSER, GARBAGE	IN-SINK-ERATOR	SS-200-18		3.3		2.0	208	3	X			18		0.5	18	0.5		18	2	12						10
11	1LOT	ST. ST. SOILED/CLEAN DISHTABLES	ST. ST. FABRICATOR	CUSTOM																			1				RUN TO INDIRECT WASTE	11
12	1	PORTABLE STORAGE SHELVING	METRO	-																								12
13	-	SPARE - NOT USED																										13
14	1	WAREWASHER, RACK CONVEYOR	HOBART US FOODSERVICE	CL44EN-ADV ELECTRIC (R-L)	SINGLE POINT	55.0			208	3	X			18		0.5	12	0.5		12			1.5				RUN TO INDIRECT WASTE	14
					BOOSTER HEAT	83.9	30		208	3	X			18														
15	1SYS	SOAP AND RINSE SYSTEM	BY OWNER	NIC																								15
16	2	ST. ST. EXHAUST DUCTS	ST. ST. FABRICATOR	CUSTOM	4 x 16																							16
17	1LOT	WIRE WALL SHELVING	METRO																									17
18	1	PORTABLE STORAGE SHELVING	METRO	-																								18
19	1LOT	ST. ST. WALL PANELING	ST. ST. FABRICATOR	CUSTOM																								19
20	1	ST. ST. PREP SINK AND TABLE	ST. ST. FABRICATOR	CUSTOM												0.5	18	0.5		18			2				RUN TO INDIRECT WASTE	20
21	1	ST. ST. WALL PANELING	ST. ST. FABRICATOR	CUSTOM																								21
22	1	ST. ST. THREE COMP SINK	ST. ST. FABRICATOR	CUSTOM												.75	18	.75		18	2	SU	2				SOILED TO GT | WASH,RINSE TO IW	22
23	1	ST. ST. WALL PANELING	ST. ST. FABRICATOR	CUSTOM	REAR AND SIDE WALL																							23
24	1	RACK, PAN	ADVANCE TABCO	PR20-3K																								24
25	1	REFRIGERATOR, REACH-IN	TRAULSEN	G10010		4.9			120		X		5-15P	84														25
26	1	ST. ST. PREP TABLE	ST. ST. FABRICATOR	CUSTOM																								26
27	1	ST. ST. WALL PANEL & CAP	ST. ST. FABRICATOR	CUSTOM																								27
28	1LOT	ST. ST. EXHAUST HOOD	CAPTIVEAIRE	-		15.0			120	1	X			DFA														28
28.1	1	EXHAUST HOOD CONTROL	CAPTIVEAIRE	-											CAT 6 FROM CABINET TO TOUCH PAD													28.1
29	1LOT	ST. ST. WALL PANELING	ST. ST. FABRICATOR	CUSTOM																								29
30	-	SPARE - NOT USED																										30
31	-	SPARE - NOT USED																										31
32	1	FIRE EXTINGUISHER	CAPTIVEAIRE	K TYPE																								32
33	1SYS	FIRE SUPPRESSION SYSTEM	CAPTIVEAIRE	-		15.0			120	1	X			DFA														33
33.1	1	ELECTRONIC GAS VALVE	CAPTIVEAIRE	-	VERIFY SIZE AND LOCATION	15.0			120	1	X			DFA														33.1
34	1	OVEN-STEAMER, COMBINATION, GAS	UNOX, INC. (NORTH AMERICA)	(2)XAVC-06FS-GPLM	HINGED PER PLAN	(2)8.0			120	1			5-20P	18/36		0.75							1	0.75	(2)82	30	RUN TO INDIRECT WASTE	34 * * *
35	1	OVEN-STEAMER, COMBINATION, GAS	UNOX, INC. (NORTH AMERICA)	(2)XAVC-06FS-GPLM	HINGED PER PLAN	(2)8.0			120	1			5-20P	18/36		0.75							1	0.75	(2)82	30	RUN TO INDIRECT WASTE	35 * * *
36	1	OVEN, CONVECTION, GAS	VULCAN	VC44GD		(2)7.7			120	1		X	5-15P	18/36										0.75	100	30		36 * * *
37	1	RANGE, RESTAURANT, GAS	VULCAN	24S-4B-N																				0.75	143	30		37 * * *
38	1	ST. ST. COOKS TABLE W/ SINK	ST. ST. FABRICATOR	CUSTOM	SHELF OVER	20.0			120	1		X		SU	COUNTER MTD RECEPTACLE	0.5	SU	0.5		SU			2				RUN TO INDIRECT WASTE	38
39	1	OVEN, MICROWAVE	PANASONIC	NE-2180		20.0	2.1		208	1		X	6-30P	48														39
40	-	SPARE - NOT USED																										40
41	-	SPARE - NOT USED																										41
42	1	HAND SINK, WALL MOUNT	ADVANCE TABCO	7-PS-40	ELECTRONIC FAUCET	1.0			120	1		X		18		0.5	18	0.5		18	1.5	21						42
43	1	REFRIGERATOR, REACH-IN	TRAULSEN	G20010		7.4		1/3	115	1		X	5-15P	84														43
44	1	FREEZER, REACH-IN	TRAULSEN	G22010		11.2		3/4	115	1		X	5-15P	84														44
45	1	REFRIGERATOR, REACH-IN	TRAULSEN	G20012		7.4		1/3	115	1		X	5-15P	84														45
46	1	HAND SINK, WALL MOUNT	ADVANCE TABCO	7-PS-40	ELECTRONIC FAUCET	1.0			120	1		X	5-15P	18		0.5	18	0.5		18	1.5	21						46
47	1	TABLE, WORK, 14 GAUGE, BACK SPLASH	ADVANCE TABCO	KSS-305																								47
48	1	CABINET, HEATED, PASS-THRU	TRAULSEN	G14312P	SEE PLAN DOOR SWING	8.3	1.5		120/208	1		X	L14-20P	84														48
49	1	REFRIGERATED SELF-SERVICE CASE	STRUCTURAL CONCEPTS	B3632		16.0			120	1		X	5-20P	SU	FLOOR RECEPTACLE													49
50	-	SPARE - NOT USED																										50
51	-	SPARE - NOT USED																										51
52	1	FLAT TOP UTILITY COUNTER	DUKE	TST-88SS	MODIFIED LENGTH																							52
52.1	1	BUFFET/CAFETERIA, HOT/COLD CONVERTIBLE	DUKE	HCF-5		17.2			120/208	1		X	L14-30P	SU	FLOOR RECEPTACLE													52.1
52.2	1	ADJ SNEEZE GUARD W/ LED & HEAT	PMG	TM2N-A	SERVED/SELF SERVE	10.0			208	1		X	L6-20P	SU	FLOOR RECEPTACLE													52.2
53	1	BUFFET/CAFETERIA, FLAT TOP	DUKE	TST-88SS																								53
54	1	DISPLAY CASE, HEATED	HATCO	GR2SDS-42D		12.4	3.0		120/208	1		X	L14-20P	SU	FLOOR RECEPTACLE													54
55	-	SPARE - NOT USED																										55
56	1	BUFFET/CAFETERIA, FLAT TOP	DUKE	TST-74SS		6.0	0.6		120	1		X	5-15P	SU	FLOOR RECEPTACLE													56
56.1	1	DROP-IN, COLD PAN	DUKE	FCP4-SB											POWERD FROM 56								0.75				RUN TO INDIRECT WASTE	56.1
56.2	1	SELF SERVE SNEEZE GUARD W/ LED LIGHTS	PMG	TM2R-F	SELF SERVE W/ LED										POWRED FROM 56													56.2
57	1	CASHIERS STAND	DUKE	TCS-30SS	MODIFIED LENGTH	20.0			120	1		X	5-15P	SU	FLOOR RECEPTACLE													57
58	1LOT	POS/CASH REGISTER SYSTEM	BY OWNER	NIC											POWRED FROM 57 & 59													58
59	1	CASHIERS STAND	DUKE	TSC-30SS	MODIFIED LENGTH	20.0			120	1		X	5-15P	SU	FLOOR RECEPTACLE													59
60	-	SPARE - NOT USED																										60
61	-	SPARE - NOT USED																										61
62	1	SELF SERVE FIXED SNEEZE GUARD	DUKE	TST-74SS	MODIFIED LENGTH	6.0	0.6		120	1		X	5-15P	SU	FLOOR RECEPTACLE													62
62.1	1	DROP-IN, COLD PAN	DUKE	FCP4-SB											POWRED FROM 62								0.75				RUN TO INDIRECT WASTE	62.1
62.2	1	SELF SERVE SNEEZE GUARD W/ LED LIGHTS	PMG	TM2R-F	SELF SERVE W/ LED										POWRED FROM 62													62.2
63	-	SPARE - NOT USED																										63
64	1	DISPLAY CASE, HEATED	HATCO	GR2SDS-42D		12.4	3.0		120/208	1		X	L14-20P	SU	FLOOR RECEPTACLE													64
65	1	BUFFET/CAFETERIA, FLAT TOP	DUKE	TST-88SS	MODIFIED LENGTH									SU	FLOOR RECEPTACLE													65
66	1	FLAT TOP UTILITY COUNTER	DUKE	TST-88SS	MODIFIED LENGTH									SU	FLOOR RECEPTACLE													66
66.1	1	BUFFET/CAFETERIA, HOT/COLD CONVERTIBLE	DUKE	HCF-5		17.2			120/208	1		X	L14-30P	SU	FLOOR RECEPTACLE													66.1
66.2	1	ADJ SNEEZE GUARD W/ LED & HEAT	DUKE	TM2N-A	SERVED/SELF SERVE	10.0			208	1		X	L6-20P	SU	FLOOR RECEPTACLE													66.2
67	1	REFRIGERATED SELF-SERVICE CASE	STRUCTURAL CONCEPTS	B3632		16.0			120	1		X	5-20P	SU	FLOOR RECEPTACLE													67
68	1	REFRIGERATOR, REACH-IN	TRAULSEN	G20013		7.4		1/3	115					84														68
69	1	HAND SINK, WALL MOUNT	ADVANCE TABCO	7-PS-40	ELECTRONIC FAUCET	1.0			120	1		X	5-15P	18		0.5	18	0.5		18	1.5	21						69
70	2	PORTABLE UTILITY CART	LAKESIDE	511	BASKET STORAGE																							70
71	-	SPARE - NOT USED																										71
72	1	TABLE, WORK, 14 GAUGE, BACK SPLASH	ADVANCE TABCO	KSS-305																								72
73	1	CABINET, HEATED, PASS-THRU	TRAULSEN	G14312P	SEE PLAN DOOR SWING	8.3	1.5		120/208	1		X	L14-20P	84														73
74	1	HOLDING CABINET, HUMIDIFIED HEATED	F.W.E.	MTU-10		13.8			120	1		X	5-15P	18														74
75	1	BUFFET/CAFETERIA, RETAIL X-TENSION	MULTITERIA	RXT 72		50			120	1		X	5-50P	18	DATA FOR REGISTER													75
76	1	REFRIGERATOR, COUNTER TOP	TRUE MFG.	GDM-06-34-HC~TSL01		1.6	0.2	1/10	115	1					POWERED FROM #75													76
77	1	DISPLAY CASE, HEATED	HATCO	GRSDS-24D		11.3	1.4		120	1					POWERED FROM #75													77
78	1	BUFFET/CAFETERIA, HOT FOOD-SOUP STATION	HATCO	GRBW-30		10.3	1.2		120	1					POWERED FROM #75													78
79	1LOT	POS/CASH REGISTER SYSTEM	BY OWNER	NIC		15.0			120	1					POWERED FROM #75													79
80	-	SPARE - NOT USED																										80
81	1LOT	FIELD ERECTION LABOR																										81
CO1		CONVENIENCE OUTLET			DEDICATED	20.0			120	1				18														CO1
CO2		CONVENIENCE OUTLET			DEDICATED	20.0			120	1				48														CO2
CO3		CONVENIENCE OUTLET			DEDICATED	20.0			120	1				SU	DUPLEX FLR RECEPTACLE													CO3
CO4		CONVENIENCE OUTLET			DEDICATED	20.0			120	1				SU	COUNTER MTD OUTLET													CO4

* * * GAS AND WATER TO STUB OUT OF WALL, DO NOT SURFACE MOUNT

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 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 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.

10 REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.

11 THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.

12 REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

13 CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.

14 PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

FOOD SERVICE GENERAL NOTES:

1 LOCATIONS, DIMENSIONS, UTILITY REQUIREMENTS, INTERCONNECTIONS, AND NEMA CONFIGURATIONS OF CORD AND PLUG ASSEMBLIES, ETC. ARE BASED ON BASIS OF DESIGN MANUFACTURER IN THE SPECIFICATIONS. COORDINATE FINAL LOCATIONS AND DEVIATIONS FROM BASIS OF DESIGN WITH FOOD SERVICE EQUIPMENT CONTRACTOR (FSEC).

2 PROVIDE GROUND-FAULT-CIRCUIT-INTERRUPTER (GFCI) FOR PERSONNEL PROTECTION, PER NEC, FOR ALL SINGLE-PHASE RECEPTACLES 150V TO GROUND OR LESS AND 50A OR LESS, AND FOR ALL THREE-PHASE RECEPTACLES 150V TO GROUND OR LESS AND 100A OR LESS. PROVIDE GFCI CIRCUIT BREAKER(S) OR REMOTE DEAD FRONT GFCI DEVICE(S), IN READILY ACCESSIBLE LOCATIONS, FOR ANY RECEPTACLE THAT CANNOT BE ACCESSED WITHOUT MOVING EQUIPMENT.

3 SEAL ALL CONDUIT PENETRATIONS TO WALK-IN COOLERS AND FREEZERS WITH FOAM AND NON-HEAT CONDUCTIVE SEALANT, IN AND AROUND CONDUIT TO ENSURE NO AIR LEAKS. CONDUIT PENETRATIONS INTO REFRIGERATOR AND/OR FREEZER SHALL BE ENT AND TRANSITIONED TO EMT OUTSIDE OF THE UNIT(S).

4 PROVIDE ALL INTERCONNECTING WIRING FOR WALK-IN REFRIGERATOR AND/OR FREEZER LIGHTS, DOOR HEATERS, COMPRESSORS, EVAPORATORS, ALARM SYSTEMS, HEATED PRESSURE RELIEF VENTS, WINDOW HEATERS, TIME CLOCKS, INTERLOCKS, ETC. WHERE UNITS ARE NOT PRE-WIRED. WIRE PER MANUFACTURER'S DRAWINGS/DIAGRAMS. INTERIOR CONDUIT RUNS ARE NOT ACCEPTABLE.

ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

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Bid Package No. 03B

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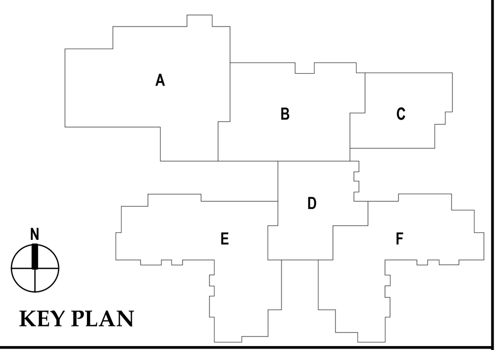
DRAWING TITLE

ENLARGED ELECTRICAL PLAN



KEY PLAN

ISSUE DATES

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PROJECT NO.
22102

DRAWING NO.
E6.1

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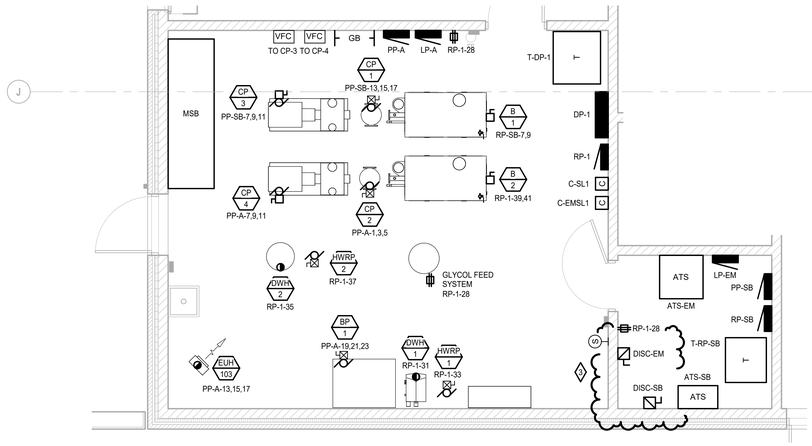
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



1 E3.1A **ENLARGED MECHANICAL ROOM ELECTRICAL PLAN**
SCALE: 1/4" = 1'-0"

ELECTRICAL GENERAL NOTES:

1 THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

5 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 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.

10 REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.

11 THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.

12 REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

13 CONNECT EXIT SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.

14 PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSABLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

CONSTRUCTION KEY NOTES:

1 MOUNT RECEPTACLES HORIZONTALLY

2 ELECTRICAL CONTRACTOR SHALL INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF ELECTRICAL BACKBOARD WINCH UP IN CEILING SPACE. ALSO INSTALL 4 POLE, TWIST LOCK, SINGLE RECEPTACLE, PROVIDED BY WINCH MANUFACTURERS, INTO THE JUNCTION BOX.

3 ELECTRICAL CONTRACTOR SHALL INSTALL ALL CONTROLS, PUSHBUTTONS, KEY SWITCHES ETC. (PROVIDED WITH EACH BASKETBALL BACKBOARD), FOR A COMPLETE OPERABLE SYSTEM. KEY SWITCHES GANGED IN PAIRS IN ONE COVER PLATE TO CONTROL THE BACKSTOP SWING AND HEIGHT ADJUSTER.

4 HEAT TRACE, BY OTHERS.

5 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/R/T/U 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.

6 REFER TO ARCHITECTURAL FLOOR PLANS, DOOR HARDWARE SCHEDULE ON ARCHITECTURAL DRAWINGS, ACCESS CONTROL SYSTEM SPECIFICATION SECTION AND ACCESS CONTROL DOOR DIAGRAM(S) ON E7 SERIES FOR RACEWAY AND BACK BOX REQUIREMENTS FOR DOOR OR BANK OF DOORS INDICATED. PROVIDE ALL RACEWAYS AND BACK BOXES REQUIRED. COORDINATE WITH DOOR HARDWARE AND SECURITY CONTRACTORS.

7 PROVIDE 2-2" AND 1-1" U.O.N. CONDUITS FOR TECHNOLOGY AND AUXILIARY SYSTEM WIRE AS INDICATED. STUB CONDUITS FROM CEILING SPACE. PROVIDE PLASTIC BUSHINGS AT EACH END. PROVIDE REMOVABLE/RESEALABLE FIRE STOP PUTTY IN EACH CONDUIT AND FIRE STOP AROUND EACH CONDUIT. COORDINATE WITH TECHNOLOGY CONTRACTOR FOR EXACT LOCATION OF CONDUIT. PROVIDE MINIMUM OF 1" CONDUIT FOR ALL OTHER AREAS REQUIRING SLEEVES.

8 PROVIDE (1)2" CONDUIT WITH PULL STRING AND BUSHINGS FOR TECHNOLOGY. ROUTE UNDER BUILDING AND TERMINATE AT EXTERIOR OF BUILDING.

9 COORDINATE MOUNTING LOCATION WITH TECHNOLOGY CONTRACTOR.

10 CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND FIRE ALARM SYSTEM. ROLL-UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.

11 HAND DRYERS FURNISHED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL TRADES.

12 SMOKE DAMPER DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT DETECTOR TO FIRE ALARM SYSTEM, AND CIRCUIT DAMPER ACTUATOR. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WORK WITH THE TEMPERATURE CONTROLS CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED AIR HANDLER, DAMPER SHALL ALSO CLOSE UPON NORMAL SHUTDOWN OF AIR HANDLER.

13 CARBON MONOXIDE DETECTOR. COORDINATE QUANTITY WITH FIRE MARSHAL.

14 SCOREBOARD. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH IN.

15 WALL MOUNT TRANSFORMER.

16 ELECTRIC RANGE. PROVIDE WALL MOUNTED GFCI MODULE ABOVE COUNTER.

17 LIGHTING RELAY PANEL FOR THEATRICAL LIGHTING SYSTEM. REFER TO THEATRICAL LIGHTING EQUIPMENT DRAWINGS.

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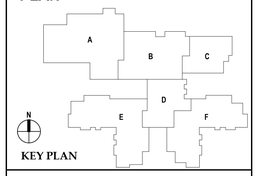

KEY PLAN

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APPROVED	STP

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E6.2

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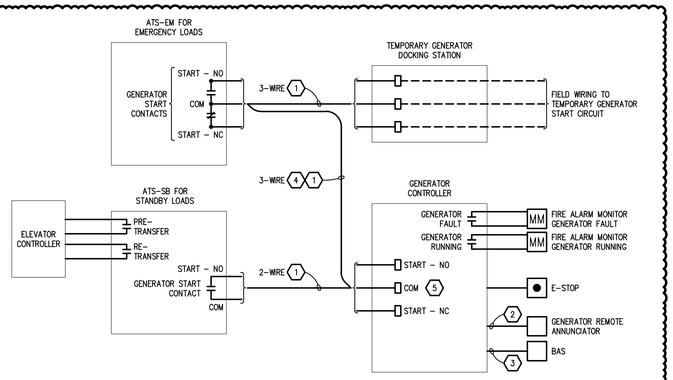


GENERATOR AND ATS CONTROL WIRING DETAIL EMERGENCY AND STANDBY

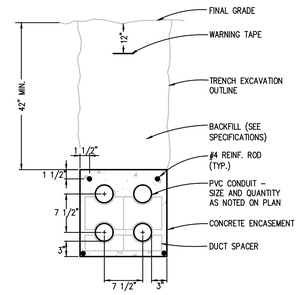
NO SCALE

NOTES:

1. VERIFY ALL WIRE AND CABLE SPECIFICATIONS WITH GENERATOR SUBMITTAL DRAWINGS, WIRING DIAGRAMS, AND MANUFACTURER'S REQUIREMENTS.
2. PROVIDE CONDUIT FOR ALL CONTROL WIRING. PROVIDE 14 AWG THHN/THWN FOR CONTROL WIRING UNLESS OTHERWISE NOTED.

KEYED NOTES:

1. SEPARATE SIGNAL WIRING FROM OTHER SYSTEMS. PROVIDE DEDICATED CONDUIT FROM GENERATOR TO ATS.
2. PROVIDE SHIELDED TWISTED PAIR (PER MANUFACTURER'S RECOMMENDATIONS) AND 2#14 FOR ANNUNCIATOR DC POWER.
3. PROVIDE SHIELDED TWISTED PAIR FOR COMMUNICATION LINK. COORDINATE WITH BAS INTEGRATOR.
4. PROVIDE 2 HOUR CABLE ASSEMBLY OR EQUIVALENT MEANS OF PROTECTION FOR START SIGNAL WIRING.
5. PROVIDE CIRCUIT INTEGRITY MONITORING AT GENERATOR.
6. PROVIDE RETRANSFER INHIBIT WHERE THE EMERGENCY TRANSFER SWITCH NORMAL SUPPLY IS FED FROM STANDBY DISTRIBUTION.

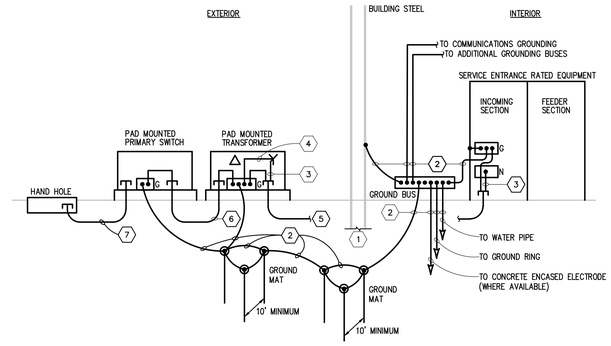


CONCRETE ENCASED DUCT BANK DETAIL

NO SCALE

NOTES:

1. QUANTITY AND CONFIGURATION OF DUCTS SHALL BE AS SHOWN ON PLAN DRAWINGS. PROVIDE CONDUIT TYPES AS SPECIFIED.

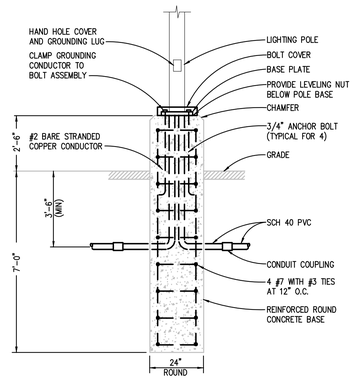


GROUNDING SYSTEM DIAGRAM PRIMARY SERVICE EXTERIOR SERVICE ENTRANCE EQUIPMENT

NO SCALE

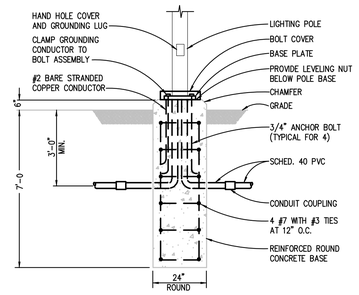
KEYED NOTES:

1. METAL IN-GROUND SUPPORT STRUCTURE IN DIRECT CONTACT WITH EARTH VERTICALLY FOR A MINIMUM OF 10FT, WHERE AVAILABLE.
2. GROUNDING ELECTRODE CONDUCTOR, #4/0 COPPER.
3. GROUNDED CONDUCTOR (NEUTRAL), SEE ONE LINE DIAGRAM.
4. SYSTEM BONDING JUMPER, PROVIDED BY MANUFACTURER AS PART OF LISTED EQUIPMENT PER NEC 250.30A AND 250.30C, SIZED PER NEC 250.28 AND 250.102.
5. PHASE CONDUCTORS, GROUNDED CONDUCTOR, AND SUPPLY SIDE BONDING JUMPER IN CONDUIT (3P,N,SSBJ). SEE ONE LINE DIAGRAM.
6. PRIMARY PHASE CONDUCTORS AND GROUND IN CONDUIT. SEE ONE LINE DIAGRAM.
7. FUTURE E.V. CHARGING STATION. SEE ONE LINE DIAGRAM.



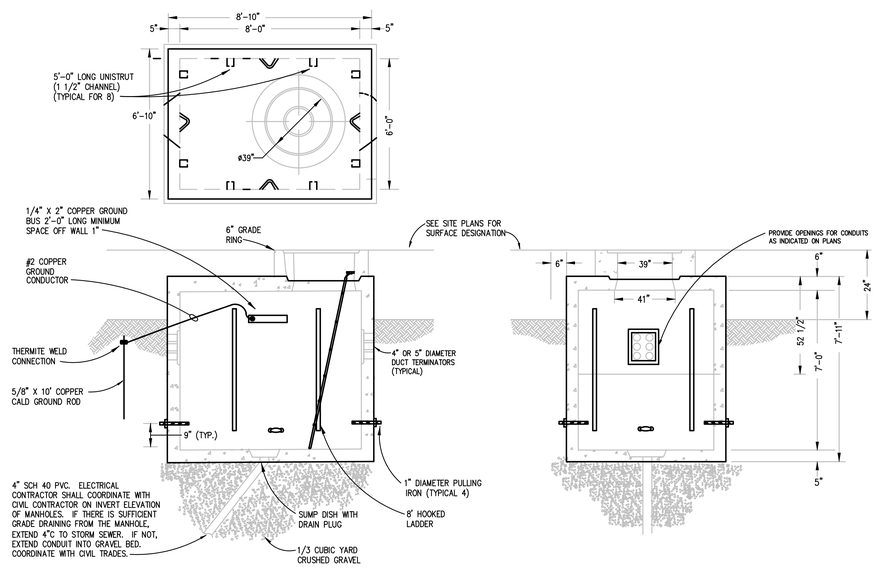
PARKING LOT LIGHTING POLE BASE DETAIL

NO SCALE



LIGHTING POLE BASE DETAIL IN LANDSCAPE

NO SCALE



DETAIL OF CONCRETE MANHOLE

NO SCALE

NOTES:

1. COORDINATE EXACT MANHOLE LOCATIONS WITH CIVIL DRAWINGS.

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E7.1

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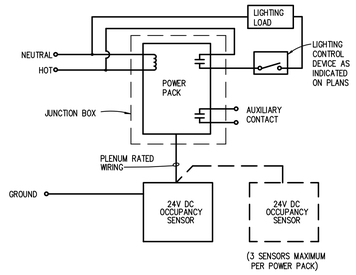
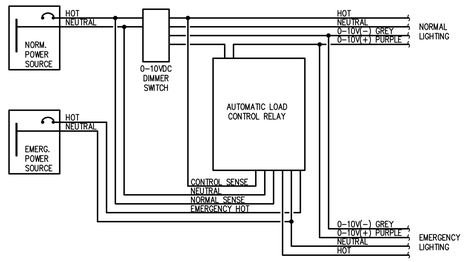


NOTES:

1. REFER TO SPECIFICATIONS FOR ACCEPTED MANUFACTURERS.
2. PROVIDE POWER PACKS AND SLAVE PACKS AS REQUIRED FOR SWITCHING AS INDICATED ON PLAN. REVISE DETAIL AS REQUIRED BY MANUFACTURER.
3. MOUNTING LOCATION PER MANUFACTURER'S RECOMMENDATION.
4. ADJUST SENSITIVITY LEVELS PER THE OWNER REQUIREMENTS.
5. PROVIDE FACTORY SUPPORT FOR AIMING/ADJUSTING OF SENSORS.
6. PLACE CEILING MOUNTED OCCUPANCY SENSORS IN CENTER OF A FULL CEILING TILE, WHERE APPLICABLE.
7. SENSOR ADJUSTMENT: BEFORE MAKING ADJUSTMENTS, MAKE SURE ROOM FURNITURE IS INSTALLED, LIGHTING CIRCUITS ARE TURNED ON, AND THE HVAC SYSTEMS ARE IN THE ON POSITION. VAV SYSTEMS SHOULD BE SET TO THEIR HIGHEST AIRFLOW. SET THE LOGIC CONFIGURATION DIP SWITCHES TO "EITHER". EITHER REQUIRES MOTION DETECTION BY ONLY ONE TECHNOLOGY. SET THE TIME DELAY PER OWNERS DIRECTION.

OCCUPANCY SENSOR WIRING DIAGRAM

NO SCALE

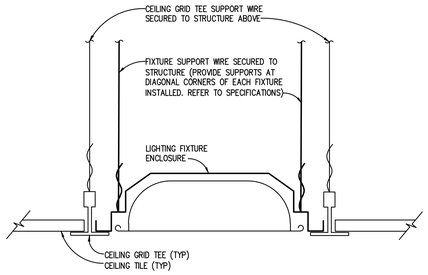


AUTOMATIC LOAD CONTROL RELAY FOR 0-10V DIMMING

NO SCALE

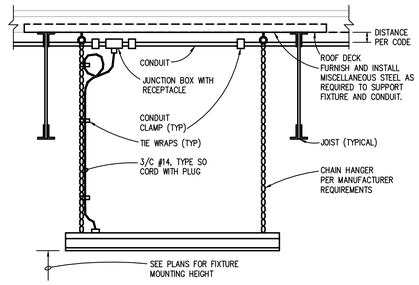
NOTES:

1. BASIS OF DESIGN IS LVS CONTROLS EPC-2-D. REFER TO SPECIFICATIONS FOR APPROVED MANUFACTURERS. ADJUST WIRING AS NECESSARY FOR OTHER APPROVED MANUFACTURERS.
2. PROVIDE ONE AUTOMATIC LOAD CONTROL RELAY PER SWITCHING CIRCUIT.



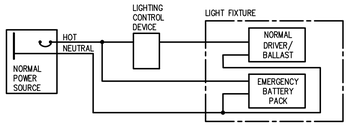
RECESSED LIGHTING FIXTURE INSTALLATION DETAIL

NO SCALE

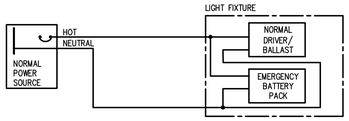


TYPICAL MOUNTING DETAIL FOR CHAIN HUNG LIGHTING FIXTURES

NO SCALE



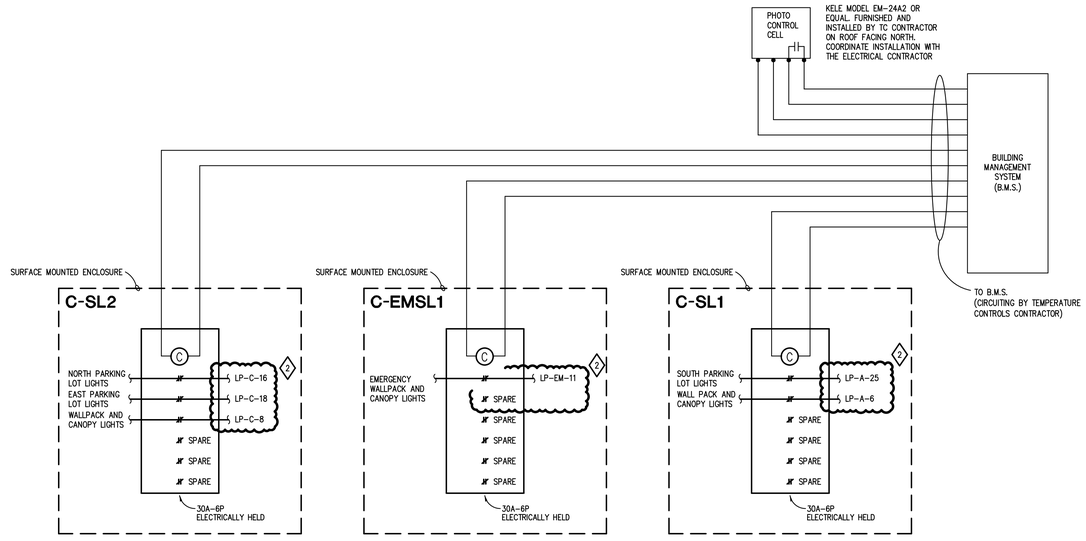
SWITCHED (NON-NIGHT LIGHT EMERGENCY FIXTURE)



UNSWITCHED (NIGHT LIGHT EMERGENCY FIXTURE)

EMERGENCY BATTERY BACKUP WIRING DIAGRAM - INTERNAL TO LIGHT FIXTURE

NO SCALE

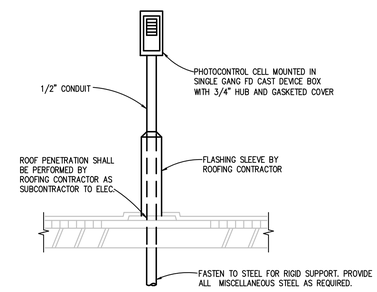


EXTERIOR LIGHTING CONTROL CONTACTOR DETAILS

NO SCALE

NOTES:

1. REFER TO PLANS FOR CONTACTOR LOCATIONS
2. CONTACTOR ENCLOSURE SHALL BE 20"X20" WITH HINGED DOOR AND LATCH.
3. PROGRAM B.M.S. SYSTEM TIME SCHEDULE PER OWNER DIRECTION.
4. LIGHTING SHALL BE PHOTO-CELL ON AND B.M.S. CONTROL OFF OR AS DIRECTED BY OWNER.



PHOTOCONTROL CELL MOUNTING DETAIL

NO SCALE

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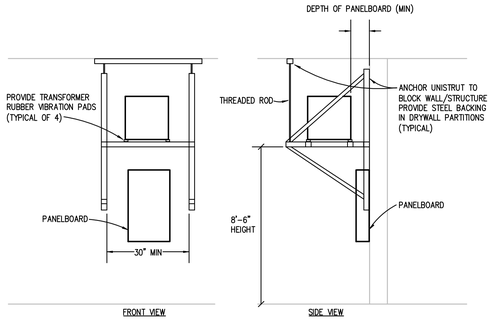
PROJECT NO.

22102

DRAWING NO.

E7.2

g:\2023\2023-0154-00\CAD\2023-0154-E7-DT.dwg, E7.2, 7/11/2024 2:08:52 PM, Suha A. Matti, None ,0.09448, Peter Basso Associates Inc.

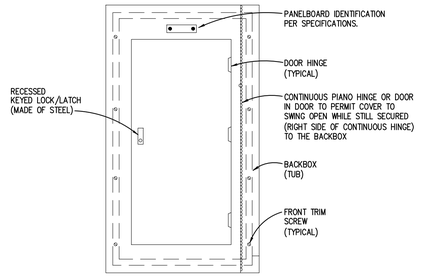


WALL MOUNTED TRANSFORMER DETAIL

NO SCALE

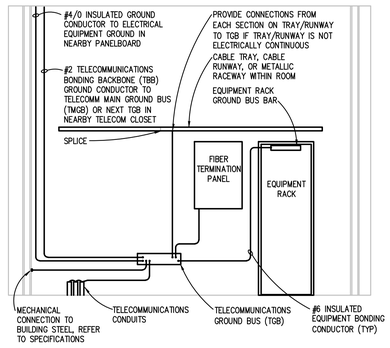
NOTE:

ELECTRICAL CONTRACTOR SHALL CONSTRUCT UNISTRUT SUPPORT STAND AND BRACING AS SHOWN. ALL UNISTRUT SHALL BE P1000I WITH ALL REQUIRED MISCELLANEOUS BRACKETS, FITTINGS, SPRING NUTS, BOLTS, CLAMPS, WASHERS, ETC. FOR A COMPLETE AND SAFE INSTALLATION.



PANELBOARD FRONT COVER DETAIL

NO SCALE

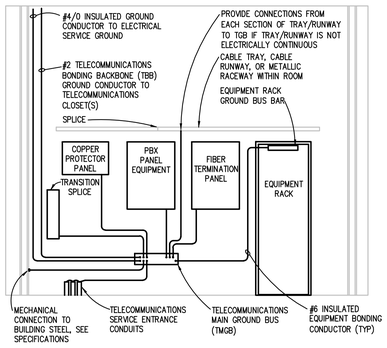


TELECOMMUNICATIONS ROOM GROUNDING DETAIL(TECH E140, E240, F126

NO SCALE

NOTES:

1. ALL GROUNDING SHALL COMPLY WITH NEC ARTICLE 250 AND TIA/EIA-607.
2. CONNECT ALL EQUIPMENT RACKS TO TGB WITH A SEPARATE EQUIPMENT BONDING CONDUCTOR.

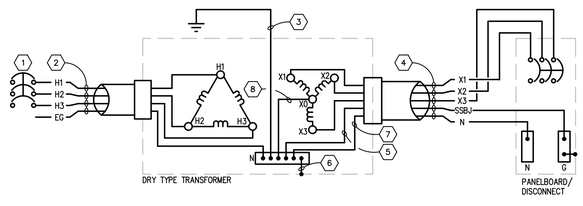


MAIN TELECOMMUNICATIONS ROOM GROUNDING DETAIL (TECH A138)

NO SCALE

NOTES:

1. ALL GROUNDING SHALL COMPLY WITH NEC ARTICLE 250 AND TIA/EIA-607.
2. CONNECT ALL EQUIPMENT RACKS INCLUDING MAIN DISTRIBUTION FRAME (MDF) TO TMGB WITH A SEPARATE EQUIPMENT BONDING CONDUCTOR.

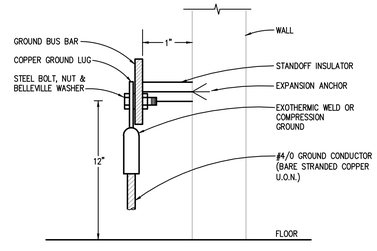


DRY TYPE DISTRIBUTION TRANSFORMER GROUNDING ARRANGEMENT

NO SCALE

(#) KEYED NOTES:

1. 480V, 3ø PRIMARY CIRCUIT BREAKER BASED ON DRY TYPE DISTRIBUTION TRANSFORMER CIRCUIT SIZING SCHEDULE ON ELECTRICAL STANDARD SCHEDULE DRAWING UNLESS OTHERWISE NOTED.
2. PRIMARY FEEDER BASED ON FEEDER AND BRANCH CIRCUIT SIZING TABLE ON ELECTRICAL STANDARD SCHEDULE DRAWING UNLESS OTHERWISE NOTED.
3. GROUNDING ELECTRODE CONDUCTOR TO NEAREST GROUNDING ELECTRODE (i.e. BUILDING STEEL, METAL WATER PIPE, GROUND RING, OR GROUND BUS). SEE DRY TYPE DISTRIBUTION TRANSFORMER CIRCUIT SIZING SCHEDULE ON ELECTRICAL STANDARD SCHEDULE DRAWING FOR SIZE UNLESS OTHERWISE NOTED.
4. 208Y/120V, 3ø, 4W SECONDARY FEEDER BASED ON DRY TYPE DISTRIBUTION TRANSFORMER CIRCUIT SIZING SCHEDULE ON ELECTRICAL STANDARD SCHEDULE DRAWING UNLESS OTHERWISE NOTED.
5. SUPPLY SIDE BONDING JUMPER.
6. SYSTEM BONDING JUMPER.
7. GROUNDED CONDUCTOR (NEUTRAL).
8. NEUTRAL CONDUCTOR PROVIDED WITH EQUIPMENT.



GROUND BUS DETAIL

NO SCALE

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

ELECTRICAL DETAILS AND DIAGRAMS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

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CHECKED	ZDB
APPROVED	STP

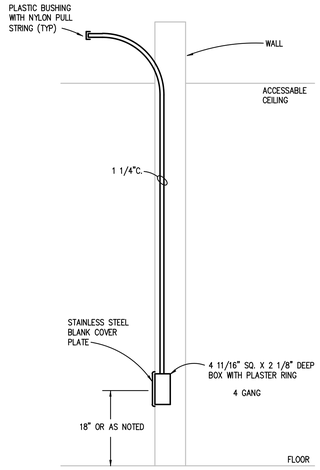
PROJECT NO.

22102

DRAWING NO.

E7.3

g:\2023\2023-0154-00\CAD\2023-0154-E7-01.dwg, E7.3, 6/17/2024 10:59:56 AM, Rachel L. Wilson, None ,0.09448, Peter Basso Associates Inc.

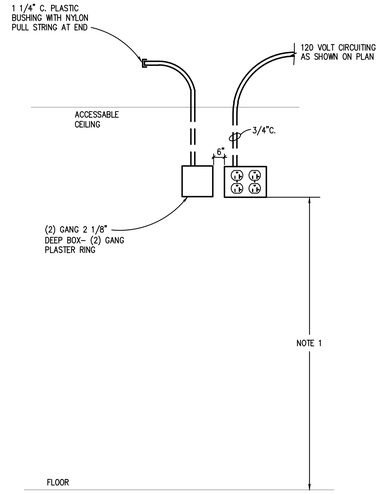


RECESSED TELECOMMUNICATION OUTLET DETAIL

NO SCALE

NOTES:

1. COORDINATE FINAL TECHNOLOGY OUTLET AND ASSOCIATED POWER LOCATIONS WITH TECHNOLOGY CONTRACTOR PRIOR TO ROUGH IN.
2. FOR INSTALLATION IN NEW WALLS PROVIDE CONDUITS AS INDICATED.
3. DATA DEVICES SHALL BE PROVIDED BY TECHNOLOGY CONTRACTOR.
4. PROVIDE BLANK STAINLESS STEEL FACEPLATE FOR ALL TECHNOLOGY OUTLETS.

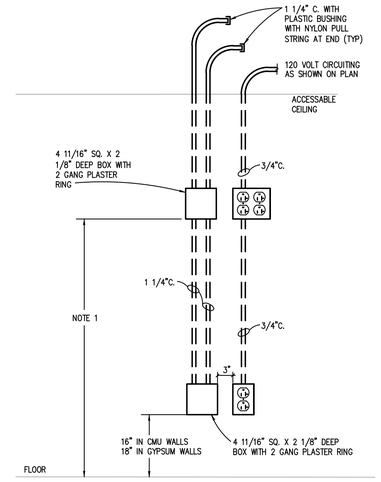


M1 RECESSED MOUNTED MONITOR DETAIL

NO SCALE

NOTES:

1. COORDINATE FINAL TECHNOLOGY OUTLET AND ASSOCIATED POWER LOCATIONS WITH TECHNOLOGY CONTRACTOR PRIOR TO ROUGH IN.
2. FOR INSTALLATION IN NEW WALLS PROVIDE CONDUITS AS INDICATED.
3. DATA DEVICES SHALL BE PROVIDED BY TECHNOLOGY CONTRACTOR.
4. PROVIDE BLANK STAINLESS STEEL FACEPLATE FOR ALL TECHNOLOGY OUTLETS.

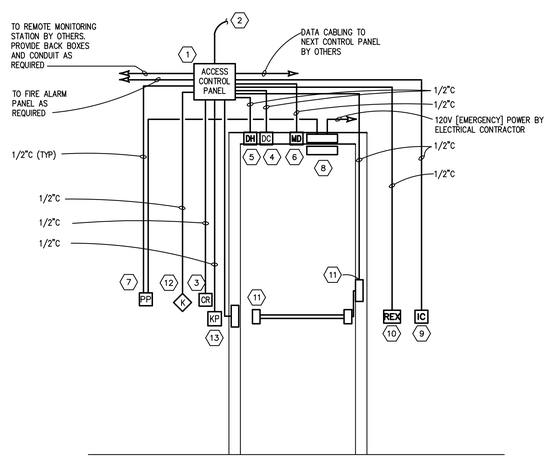


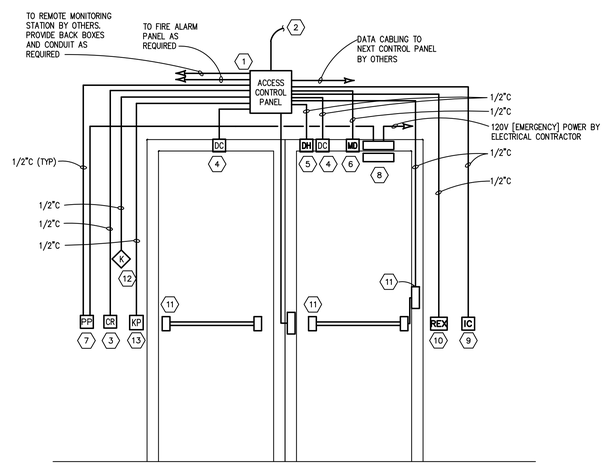
M2 RECESSED MOUNTED MONITOR DETAIL

NO SCALE

NOTES:

1. COORDINATE FINAL TECHNOLOGY OUTLET AND ASSOCIATED POWER LOCATIONS WITH TECHNOLOGY CONTRACTOR PRIOR TO ROUGH IN.
2. FOR INSTALLATION IN NEW WALLS PROVIDE CONDUITS AS INDICATED.
3. DATA DEVICES SHALL BE PROVIDED BY TECHNOLOGY CONTRACTOR.
4. PROVIDE BLANK STAINLESS STEEL FACEPLATE FOR ALL TECHNOLOGY OUTLETS.





TYPICAL ACCESS CONTROL SINGLE AND DOUBLE DOOR CONNECTION DIAGRAM

NO SCALE

GENERAL NOTES:

1. REFER TO ELECTRICAL FLOOR PLANS FOR DOOR LOCATIONS.
2. ELECTRICAL CONTRACTOR SHALL PROVIDE BACK BOXES, CONDUIT, 120 VOLT WIRING AND TERMINATIONS AS REQUIRED BY MANUFACTURE.
3. ACCESS CONTROL CONTRACTOR SHALL PROVIDE EQUIPMENT DEVICES AND ALL LOW VOLTAGE WIRING AND TERMINATIONS.
4. SOME DEVICES INDICATED MAY NOT APPLY REFER TO DOOR HARDWARE AND DOOR SCHEDULE. COORDINATE ALL WORK WITH HARDWARE CONTRACTOR.
5. ELECTRICAL CONTRACTOR SHALL PROVIDE INTERCONNECTION WITH FIRE ALARM PANEL TO RELEASE DOORS I.E. ELECTROMAGNETIC LOCKS UPON AN ALARM CONDITION, AS REQUIRED.

KEYED NOTES:

1. ACCESS CONTROL SYSTEM, DOOR PANEL BY OTHERS.
2. LOW VOLTAGE CABLING, BY OTHERS.
3. PROXIMITY CARD READER, BY OTHERS.
4. DOOR MONITOR CONTACT SWITCH, BY OTHERS.
5. DOOR HOLDER, BY OTHERS. ELECTROMAGNETIC SWITCH MOUNTED ON/IN DOOR AND FRAME. [FOR DELAYED OPERATION] IN LIEU OF ELECTRIC STRIKE.
6. MOTION DETECTOR, BY OTHERS. REQUEST TO EXIT MOTION DETECTOR MOUNTED TO TOP OF DOOR FRAME. COORDINATE WITH DOOR AND FRAME CONTRACTOR.
7. DOOR OPERATOR PUSH PLATE, BY OTHERS.
8. DOOR OPERATOR, BY OTHERS.
9. INTERCOM STATION, BY OTHERS.
10. REQUEST TO EXIT PUSH PAD, BY OTHERS.
11. ELECTRIC STRIKE, PANIC HARDWARE, POWER TRANSFER, BY OTHERS.
12. KEY-SWITCH, BY OTHERS.
13. KEYPAD, BY OTHERS.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

ELECTRICAL DETAILS AND DIAGRAMS

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22102

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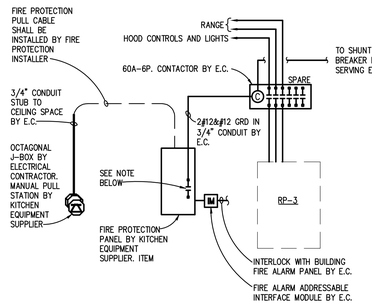
E7.4

g:\2023\2023-0154-00\CAD\2023-0154-E7-DT.dwg, E7.4, 6/17/2024 10:59:58 AM, Rachel L. Wilson, None ,0.09448, Peter Basso Associates Inc.

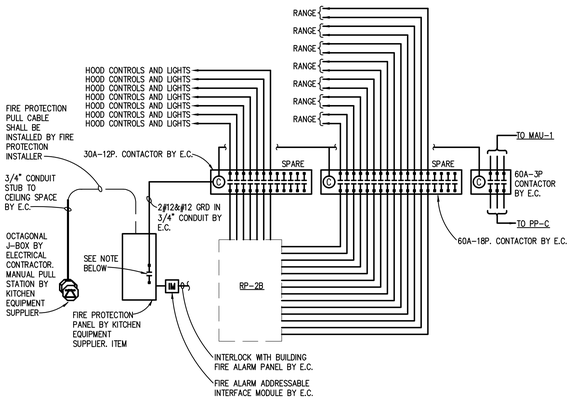


SPECIAL ED2 D122 FIRE PROTECTION WIRING DETAIL

NO SCALE

NOTE:

ELECTRICAL CONTRACTOR SHALL FIELD VERIFY VOLTAGE, AND TYPE (NORMAL OPEN/CLOSED) CONTACT IN FIRE PROTECTION PANEL, AND PROVIDE CONTACTOR TO OPERATE ACCORDINGLY. EXHAUST FAN SHALL TURN ON UPON ACTIVATION OF ANSUL SYSTEM.

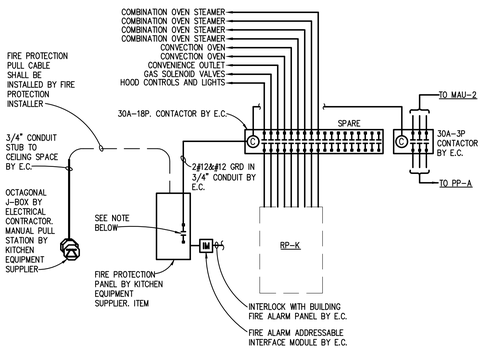


LIFE SKILLS C103 FIRE PROTECTION WIRING DETAIL

NO SCALE

NOTE:

ELECTRICAL CONTRACTOR SHALL FIELD VERIFY VOLTAGE, AND TYPE (NORMAL OPEN/CLOSED) CONTACT IN FIRE PROTECTION PANEL, AND PROVIDE CONTACTOR TO OPERATE ACCORDINGLY. EXHAUST FAN SHALL TURN ON UPON ACTIVATION OF ANSUL SYSTEM.

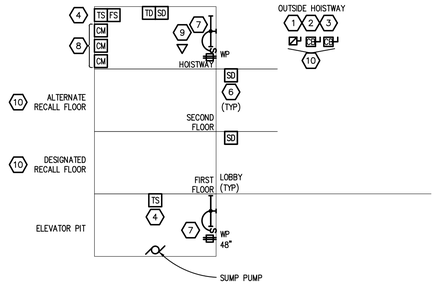


KITCHEN B128 FIRE PROTECTION WIRING DETAIL

NO SCALE

NOTE:

ELECTRICAL CONTRACTOR SHALL FIELD VERIFY VOLTAGE, AND TYPE (NORMAL OPEN/CLOSED) CONTACT IN FIRE PROTECTION PANEL, AND PROVIDE CONTACTOR TO OPERATE ACCORDINGLY. EXHAUST FAN SHALL TURN ON UPON ACTIVATION OF ANSUL SYSTEM.



ELEVATOR DETAIL - MACHINE ROOMLESS

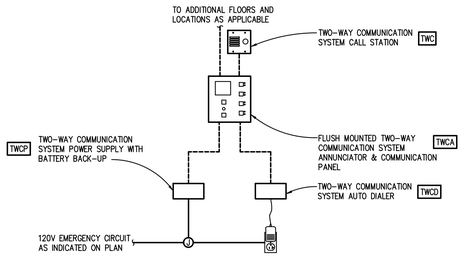
NO SCALE

GENERAL NOTES:

1. DETAIL SHOWS GENERAL EXTENT OF WORK AND SHOULD NOT BE CONSIDERED A FABRICATION DRAWING. REFER TO PLANS FOR LOCATIONS OF ROOMS, ELEVATOR SHAFT(S), ETC. COORDINATE REQUIREMENTS WITH ELEVATOR MANUFACTURER AND INSTALLER.
2. PIT LIGHTING SHALL BE IP66, WET LOCATION LISTED. PIT TO BE ILLUMINATED TO 10 FOOT-CANDLES AT FLOOR.
3. HOISTWAY MACHINE SPACE LIGHTING SHALL BE IP66, WET LOCATION LISTED AND BE ILLUMINATED TO 19 FOOTCANDLES.
4. ELEVATOR HOISTWAY TO BE DEDICATED FOR ELEVATOR EQUIPMENT ONLY.
5. ELEVATOR THRESHOLD LIGHTING TO BE 10 FOOT-CANDLES MINIMUM.
6. HOISTWAY MACHINE SPACE AND ELEVATOR PIT LIGHTING AND RECEPTACLES SHALL BE SERVED FROM SEPARATE BRANCH CIRCUITS. HOISTWAY MACHINE SPACE LIGHTING AND RECEPTACLES MUST BE SERVED FROM SEPARATE BRANCH CIRCUITS. THE ELEVATOR PIT RECEPTACLES AND LIGHTING CAN BE SERVED FROM THE SAME CIRCUIT AS LONG AS THE LIGHTING IS CONNECTED TO THE LINE SIDE AHEAD OF THE GFCI DEVICE (NEC 620.23, 630.24).
7. ELEVATOR EMERGENCY PHONE MUST BE MONITORED 24 HOURS A DAY BY AUTHORIZED PERSONAL, HAVE THE ABILITY TO BE CALLED REMOTELY, AND STAY OPERATIONAL DURING EMERGENCY CONDITIONS
8. REFER TO NEW WORK PLANS FOR ALL CIRCUITING, LIGHTING FIXTURE TYPES, AND LIGHTING FIXTURE QUANTITIES.

KEYED NOTES:

1. DISCONNECT SWITCH OR ENCLOSED CIRCUIT BREAKER CAPABLE OF BEING LOCKED OFF FOR ELEVATOR CONTROLLER. GROUND CONDUCTOR TO BE SAME SIZE AS PHASE CONDUCTORS. COORDINATE EXACT MOUNTING LOCATION AND REQUIREMENTS WITH ELEVATOR CONTRACTOR. DISCONNECTING MEANS FOR ELEVATOR CAPABLE OF BEING LOCKED OFF. LOCATE IN A DEDICATED SPACE WITHIN 25' OF LANDING THAT CONTAINS THE ELEVATOR CONTROL.
2. PROVIDE 20A/1P ENCLOSED CIRCUIT BREAKER CAPABLE OF BEING LOCKED OFF FOR ELEVATOR CAB LIGHTING. COORDINATE EXACT MOUNTING LOCATION AND REQUIREMENTS WITH ELEVATOR CONTRACTOR.
3. PROVIDE 20A/1P ENCLOSED CIRCUIT BREAKER CAPABLE OF BEING LOCKED OFF FOR ELEVATOR AND AUXILIARY CONTROLS. COORDINATE EXACT MOUNTING LOCATION AND REQUIREMENTS WITH ELEVATOR CONTRACTOR.
4. PROVIDE FIRE ALARM SYSTEM COMPONENTS AS REQUIRED AND PROVIDE CONNECTIONS TO EACH TAMPER AND FLOW SWITCH PROVIDED WITH THE FIRE PROTECTION SYSTEM. COORDINATE EXACT LOCATIONS, QUANTITIES, AND REQUIREMENTS WITH FIRE SUPPRESSION CONTRACTOR.
5. PROVIDE REQUIRED CONDUIT, WIRING, AND CONNECTIONS BETWEEN SUMP PUMP CONTROL PANEL(S) AND SUMP PUMP(S). COORDINATE REQUIREMENTS WITH MECHANICAL TRADES AND SUMP PUMP MANUFACTURER.
6. THE LOBBY ELEVATOR SMOKE DETECTORS SHALL BE WITHIN 21' OF THE DOOR CENTERLINE. FOR LOBBIES WITH CEILINGS HIGHER THAN 15', THE SMOKE DETECTOR SHALL BE INSTALLED WITHIN 60" OF THE TOP OF THE ELEVATOR DOOR. (NFPA 72 2019 21.3.5)
7. COORDINATE GFCI RECEPTACLE, LIGHT SWITCH AND LIGHT FIXTURE PLACEMENT IN PIT/HOISTWAY WITH ELEVATOR MANUFACTURER DRAWINGS AND TRADES. LIGHT SWITCH TO BE LOCATED AT TOP OF LADDER. CIRCUIT GFCI RECEPTACLE AND LIGHT FIXTURE AS INDICATED ON PLAN.
8. FIRE ALARM CONTROL MODULES FOR ELEVATOR RECALL. REFER TO FIRE ALARM MATRIX FOR CONTROL MODULE FUNCTIONALITY. CONTROL MODULES TO BE LOCATED WITHIN 3' OF ELEVATOR CONTROLLER (NFPA 72 2019 21.2.4).
9. PROVIDE TELEPHONE LINE FOR ELEVATOR EMERGENCY PHONE. REFER TO SPECIFICATIONS FOR CABLE TYPE.
10. COORDINATE EXACT DESIGNATED AND ALTERNATE RECALL FLOOR WITH ARCHITECT AND ELEVATOR MANUFACTURER AND INSTALLER.
11. PROVIDE CONDUIT AND CONTROL WIRING BETWEEN ATS AND ELEVATOR CONTROLLER FOR STANDBY POWER OPERATION SEQUENCING.



AREA OF REFUGE (AREA OF RESCUE ASSISTANCE) EMERGENCY TWO-WAY COMMUNICATION SYSTEM DIAGRAM - EMERGENCY POWER

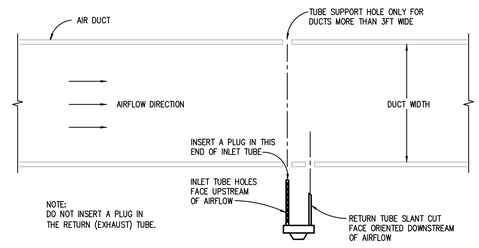
NO SCALE

NOTES:
1. REFER TO SPECIFICATIONS FOR SYSTEM REQUIREMENTS.
2. REFER TO PLANS FOR SYSTEM DEVICE LOCATIONS.

		SYSTEM OUTPUTS																												
		ANNUNCIATION											NOTIFICATION							FIRE SAFETY										
		INITIATE FIRE ALARM SIGNAL	INITIATE CARBON MONOXIDE ALARM SIGNAL	IDENTIFY ALARM AT FACP	IDENTIFY ALARM AT REMOTE ANNUNCIATOR(S)	ANNUNCIATE SUPERVISORY SIGNAL AT FACP	ANNUNCIATE SUPERVISORY SIGNAL AT REMOTE ANNUNCIATOR(S)	ANNUNCIATE TROUBLE SIGNAL AT FACP	ANNUNCIATE TROUBLE SIGNAL AT REMOTE ANNUNCIATOR(S)	ACTUATE ALARM SEQUENCE ON EXISTING FACP	ACTIVATE ELEVATOR LOBBY "FLASH HAT" WARNING	ACTIVATE IN ELEVATOR IN-CAR WARNING SIGNAL	DISPLAY ELEVATOR RECALL STATUS AT ANNUNCIATOR	OPERATE ALARM NOTIFICATION APPLIANCES CONTINUOUSLY	ACTIVATE VOICE/ALARM COMMUNICATION SYSTEM	TRANSMIT ALARM SIGNAL TO REMOTE ALARM RECEIVING STATION	TRANSMIT SUPERVISORY SIGNAL TO REMOTE ALARM RECEIVING STATION	TRANSMIT TROUBLE SIGNAL TO REMOTE ALARM RECEIVING STATION	TRANSMIT ALARM SIGNAL TO BUILDING AUTOMATION SYSTEM	TRANSMIT TROUBLE SIGNAL TO BUILDING AUTOMATION SYSTEM	RECORD EVENTS IN THE SYSTEM MEMORY	UNLOCK ELECTRIC DOOR LOCKS IN DESIGNATED EGRESS PATHS	DISABLE SOUND MASKING, PAGING, OR AUDIO SYSTEMS	RELEASE FIRE AND SMOKE DOORS	TURN ON EGRESS LIGHTING TO FULL BRIGHTNESS	OPEN AUTOMATIC SMOKE EXHAUST DOORS AND MAKE-UP DAMPERS	SHUTDOWN HVAC UNIT SERVING ZONE IN ALARM VIA CONTROL MODULE (INTERLOCK)	SWITCH HVAC EQUIPMENT CONTROLS TO FIRE ALARM MODE	CLOSE SMOKE DAMPERS IN AIR DUCT SYSTEM SERVING ZONE WHERE ALARM WAS INITIATED	RECALL ELEVATOR TO DESIGNATED RECALL LEVEL	ILLUMINATE HOISTWAY LIGHTING
SYSTEM INPUTS – INITIATION	MANUAL FIRE BOX OPERATION	●		●	●					●				●	●	●			●		●	●	●	●						
	SMOKE DETECTOR OPERATION	●		●	●					●				●	●	●			●		●	●	●	●						
	HEAT DETECTOR OPERATION	●		●	●					●				●	●	●			●		●	●	●	●						
	CARBON MONOXIDE DETECTOR OPERATION		●							●				●	●	●			●		●	●	●	●						
	DUCT DETECTOR OPERATION	●		●	●					●				●	●	●			●		●	●	●	●		●	●	●		
	AUTOMATIC SPRINKLER SYSTEM WATER FLOW OPERATION	●		●	●					●				●	●	●			●		●	●	●	●						
	SMOKE DETECTION IN ELEVATOR LOBBY – DESIGNATED RECALL LEVEL	●		●	●					●			●	●	●	●			●		●	●	●	●						●
	SMOKE DETECTION IN ELEVATOR LOBBY – ALL OTHER LEVELS	●		●	●					●			●	●	●	●			●		●	●	●	●					●	●
	SMOKE DETECTION IN ELEVATOR HOISTWAY	●		●	●					●	●	●	●	●	●	●			●		●	●	●	●					●	
	WATERFLOW IN ELEVATOR HOISTWAY	●		●	●					●	●		●	●	●	●			●		●	●	●	●					●	
	SMOKE OR HEAT DETECTION IN ELEVATOR MACHINE ROOM	●		●	●					●	●	●	●	●	●	●			●		●	●	●	●					●	
SYSTEM INPUTS – EXTERNAL SYSTEM INPUT	ALARM SIGNAL FROM SUPPRESSION SYSTEM	●		●	●					●				●	●	●			●	●	●	●	●	●						
	SUPERVISORY SIGNAL FROM SUPPRESSION SYSTEM					●	●										●			●										
	TROUBLE SIGNAL FROM SUPPRESSION SYSTEM							●	●									●		●										
	SMOKE DETECTION IN AREA SERVED BY SUPPRESSION SYSTEM	●		●	●					●				●	●	●			●		●	●	●	●	●					
	FIRE EXTINGUISHING SYSTEM OPERATION	●		●	●					●				●	●	●			●		●	●	●	●						
	FIRE STANDPIPE SYSTEM OPERATION	●		●	●					●				●	●	●			●		●	●	●	●						
	FIRE PROTECTION SYSTEM VALVE TAMPER OPERATION					●	●										●			●										
STATUS	OPEN CIRCUIT, SHORT CIRCUIT, OR GROUND FAULT ON INITIATING DEVICE, SIGNALING LINE, OR NOTIFICATION APPLIANCE CIRCUIT.						●	●										●		●	●									
	OPENING, TAMPERING, OR REMOVAL OF ALARM-INITIATING DEVICES						●	●										●		●	●									
	OPENING, TAMPERING, OR REMOVAL OF SUPERVISORY SIGNAL INITIATING DEVICES						●	●										●		●	●									
	LOSS OF PRIMARY POWER OF FACP						●	●										●		●	●									
	GROUND OR SIGNAL BREAK IN FACP INTERNAL CIRCUITS						●	●										●		●	●									
	ABNORMAL AC VOLTAGE AT THE FACP						●	●										●		●	●									
	STANDBY BATTERY CIRCUITRY BREAK						●	●										●		●	●									
	FAILURE OF BATTERY CHARGING SYSTEM						●	●										●		●	●									
	ABNORMAL POSITION OF ANY SWITCH AT THE FACP						●	●										●		●	●									
	ABNORMAL POSITION OF ANY SWITCH AT THE ANNUNCIATOR						●	●										●		●	●									
	GENERATOR FAULT						●	●										●		●	●									
	GENERATOR SWITCH IN NON AUTOMATIC POSITION						●	●										●		●	●									
	GENERATOR RUNNING					●	●										●				●									
	KNOX BOX OPEN					●	●										●				●									

FIRE ALARM MATRIX

NO SCALE



DUCT TYPE DETECTOR INSTALLATION

NO SCALE

NOTES:

1. PROVIDE SAMPLING TUBE LENGTH AS REQUIRED FOR WIDTH OF DUCT.

TMP ARCHITECTURE

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

ELECTRICAL DETAILS AND DIAGRAMS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

DRAWN	DDS
CHECKED	ZDB
APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

E7.5

g:\2023\2023-0154-00\CAD\2023-0154-E7-DT.dwg, E7.5, 6/17/2024 10:59:59 AM, Rachel L. Wilson, None ,0.09448, Peter Basso Associates Inc.

LUMINAIRE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER(S)	WATTAGE	VOLTAGE	LIGHT CHARACTERISTICS	CONTROLS	REMARKS
L32	8"x48" VANDAL RESISTANT SURFACE MOUNT FIXTURE: DIE CAST ALUMINUM HOUSING, UV STABILIZED IMPACT RESISTANT POLYCARBONATE LENS FULLY GASKETED WITH ALLEN PIN FASTENERS. FIXTURE SHALL BE WHITE. NOTE: PROVIDE (3) ALLEN PIN SCREW DRIVERS AND TURN OVER TO OWNER.	1. KENALL MLHA SERIES 2. FAIL SAFE HVL SERIES 3. NEW STAR VICTORY SERIES	45	MULTI	LED 4000K 80CRI 5,000 LUMENS		FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L33	2'X4' BACK ILLUMINATED RECESSED SKY IMAGE CEILING LIGHT FIXTURE: ALUMINUM FRAME AND ACRYLIC LENS WITH MATTE FINISH. HIGH RESOLUTION DIGITAL IMAGE WITH FADE RESISTANT PIGMENTS WITH UV INHIBITORS.	1. SKY FACTORY EP24-CLA SERIES	47	MULTI	LED 6500K	0-10V TO 10% DIMMING	
L34	CORNER MOUNT TAPE LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING, FULL FROSTED LENS. WHITE FINISH. PROVIDE LENGTHS AS INDICATED ON PLANS.	1. KLUS KUBIK-45 SERIES 2. CALI ALS50TO-C SERIES 3. JESCO CH-SM-24 SERIES	1.5 PER FOOT	MULTI	LED 4000K 90CRI 115 LUMENS PER FOOT		
EXIT SIGN	WHITE DIE CAST ALUMINUM FACE, RED LETTERS, HIGH OUTPUT LED DIFFUSE LIGHT PANEL. SINGLE OR DOUBLE STENCIL WITH DIRECTIONAL ARROWS AS INDICATED ON PLAN. PROVIDE MOUNTING AS INDICATED ON PLAN.	1. LITHONIA SIGNATURE SERIES 2. DUAL-LITE SEMPRA SERIES 3. SURELITE CX SERIES	2	MULTI	HIGH OUTPUT LED LIGHT PANEL		
OL1	LED ARCHITECTURAL WALL PACK FIXTURE: TYPE IV FORWARD THROW DISTRIBUTION, WEATHER RESISTANT ALUMINUM HOUSING, IP65 RATED. COLOR SHALL BE BRONZE.	1. LITHONIA WST SERIES 2. MCGRAW EDISON IST SERIES 3. SPAULDING TRP SERIES	25	MULTI	LED 4000K 70CRI 3,000 LUMENS		FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
OL2	4" WIDE RECESSED LINEAR LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING. UL WET LOCATION LISTED AND IP65 RATED. WHITE POWDERCOAT FINISH WITH IMPACT RESISTANT ACRYLIC LENS.	1. FINELITE HP4-WL SERIES 2. AXIS WET BEAM 4 SERIES 3. NULITE RXT-F SERIES	3.2 PER FOOT	MULTI	LED 4000K 80CRI 350 LUMENS PER FOOT		FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
SL1	POLE MOUNTED SITE LIGHT FIXTURE: POLE TOP CONFIGURATION AS INDICATED ON PLAN. TYPE (4) DISTRIBUTION. FULLY GASKETED ALUMINUM HOUSING WITH INTEGRAL WEATHER TIGHT DRIVER. UL WET LOCATION LISTED AND IP65 RATED. FUSED AT HANDHOLE. FIXTURE SHALL BE DARK BRONZE. 25' TALL 4" SQUARE ALUMINUM POLE PROVIDE MOUNTING BRACKETS FOR CONFIGURATION INDICATED ON PLAN, POWDER COAT FINISH WITH BOLT COVER AND HAND HOLE. FINISH TO MATCH FIXTURE.	1. LITHONIA D SERIES 2. COOPER GALLEON 2 SERIES 3. EXO SLING MICROSTRIKE SERIES	165	MULTI	LED 4000K 20,800 LUMENS	INTEGRAL MOTION SENSOR	FIXTURE SHALL DIM TO 50% WHEN NO MOTION IS DETECTED FOR 15 MINUTES
SL2	POLE MOUNTED SITE LIGHT FIXTURE: POLE TOP CONFIGURATION AS INDICATED ON PLAN. TYPE (2) DISTRIBUTION. FULLY GASKETED ALUMINUM HOUSING WITH INTEGRAL WEATHER TIGHT DRIVER. UL WET LOCATION LISTED AND IP65 RATED. FUSED AT HANDHOLE. FIXTURE SHALL BE DARK BRONZE. 25' TALL 4" SQUARE ALUMINUM POLE PROVIDE MOUNTING BRACKETS FOR CONFIGURATION INDICATED ON PLAN, POWDER COAT FINISH WITH BOLT COVER AND HAND HOLE. FINISH TO MATCH FIXTURE.	1. LITHONIA D SERIES 2. COOPER GALLEON 2 SERIES 3. EXO SLING MICROSTRIKE SERIES	165	MULTI	LED 4000K 20,300 LUMENS	INTEGRAL MOTION SENSOR	FIXTURE SHALL DIM TO 50% WHEN NO MOTION IS DETECTED FOR 15 MINUTES
SL3	POLE MOUNTED SITE LIGHT FIXTURE: POLE TOP CONFIGURATION AS INDICATED ON PLAN. TYPE (3) DISTRIBUTION. FULLY GASKETED ALUMINUM HOUSING WITH INTEGRAL WEATHER TIGHT DRIVER. UL WET LOCATION LISTED AND IP65 RATED. FUSED AT HANDHOLE. FIXTURE SHALL BE DARK BRONZE. 15' TALL 4" SQUARE ALUMINUM POLE PROVIDE MOUNTING BRACKETS FOR CONFIGURATION INDICATED ON PLAN, POWDER COAT FINISH WITH BOLT COVER AND HAND HOLE. FINISH TO MATCH FIXTURE.	1. LITHONIA D SERIES 2. COOPER GALLEON 2 SERIES 3. EXO SLING MICROSTRIKE SERIES	51	MULTI	LED 4000K 7,500 LUMENS	INTEGRAL MOTION SENSOR	FIXTURE SHALL DIM TO 50% WHEN NO MOTION IS DETECTED FOR 15 MINUTES

GENERAL NOTES:

1. FIRST LISTED MANUFACTURER IS BASIS OF DESIGN.
2. WATTAGE LISTED IS FROM THE BASIS OF DESIGN MANUFACTURER.
3. FINISH TO BE APPROVED BY INTERIOR DESIGNER, AND/OR ARCHITECT.
4. ALL LUMINAIRES TO BE AS SPECIFIED OR EQUAL APPROVED BY PBA.

LUMINAIRE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER(S)	WATTAGE	VOLTAGE	LIGHT CHARACTERISTICS	CONTROLS	REMARKS
L1	2'X4' RECESSED ARCHITECTURAL CENTER BASKET LIGHT FIXTURE: STEEL HOUSING WITH POLYESTER POWDER COAT MATTE WHITE FINISH, ROUND ACRYLIC DIFFUSER.	1. LITHONIA BLT SERIES 2. METALUX CRUZE SERIES 3. COLUMBIA LCAT SERIES	39.3	MULTI	LED 4000K 80CRI 4,800 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L2	2'X4' RECESSED ARCHITECTURAL CENTER BASKET LIGHT FIXTURE: STEEL HOUSING WITH POLYESTER POWDER COAT MATTE WHITE FINISH, ROUND ACRYLIC DIFFUSER.	1. LITHONIA BLT SERIES 2. METALUX CRUZE SERIES 3. COLUMBIA LCAT SERIES	30.5	MULTI	LED 4000K 80CRI 4,000 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L3	2'X4' RECESSED ARCHITECTURAL CENTER BASKET LIGHT FIXTURE: STEEL HOUSING WITH POLYESTER POWDER COAT MATTE WHITE FINISH, ROUND ACRYLIC DIFFUSER.	1. LITHONIA BLT SERIES 2. METALUX CRUZE SERIES 3. COLUMBIA LCAT SERIES	22.5	MULTI	LED 4000K 80CRI 3,000 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L4	2'X4' RECESSED FLAT PANEL LIGHT FIXTURE: ALUMINUM BEZEL, STEEL BACKING AND WHITE FROST ACRYLIC DIFFUSER.	1. LITHONIA CPX SERIES 2. METALUX CGTX SERIES 3. COLUMBIA CBT SERIES	36.7	MULTI	LED 4000K 80CRI 4,000 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L5	2'X4' RECESSED FLAT PANEL LIGHT FIXTURE: ALUMINUM BEZEL, STEEL BACKING AND WHITE FROST ACRYLIC DIFFUSER.	1. LITHONIA CPX SERIES 2. METALUX CGTX SERIES 3. COLUMBIA CBT SERIES	24.6	MULTI	LED 4000K 80CRI 3,000 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L6	2'x4' VANDAL RESISTANT RECESSED LIGHT FIXTURE: FULLY GASKETED STEEL HOUSING AND DOOR WITH ALLEN PIN FASTENERS AND A12.125 UV STABILIZED POLYCARBONATE LENS. FIXTURE SHALL BE WHITE. NOTE: PROVIDE (3) ALLEN PIN SCREW DRIVERS AND TURN OVER TO OWNER.	1. KENALL RMCA SERIES 2. KUTZON VL SERIES 3. NEW STAR 57R SERIES	67	MULTI	LED 4000K 80CRI 7,000 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L7	2'x4' VANDAL RESISTANT RECESSED LIGHT FIXTURE: FULLY GASKETED STEEL HOUSING AND DOOR WITH ALLEN PIN FASTENERS AND A12.125 UV STABILIZED POLYCARBONATE LENS. FIXTURE SHALL BE WHITE. NOTE: PROVIDE (3) ALLEN PIN SCREW DRIVERS AND TURN OVER TO OWNER.	1. KENALL RMCA SERIES 2. KUTZON VL SERIES 3. NEW STAR 57R SERIES	45	MULTI	LED 4000K 80CRI 4,600 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L8	2'X2' RECESSED FLAT PANEL LIGHT FIXTURE: ALUMINUM BEZEL, STEEL BACKING AND WHITE FROST ACRYLIC DIFFUSER.	1. LITHONIA CPX SERIES 2. METALUX CGTX SERIES 3. COLUMBIA CBT SERIES	36.3	MULTI	LED 4000K 80CRI 4,000 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L9	2'X2' RECESSED FLAT PANEL LIGHT FIXTURE: ALUMINUM BEZEL, STEEL BACKING AND WHITE FROST ACRYLIC DIFFUSER.	1. LITHONIA CPX SERIES 2. METALUX CGTX SERIES 3. COLUMBIA CBT SERIES	30.1	MULTI	LED 4000K 80CRI 3,200 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L10	2'X2' RECESSED FLAT PANEL LIGHT FIXTURE: ALUMINUM BEZEL, STEEL BACKING AND WHITE FROST ACRYLIC DIFFUSER.	1. LITHONIA CPX SERIES 2. METALUX CGTX SERIES 3. COLUMBIA CBT SERIES	15.6	MULTI	LED 4000K 80CRI 2,000 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L11	4" WIDE RECESSED WALL WASH CONTINUOUS ROW LINEAR LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING AND DIE CAST END CAPS WITH FROSTED ACRYLIC LENS. FIXTURE SHALL BE WHITE. FIXTURE LENGTHS AS INDICATED ON PLAN.	1. FINELITE HP4 SERIES 2. AXIS BEAM 4 SERIES 3. NULITE REGOLO SERIES	9.3 PER FOOT	MULTI	LED 4000K 80CRI 400 LUMENS PER FOOT	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L12	4" WIDE RECESSED CONTINUOUS ROW LINEAR LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING AND DIE CAST END CAPS WITH FROSTED ACRYLIC LENS. FIXTURE SHALL BE WHITE. FIXTURE LENGTHS AS INDICATED ON PLAN.	1. FINELITE HP4 SERIES 2. AXIS BEAM 4 SERIES 3. NULITE REGOLO SERIES	7.1 PER FOOT	MULTI	LED 4000K 80CRI 700 LUMENS PER FOOT	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L13	4" WIDE RECESSED CONTINUOUS ROW LINEAR LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING AND DIE CAST END CAPS WITH FROSTED ACRYLIC LENS. FIXTURE SHALL BE WHITE. FIXTURE LENGTHS AS INDICATED ON PLAN.	1. FINELITE HP4 SERIES 2. AXIS BEAM 4 SERIES 3. NULITE REGOLO SERIES	4.7 PER FOOT	MULTI	LED 4000K 80CRI 500 LUMENS PER FOOT	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L14	2" WIDE SURFACE MOUNT CONTINUOUS ROW LINEAR LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING AND DIE CAST END CAPS WITH FROSTED ACRYLIC DROP LENS DIFFUSER. FIXTURE SHALL BE WHITE. FIXTURE LENGTHS AS INDICATED ON PLAN.	1. LUMENWERX QUAD NARROW SERIES 2. AXIS MINI BOX SERIES 3. NULITE PIXIE SERIES	3.8 PER FOOT	MULTI	LED 4000K 80CRI 550 LUMENS PER FOOT	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR)
L15	4" WIDE AIR CRAFT CABLE MOUNT CONTINUOUS ROW LINEAR LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING AND DIE CAST END CAPS, WITH FROSTED ACRYLIC DIFFUSER AND DIRECT/INDIRECT DISTRIBUTION. FIXTURE SHALL BE WHITE. FIXTURE LENGTHS AS INDICATED ON PLAN.	1. FINELITE HP4 SERIES 2. AXIS BEAM 4 SERIES 3. NULITE REGOLO SERIES	10.7 PER FOOT	MULTI	LED 4000K 80CRI 430 LUMENS PER FOOT INDIRECT 720 LUMENS PER FOOT DIRECT	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L16	4" WIDE AIR CRAFT CABLE MOUNT CONTINUOUS ROW LINEAR LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING AND DIE CAST END CAPS, WITH FROSTED ACRYLIC DIFFUSER AND DIRECT/INDIRECT DISTRIBUTION. FIXTURE SHALL BE WHITE. FIXTURE LENGTHS AS INDICATED ON PLAN.	1. FINELITE HP4 SERIES 2. AXIS BEAM 4 SERIES 3. NULITE REGOLO SERIES	8.2 PER FOOT	MULTI	LED 4000K 80CRI 430 LUMENS PER FOOT INDIRECT 430 LUMENS PER FOOT DIRECT	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L17	4" WIDE AIR CRAFT CABLE MOUNT CONTINUOUS ROW LINEAR LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING AND DIE CAST END CAPS, WITH FROSTED ACRYLIC DIFFUSER AND DIRECT/INDIRECT DISTRIBUTION. FIXTURE SHALL BE WHITE. FIXTURE LENGTHS AS INDICATED ON PLAN.	1. FINELITE HP4 SERIES 2. AXIS BEAM 4 SERIES 3. NULITE REGOLO SERIES	7.3 PER FOOT	MULTI	LED 4000K 80CRI 430 LUMENS PER FOOT INDIRECT 380 LUMENS PER FOOT DIRECT	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L18	2" WIDE AIR CRAFT CABLE MOUNT "Y" PATTERN LINEAR LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING AND DIE CAST END CAPS, WITH FROSTED ACRYLIC DIFFUSER AND DIRECT/INDIRECT DISTRIBUTION. FIXTURE SHALL BE WHITE. FIXTURE LENGTHS AS INDICATED ON PLAN.	1. FINELITE HP4 SERIES 2. AXIS BEAM 4 SERIES 3. NULITE REGOLO SERIES	7.1 PER FOOT	MULTI	LED 4000K 80CRI 390 LUMENS PER FOOT INDIRECT 320 LUMENS PER FOOT DIRECT	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L19	8"x96" VANDAL RESISTANT SURFACE MOUNT FIXTURE: DIE CAST ALUMINUM HOUSING, UV STABILIZED IMPACT RESISTANT POLYCARBONATE LENS FULLY GASKETED WITH ALLEN PIN FASTENERS. FIXTURE SHALL BE WHITE. NOTE: PROVIDE (3) ALLEN PIN SCREW DRIVERS AND TURN OVER TO OWNER.	1. KENALL MLHA SERIES 2. FAIL SAFE HVL SERIES 3. NEW STAR VICTORY SERIES	90	MULTI	LED 4000K 80CRI 10,000 LUMENS		FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L20	4' CHAIN HUNG STRIP LIGHT FIXTURE: STEEL HOUSING PAINTED AFTER FABRICATION. FROSTED LENS WITH WIRE GUARD. FIXTURE SHALL BE WHITE	1. LITHONIA CLX SERIES 2. METALUX FP SERIES 3. COLUBIA LCL SERIES	44.5	MULTI	LED 4000K 80CRI 7,000 LUMENS		FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L21	4' CHAIN HUNG STRIP LIGHT FIXTURE: STEEL HOUSING PAINTED AFTER FABRICATION. FROSTED LENS WITH WIRE GUARD. FIXTURE SHALL BE WHITE	1. LITHONIA CLX SERIES 2. METALUX FP SERIES 3. COLUBIA LCL SERIES	31.8	MULTI	LED 4000K 80CRI 5,000 LUMENS		FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L22	4' CHAIN HUNG STRIP LIGHT FIXTURE: STEEL HOUSING PAINTED AFTER FABRICATION. FROSTED LENS WITH WIRE GUARD. FIXTURE SHALL BE WHITE	1. LITHONIA CLX SERIES 2. METALUX FP SERIES 3. COLUBIA LCL SERIES	19.1	MULTI	LED 4000K 80CRI 3,000 LUMENS		FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L23	2x4 HIGH BAY LIGHT FIXTURE: 22 GUAGE WHITE POWDER COAT STEEL HOUSING PAINTED AFTER FABRICATION. 20 GAUGE WELDED WHITE STEEL DOOR FRAME WITH HEAVY DUTY WIRE GUARD WELDED TO DOOR FRAME WITH CLEAR POLYCARBONATE LENS. DOOR FRAME PIANO HINGED AND SECURED TO HOUSING WITH CLASPS AND LOCKING SCREW. AIRCRAFT "Y" CABLE MOUNTED WITH SAFETY CHAIN.	1. SOLAS RAY HB6 SERIES 2. VISIONEERING LHBX SERIES 3. BEGHELLI ACCIAIO 940 SERIES	200	MULTI	LED 4000K 80CRI 27,000 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L24	6" DIA CYLINDER PENDANT CORD MOUNT DOWNLIGHT FIXTURE: EXTRUDED ALUMINUM BODY AND INTEGRAL DRIVER. CLEAR TRIM AND SEMI -SPECULAR REFLECTOR WIDE DISTRIBUTION. FINISH BY ARCHITECT.	1. GOTHAM EVO6CC SERIES 2. PORTFOLIO LER6D SERIES 3. PRESCOLITE LTC-6RDW	14.7	MULTI	LED 4000K 80CRI 1,500 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L25	6" DIA CYLINDER PENDANT CORD MOUNT DOWNLIGHT FIXTURE: EXTRUDED ALUMINUM BODY AND INTEGRAL DRIVER. CLEAR TRIM AND SEMI -SPECULAR REFLECTOR WIDE DISTRIBUTION. FINISH BY ARCHITECT.	1. GOTHAM EVO6CC SERIES 2. PORTFOLIO LER6D SERIES 3. PRESCOLITE LTC-6RDW	7.9	MULTI	LED 4000K 80CRI 750 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L26	6" DIAMETER DOWNLIGHT LIGHT FIXTURE: VENTILATED DIE CAST ALUMINUM HEAT SINK, DIE CAST ALUMINUM BEZEL, TAMPER RESISTANT TORX SCREWS, FULLY SEALED, SELF FLANGED WHITE TRIM RING AND CLEAR POLYCARBONATE LENS. IP65 RATED.	1. GOTHAM EVO VR SERIES 2. FAIL-SAFE FLD6C SERIES 3.	11.7	MULTI	LED 4000K 80CRI 1,000 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L27	6" DIAMETER DOWNLIGHT LIGHT FIXTURE: VENTILATED DIE CAST ALUMINUM HEAT SINK, SELF FLANGED WHITE TRIM RING WITH SEMI-SPECULAR REFLECTOR, DIFFUSED LENS WIDE DISTRIBUTION.	1. GOTHAM EVO SERIES 2. PORTFOLIO LD6C SERIES 3. PRESOLITE LFR-6RD SERIES	11.7	MULTI	LED 4000K 80CRI 1,000 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L28	42" DIAMETER AIR CRAFT CABLE MOUNT ACOUSTICAL LIGHT FIXTURE: WIDE FLOOD OPTICS, SOLA FELT MATERIAL. FINISH BY ARCHITECT.	1. LIGHT ART ACOUSTIC COLLECTION EMPIRE SHADE		MULTI	LED 4000K 80CRI 2,600 LUMENS	0-10V TO 10% DIMMING	
L29	8" DIAMETER ILLUMINATED AIR CRAFT CABLE MOUNTED CYLINDER WITH DOWN LIGHT, LIGHT FIXTURE: FIXTURE HEIGHT 41" MAX, WIDE BEAM SPREAD DOWNLIGHT. INTEGRAL DRIVER WITH ALUMINUM HOUSING. FINISH BY ARCHITECT.	1. OCL TUBIE SERIES 2. GLIGHTING SIDNEY 8 SERIES 3. CAMMAN P4100 SERIES		MULTI	LED 4000K 80CRI 3,000 LUMENS BODY 1,100 LUMENS DOWNLIGHT	0-10V TO 10% DIMMING	
L30	4" WIDE AIR CRAFT CABLE MOUNT CONTINUOUS ROW LINEAR LIGHT FIXTURE: EXTRUDED ALUMINUM HOUSING AND DIE CAST END CAPS, WITH FROSTED ACRYLIC DIFFUSER AND DIRECT/INDIRECT DISTRIBUTION. FIXTURE SHALL BE WHITE. FIXTURE LENGTHS AS INDICATED ON PLAN.	1. FINELITE HP4 SERIES 2. AXIS BEAM 4 SERIES 3. NULITE REGOLO SERIES	7.3 PER FOOT	MULTI	LED 4000K 80CRI 430 LUMENS PER FOOT INDIRECT 970 LUMENS PER FOOT DIRECT	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).
L31	2" DIAMETER RECESSED STEP LIGHT FIXTURE: MACHINED ALUMINUM HOUSING WITH TEMPERED GLASS LENS. FINISH BY ARCHITECT.	1. MP LJ07 SERIES 2. MINIM PLOOK SERIES 3. ZANIBONI MINI TDW SERIES	2	MULTI	LED 4000K 80CRI 220 LUMENS	0-10V TO 10% DIMMING	FOR FIXTURES INDICATED AS EMERGENCY ON PLAN PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR).

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

ELECTRICAL DETAILS AND DIAGRAMS

ISSUE DATES

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DRAWN	DDS
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APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

E7.6

g:\2023\2023-0154-00\CAD\2023-0154-E7-DT.dwg, E7.6, 6/17/2024 11:58:10 AM, Rachel L. Wilson, None ,0.09448, Peter Basso Associates Inc.

INTERIOR LIGHTING CONTROL SCHEDULE

PLAN REFERENCE	ROOM TYPE	LOCAL CONTROL		CONTROL ON / OFF	SENSOR TYPE	TURN ON LIGHTING TO %	BI-LEVEL CONTROL	DAYLIGHT			NO DETECTION FULL OFF (MIN)	EMERGENCY LIGHTING CIRCUIT CONTROL	HVAC CONTROL	NOTES
		SWTCH TYPE	SWTCH CONTROL					SIDE LIGHT	TOP LIGHT	MAINTAIN FC LEVEL				
A	CLASSROOM/LECTURE HALL/TRAINING ROOM (ALL OTHER CLASSROOMS/LECTURE HALLS/TRAINING ROOMS)	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	YES	N/A	EQUAL TO LIGHT OUTPUT OF FIXTURE OUTSIDE OF DAYLIGHTING AREA	20	ALCR		
B	CLASSROOM/LECTURE HALL/TRAINING ROOM (ALL OTHER CLASSROOMS/LECTURE HALLS/TRAINING ROOMS)	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	N/A	N/A		20	ALCR		
C	CONFERENCE/MEETING/MULTIPURPOSE ROOM	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	N/A	N/A		20	ALCR		
D	CORRIDOR (ALL OTHER CORRIDORS)	LINE VOLTAGE	ON-OFF	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	N/A	N/A	YES	EQUAL TO LIGHT OUTPUT OF FIXTURE OUTSIDE OF DAYLIGHTING AREA	20	ALCR		
E	CORRIDOR (ALL OTHER CORRIDORS)	LINE VOLTAGE	ON-OFF	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	N/A	N/A	N/A		20	ALCR		
F	DINING AREA (ALL OTHER DINING AREAS)	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	YES	N/A	EQUAL TO LIGHT OUTPUT OF FIXTURE OUTSIDE OF DAYLIGHTING AREA	20	ALCR		
G	ELECTRICAL/MECHANICAL ROOM	LINE VOLTAGE	ON-OFF	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	N/A	N/A	N/A		N/A	ALCR		
H	FOOD PREPARATION AREA	LOW VOLTAGE	ON-OFF-DIM	MANUAL ON / MANUAL OFF	N/A	FULL 100%	CONTINUOUS DIM	N/A	N/A		N/A	ALCR		
I	GYMNASIUM/FITNESS CENTER (IN A PLAYING AREA)	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	N/A	N/A		20	ALCR		PROVIDE WIRE GUARDS FOR ALL LIGHTING CONTROL DEVICES IN SPACE
J	LIBRARY (IN A READING AREA)	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	YES	N/A	EQUAL TO LIGHT OUTPUT OF FIXTURE OUTSIDE OF DAYLIGHTING AREA	20	ALCR		
K	LOCKER ROOM	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	N/A	N/A		20	ALCR		PROVIDE WIRE GUARDS FOR ALL LIGHTING CONTROL DEVICES IN SPACE
L	LOUNGE/BREAKROOM (ALL OTHER LOUNGES/BREAKROOMS)	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	N/A	N/A		20	ALCR		
M	OFFICE (ENCLOSED AND ≤ 250 SQFT)	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	YES	N/A	EQUAL TO LIGHT OUTPUT OF FIXTURE OUTSIDE OF DAYLIGHTING AREA	20	ALCR		
N	OFFICE (ENCLOSED AND ≤ 250 SQFT)	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	N/A	N/A		20	ALCR		
O	RESTROOM (ALL OTHER RESTROOMS)	LINE VOLTAGE	ON-OFF	SENSOR ON / SENSOR OFF	ULTRASONIC	FULL 100%	N/A	N/A	N/A		20	ALCR		
P	STORAGE ROOM (≥50 FT2 AND ≤ 1000 SQFT)	LINE VOLTAGE	ON-OFF	MANUAL ON / SENSOR OFF	ULTRASONIC	FULL 100%	N/A	N/A	N/A		20	N/A		
Q	STAIRWAY	LINE VOLTAGE	ON-OFF	SENSOR ON / SENSOR OFF	ULTRASONIC	FULL 100%	N/A	N/A	N/A		20	N/A		
R	WORKSHOP	LOW VOLTAGE	ON-OFF-DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	PARTIAL 50%	CONTINUOUS DIM	N/A	N/A		20	ALCR		

N/A = NOT APPLICABLE

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

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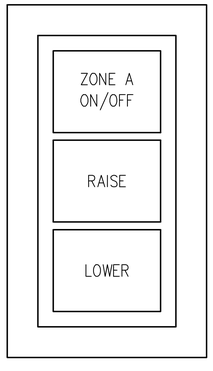
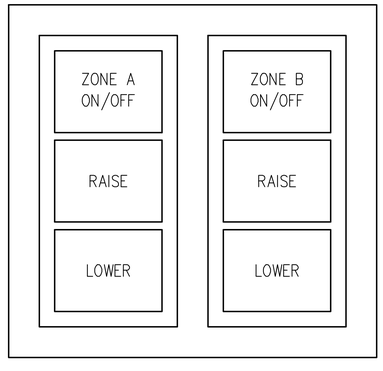


LC **TYPICAL DIMMING LIGHTING CONTROL STATION**

NO SCALE

NOTES:
1. FOR LIGHTING CONTROL DEVICES IN REMOTE LOCATIONS DEVICES SHALL HAVE PILOT LIGHT AND LABELING FOR FIXTURES BEING CONTROLLED.



LC a,b **TYPICAL ZONED DIMMING LIGHTING CONTROL STATION**

NO SCALE

NOTES:
1. FOR LIGHTING CONTROL DEVICES IN REMOTE LOCATIONS DEVICES SHALL HAVE PILOT LIGHT AND LABELING FOR FIXTURES BEING CONTROLLED.

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PBA Project No.: 2023.0154

PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

ELECTRICAL DETAILS AND DIAGRAMS

ISSUE DATES

DATE:	ISSUED FOR:
06-18-2024	CONSTRUCTION DOCUMENTS

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APPROVED	STP

PROJECT NO.

22102

DRAWING NO.

E7.7

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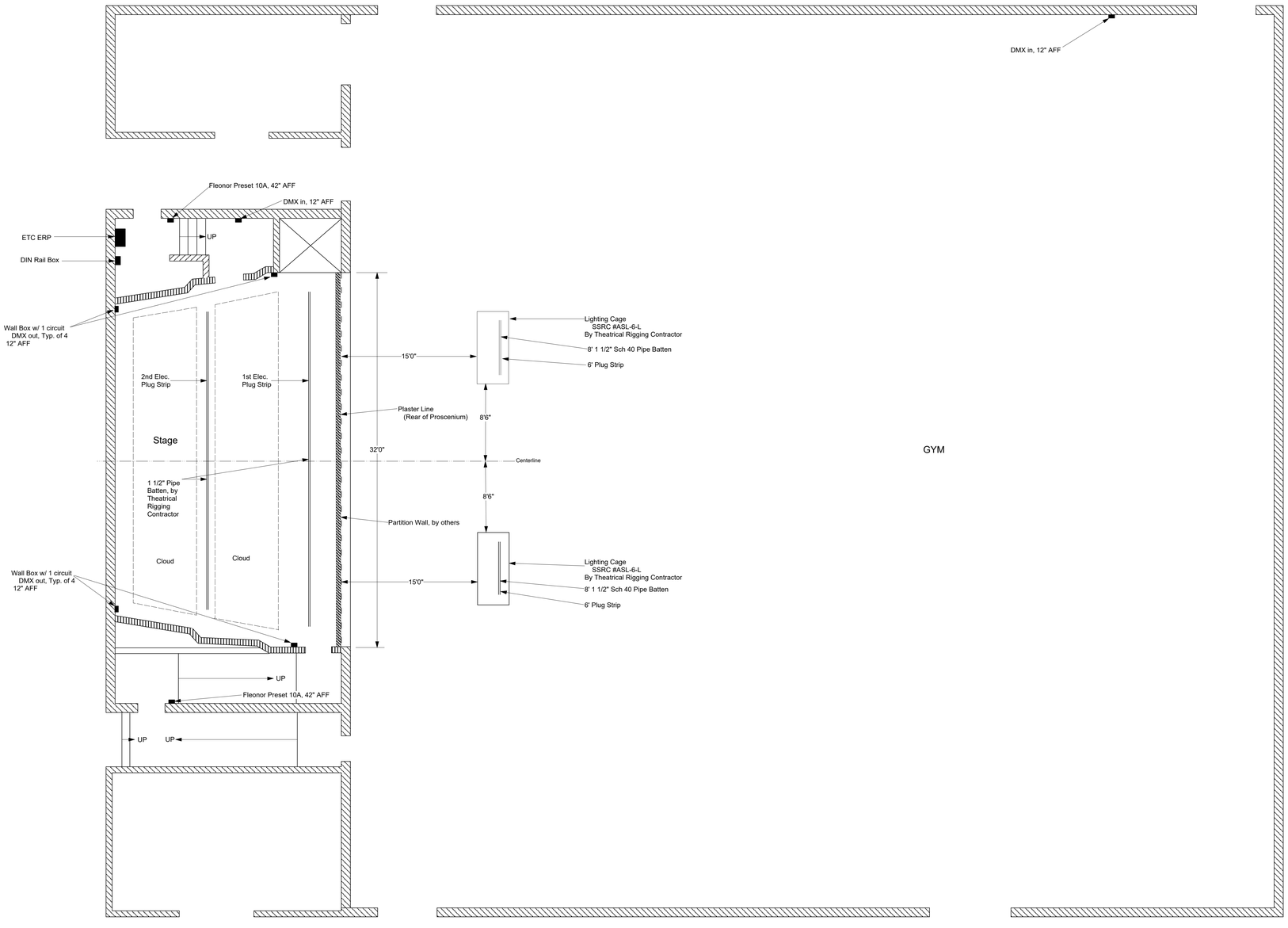

Theatrical Electrical Equipment Plan View

Scale: 3/16" = 1'0"

New Smith Middle School
Troy School District
Troy, Mi

TMP ARCHITECTURE

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PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

New Smith Middle School
Troy School District
Troy, Mi.
Theatrical Electrical
Location Plan View

ISSUE DATES

DATE:	ISSUED FOR:
06-18-24	CONSTRUCTION DOCUMENTS

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PROJECT NO.

22102

DRAWING NO.

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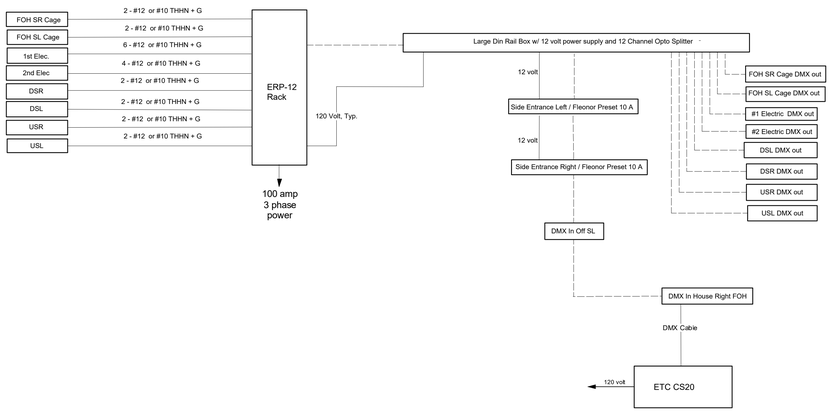


Theatrical Electrical Distribution and Control Riser Diagram

ERP Rack

Ter. #	Cir. #	Module	Location
1	1	20 a mp. Relay	FOH SR Cage
2	2		FOH SL Cage
3	3		1 st Electric
4	4		
5	5		
6	6		2 nd Electric
7	7		
8	8		DSR
9	9		DSL
10	10		USR
11	11		USL
12	12		spare future use
13	13	20 a mp. Breaker	DIN Box Power
14	14		As Nee ded
15	15		
16	16		
17	17		
18	18		

Relay / Breaker Schedule

- FOH - 1 / Relay #1
- FOH - 2 / Relay #2
- #1 Electric / Relay #3
- #1 Electric / Relay #4
- #1 Electric / Relay #5
- #2 Electric / Relay #6
- #2 Electric / Relay #7
- DSR / Relay #8
- DSL / Relay #9
- USR / Relay #10
- USL / Relay #11

Fixture Hang Position

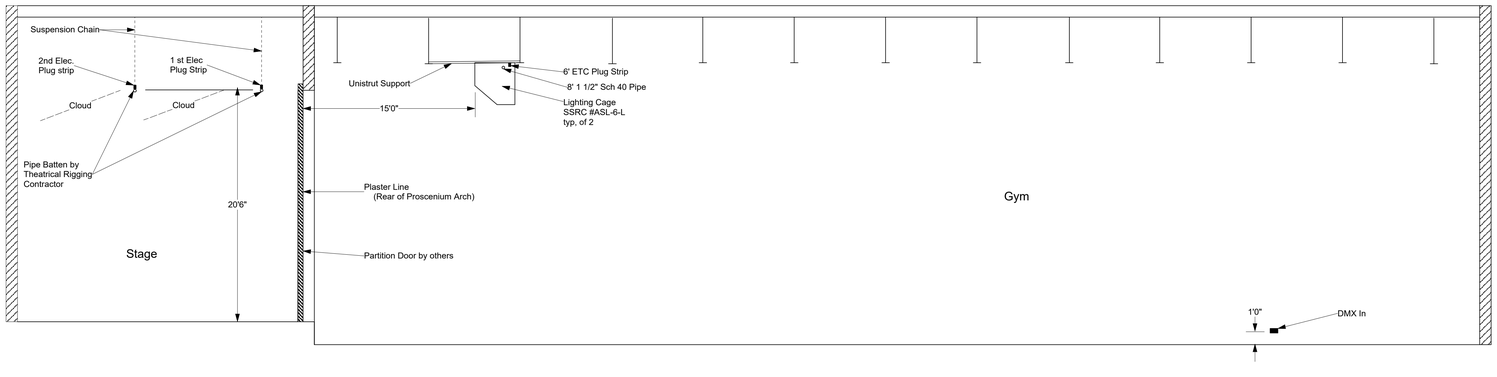
- FOH SR Cage / 6 - CSSPOTJr
- FOH SR Cage / 6 - CSSPOTJr
- 1 st Electric / 10 - CSPAR,
- 2 nd Electric / 4 - CSCYC
- Portable LED Followspot

Fixture Allocation

Fixture Count	
CSSPOTJr	-12
CSPAR Medium	- 10
CSCYC	- 4
Followspot	- 1

Wire Legend

- 1 - Belden #9729 or CAT 5
- #12 or #10 THHN 2 wire + G



Theatrical Electrical Equipment Section at Centerline

scale 3/16" = 1'0"

New Smith Middle School
Troy School District
Troy, Mi

TMP ARCHITECTURE

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PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

New Smith Middle School
Troy School District
Troy, Mi.
Theatrical Electrical Location Section at Centerline and Details

ISSUE DATES

DATE:	ISSUED FOR:
06-18-24	CONSTRUCTION DOCUMENTS

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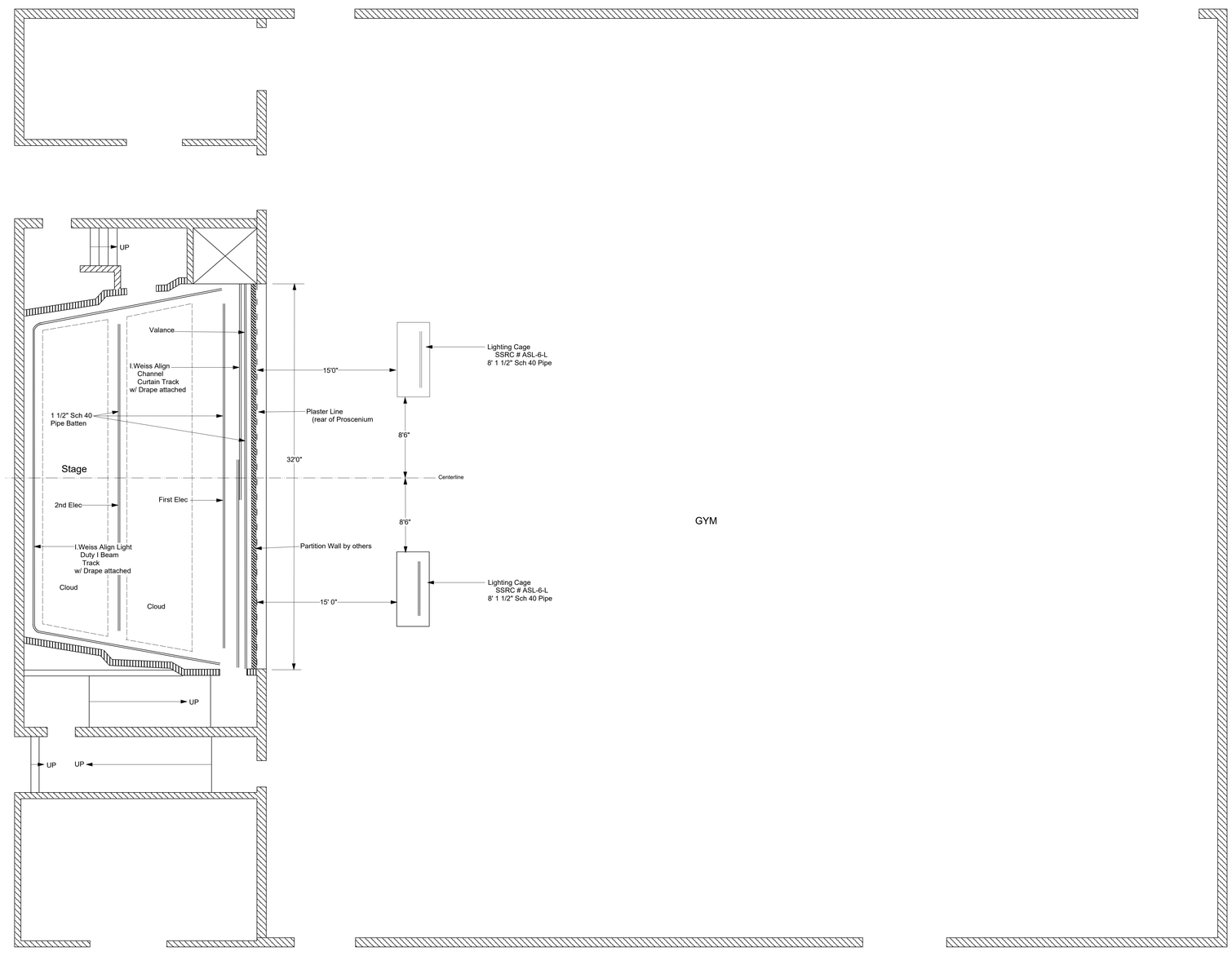
APPROVED

PROJECT NO.

22102

DRAWING NO.

TE1.2



Theatrical Rigging Plan View

Scale : 3/16" = 1'0"

New Smith Middle School
Troy School District
Troy, Mi

TMP ARCHITECTURE

TMP ARCHITECTURE INC

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PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

New Smith Middle School
Troy School District
Troy, Mi.
Theatrical Rigging
Plan View

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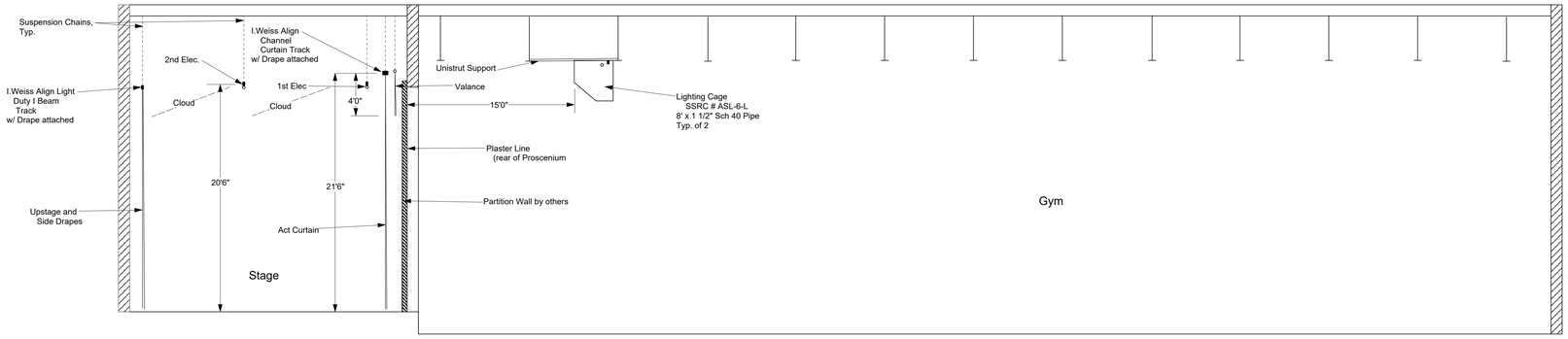
HANGING AND RIGGING PLOT

Distance from PL	Name	Pipe	Rigging Type	Hardware	Drapes
-15'0"	Lighting Cage		Dead Hung	2 - SSRC ASL-6-L	Mounted Roof Structure
1'2"	Valance	32' x 1 ½" Pipe	Dead Hung / Chain		1 pc 4' H x 32' W 25oz IFR Velour / 50% fullness
1'11"	Act Curtain		Dead Hund / Chain	36' ADC #282 Track	2 pcs 21' H x 17' W 25oz IFR Velour / 50% fullness
3'6"	1st Electric	28' x 1 ½" Pipe	Dead Hung / Chain	28' ETC ColorSource Raceway by E.C.	
14'8"	2nd Electric	24' X 1 ½" Pipe	Dead Hung / Chain	24' ETC ColorSource Raceway by E.C.	
	Side & Rear Legs		Dead Hung / Chain	60' ADC #142 Track	4 pcs 20' H x 15' W 20oz IFR Velour / 50% fullness



Theatrical Rigging Section View at Centerline

Scale : 3/16" = 1'0"

New Smith Middle School
Troy School District
Troy, Mi

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PROJECT TITLE

NEW SMITH MIDDLE SCHOOL

Bid Package No. 03B

Troy School District
Troy, Michigan

DRAWING TITLE

New Smith Middle School
Troy School District
Troy, Mi.
Theatrical Rigging Section View at Centerline and Details

ISSUE DATES

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