MACOMB COUNTY EXECUTIVE BOARD OF COMMISSIONERS

HVAC EQUIPMENT RENOVATIONS

ISSUED FOR: BIDS
DATE: MAY 12, 2025
PROJECT NO.: 242043

ARCHITECT:

WAKELY ASSOCIATES, INC./ ARCHITECTS
30500 VAN DYKE AVE, SUITE 209, WARREN, MI 48093, 586.573.4100

MECHANICAL & ELECTRICAL ENGINEER:

UNIFIED BUILDING SYSTEMS ENGINEERING, LLC
69 SOUTHBOUND GRATIOT AVE., MT. CLEMENS, MI 48043, 248.804.1741

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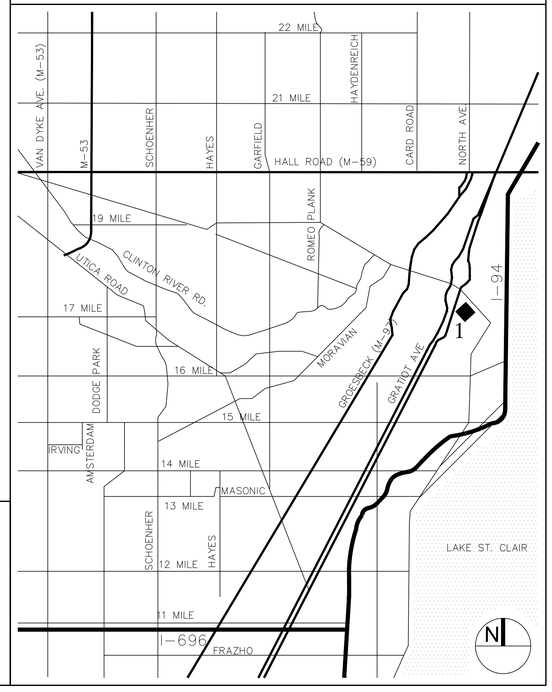
Building Addresses

1	TALMER BUILDING 120 N. MAIN ST. MT. CLEMENS, MI 48047

Location Map



ENGINEER SEAL:	ARCHITECT SEAL:

Macomb County Executive Board of Commissioners - Talmer Building
Issued for: Bids, Date - May 12, 2025, Project No.: 242043

ARCHITECTURAL ABBREVIATION LIST

ABBREVIATION	DESCRIPTION
A/C & VENT	AIR CONDITIONING & VENTILATION
A/E	ARCHITECT-ENGINEER
AB	ARCHITECT BOLT
ABRSV	ABRASIVE
ABRSV THRESH	ABRASIVE THRESHOLD
ACI	AMERICAN CONCRETE INSTITUTE
ACOUS INSUL	ACOUSTICAL INSULATION
ACOUS PNL	ACOUSTICAL PANEL
ACS DR	ACCESS DOOR
ACS PNL	ACCESS PANEL
ACST	ACOUSTIC
ACST SLNT	ACOUSTICAL SEALANT
ADA	AMERICANS W/ DISABILITIES ACT
ADDL	ADDITIONAL
ADDM	ADDENDUM
ADDN	ADDITION
ADJ	ADJACENT
ADJS	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AGGR	AGGREGATE
AHU	AIR HANDLING UNIT
ALT	ALTERATIONS
ALUM	ALUMINUM
ANES	ANESTHESIA, ANESTESIOLOGY
ANOD	ANODIZED
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APC	ACOUSTICAL PANAL CEILING
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASPH	ASPHALT
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS
ATC	ACOUSTICAL TILE CEILING
AUTO	AUTOMATIC
AVG	AVERAGE
B PL	BASE PLATE
B/B	BACK TO BACK
BC	BOTTOM CHORD
BD	BOARD
BEV	BEVELED
BF	BARRIER FREE
BF	BOTH FACES
BITUM	BITUMINOUS
BL	BUILDING LINE
BLDG	BUILDING
BLDG DAT	BUILDING DATUM
BLKG	BLOCKING
BLW	BELOW
BM	BEAM
BOS	BOTTOM OF STEEL
BOT	BOTTOM
BR	BEDROOM
BRKT	BRACKET
BRZ	BRONZE
BS	BOTH SIDES
BSMT	BASEMENT
BT	BENT
BTWN	BETWEEN
BULLN	BULLETIN
BUR	BUILT-UP ROOFING
C	CHANNEL
C TO C	CENTER TO CENTER
CA	COMPRESSED AIR
CAB	CABINET
CANTL	CANTILEVER
CATH	CATHETERIZE CATHETER
CB	CATCH BASIN
CEM	CEMENT
CER	CERAMIC
CF/CI	CONTRACTOR FURNISHED/ CONTRACTOR INSTALLED
CF/OI	CONTRACTOR FURNISHED/ OWNER INSALLED
CFMF	COLD-FORMED METAL FRAMING
CG	CORNER GUARD
CH	CORNER HOOK
CH BD	CHALK BOARD
CHKD	CHECKERED
CI	CAST IRON
CIR	CIRCLE CIRCULAR CIRCULATION
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLIN	CLINICAL
CLO	CLOSET
CLR	CLEAR
CMU	CONCRETE MASONARY UNIT
CNVR	CONVEYOR
CO	CLEANOUT
CO2	CARBON DIOXIDE
COL	COLUMN
COMO	COMPOSITION
CONC	CONCRETE
CONF	CONFERENCE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONSTR JT	CONSTRUCTION JOINT
CONT	CONTINUATION, CONTINUE, CONTINOUS
CONTR	CONTRACTOR
CORR	CORRIDOR
CPRS	COMPRESSIBLE, COMPRESSED
CPS	CARPET (SHEET)
CPI	CARPET (TILE)
CPW	CARPET (WALL BASE)
CR	CARD READER
CR	CHAIR RAIL
CRCMF	CIRCUMFERENCE
CRIT	CRITICAL
CRS	COURSE
CSK	COUNTER SINK
CSS	CLINIC SERVICE SINK
CT	CERAMIC TILE
CT	COMPUTED TOMOGRAHY
CTB	CERAMIC TILE BASE
CTR	CENTER CENTRAL
CTRD	CENTERED
CTRL	CONTROL
CU	CUBIC
CW	COLD WATER

ABBREVIATION	DESCRIPTION
dB	DECIBEL
DBL ACT DR	DOUBLE ACTING DOOR
DECON	DECONTAMINATION
DEG	DEGREE
DEMO	DEMONOLISH DEMOLITION
DEPT	DEPARTMENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIAPH	DIAPHRAGM
DIFF	DIFFUSER
DIM	DIMENSION
DIST	DISTANCE
DW	DISTILLED WATER
DL	DEAD LOAD
DMF	DAMPROOFING
DN	DOWN
DO	DOOR OPENING OR DATA OUTLET
DR	DOOR
DRP	DECAY RETARDANT PLYWOOD
DRW	DECAY RETARDANT WOOD
DS	DOWNSPOUT
DT	DRAIN TILE
DW	DISTILED WATER
DWG	DRAWING
DWL	DOWEL
E	EAST
EA	EACH
EF	EACH FACE
EIFS	EXTERIOR INSULATION & FINISH SYSTEM
EJ	EXPANDING JOINT
EKG	ELECTRO-CARDIOGRAM
EL	ELEVATION
ELEC	ELECTRICAL OR ELECTRONIC
ELEV	ELEVATOR
EMBED	EMBEDMENT
EMER	EMERGENCY
EMER SHR	EMERGENCY SHOWER
EMER SHR/EWS	EMERGENCY SHOWER/EYE WASH
ENCL	ENCLOSURE
ENTR	ENTRANCE
EQ	EQUAL
EQUIP	EQUIPMENT
ER	EMERGENCY ROOM
ETR	EXISITING TO REMAIN
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EWS	EYE WASH STATION
EX	EXISTING
EXC	EXCAVATE
EXH	EXHAUST
EXIST	EXISTING
EXTR	EXTRUDED
F/F	FACE TO FACE
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUSHER CABINET
FH	FLAT HEAD
FHR	FIRE HOSE RACK/ REEL
FIN	FINSIH OR FINISHED
FIP	FOAMED-IN-PLACE
FIXT	FIXTURE
FJ	FALSE JOINT
FLASH	FLASHING
FLG	FLANGE
FLR	FLOOR
FM	FACTORY MUTUAL
FNDN	FOUNDATION
FOC	FACE OF COLUMN
FR	FIRE RATED
FRP	FIRE RATED PLYWOOD
FRPFG	FIREPROOFING
FRW	FIRE RATED WOOD
FT	FOOT OR FEET
FTG	FOOTING
FURN	FURNITURE
g	GRAM
GA	GAUGE
GALV	GALVANIZED
GCW	GLAZED CURTAINWALL
GDR	GUARDRAIL
GEN	GENERAL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFRP	GLASS-FIBER REINFORCED PLSTIC
GHT	GLAZED HOLLOW TILE
GI	GALVANIZED IRON
GL	GLASS, GLAZING
GR	GRADE
GR BM	GRADE BEAM
GRAD	GRADIENT
GRL	GRILLE
GRTG	GRATING
GYO	GYPSUM
H	HIGH
HB	HOSE BIBB
HD	HEAVY DUTY
HDW	HARDWARE
HEX	HEXAGON
HM	HOLLOW METAL
HNDRL	HANDRAIL
HORIZ	HORIZONTAL
HOSP	HOSPITAL
HPT	HIGH POINT
HR	HOUR
HSKPG	HOUSE KEEPING
HSS	HOLLOW STRUCTURAL SECTIONS
HT	HEIGHT
HTG	HEATING
HVAC	HEATING VENTAILATION AIR CONDITIONING
HW	HOT WATER
HWY	HIGHWAY
HYD	HYDRANT

ABBREVIATION	DESCRIPTION
JC	JANITORS CLOSET
JT	JOINT
L	ANGLE
LAB	LABORATORY
LAM	LAMINATED
LAV	LAVATORY
LBS	LABORATORY
LG	LONG
LH	LEFT HAND
LHR	LEFT HAND REVERSE
LN	LINEAR
LKR	LOCKER ROOM
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LO	LOUVER OPENING
LPT	LOW POINTLTLIGHT
LT WT	LIGHTWEIGHT
LTG	LIGHTING
LVR	LOUVER
MACH	MACHINE
MAG	MAGNET OR MAGNETIC
MAR	MARBLE
MAS	MASONARY
MATL	MATERIAL
MAX	MAXIMUM
MB	MARKER BOARD
MBC	MICHIGAN BUILDING CODE
MC	MICELLANEOUS CHANNEL
MCA	MEDICAL COMRESSED AIR
MCL	METAL CEILING (LINER)
MCP	METAL CEILING (PAN)
MECH	MECHCANICAL
MED	MEDICAL
MEMB	MEMBRANE
MEMB RFG	MEMBRANE ROOFING
MEZZ	MEZZANINE
MFG	MANUFACTURING
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MOD BIT	MODIFIED BITUMEN
MR	MOISTURE RESISTANT
MRI	MAGNETIC RESONANCE IMAGING
MRT	MARBLE THRESHOLD
MTC	METAL TOILET COMPARTMENT
MTD	MOUNTED
MTL	METALIC OR METAL
MTL FAB	METAL FABRICATIONS
MULL	MULLION
N	NORTH
N2	NITROGEN
N20	NITROUS OXIDE
NARC	NARCOTICS
NATL	NATIONAL
NC	NOISE CRITERIA
NE	NORTH EAST
NFPA	NATIONAL FIRE PROTECTIONA ASSOCIATION
NIC	NOT IN CONTACT
NL	NIGHT LIGHT
NO	NUMBER OR NUMBERS
NOM	NOMINAL
NOUR	NOURISHMENT
NS	NURSE STATION
NSF	NATIONAL SANITATION FOUNDATION
NW	NORTHWEST
O2	OXYGEN
OO	OUT TO OUT
OBS	OBSERVATION
OBSC GL	OBSCURE GLASS
OBW	OBSERVATION WINDOW
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OF/CI	OWNER FURNISHED/ CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED/ OWNER INSTALLED
OFF	OFFICE
OFRC	OVERFLOW ROOF CONDUCTOR
OFRS	OVERFLOW ROOF SUMP
OH DR	OVERHEAD DOOR
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
ORIG	ORIGINAL
ORN	ORNAMENTAL
OSHA	OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
Oz	OUNCE
PACU	POST ANESTHESIA UNIT
PB	PUSH BUTTON
PC	PIECE OR PIECES
PEND	PENDENT
PERF	PERFORATED
PERM	PERMANENT
PI	POINT OF INTERSECTION
PL	PROPERTY LINE
PL GL	PLATE GLASS
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLBG	PLUMBING
PLT	PLATE OR PLATED
PLTC	PLASTIC LAMINATE TOILET COMPARTIMENT
PLYD	PLYWOOD
PMF	PERMANENT METAL FORM
PNEU	PNEUMATIC
PNL	PANEL
PORC	PORCELAIN
PORT	PORTABLE
POS	POSITION
PP	PANEL POINT
PR	PAIR
PREFAB	PREFABRICATED
PREP	PREPARATION
PROC	PROCESS OR PROCESSING

ABBREVIATION	DESCRIPTION
QT	QUARRY TILE
R	RADIUS
R	RISER
RB	RESILENT BASE
RC	ROOF CONDUCTOR
RCPTR	RECEPTOR
RCVG	RECEIVING
REC	RECESS OR RECESSED
REF	REFERENCE
REF	REFRIGERATOR
REG	REGISTER
REINF	REINFORCE OR REINFORCED
REV	REVISION
RF	RADIOGRAPHY & FLOUROSCOPY
RFG	ROOFING
RFO	ROOF OPENING
RH	RIGHT HAND
RHB	ROOF HOSE BOX
RHR	RIGHT HAND REVERSE
RM	ROOM
RND	ROUND
RO	ROUGH OPENING
RR	RAILROAD
RS	ROOF SUMP
RSF	RESILIENT SHEET FLOORING
RTF	RESILIENT TILE FLOORING
RTNG	RETAINING
RTU	ROOF TOP UNIT
RV	ROOF VENTILATOR
RVS	REVERSE
S	SOUTH
S	S-SHAPE STEEL MEMBER
SAB	SOUND ATTENUATION BLANKET
SAF	SPRAY APPLIED FIREPROOFING
SB	SOIL BORING
SCHED	SCHEDULE
SDG	SIDING
SE	SOUTHEAST
SECT	SECTION
SECY	SECRETARY
SGFT	STRUCTURAL GLAZED FACING TILE
SH	SHOWER
SHT	SHEET
SI	STEEL & IRON WORK
SIM	SIMILAR
SLDG	SLIDING
SLDG WDW	SLIDING WINDOW
SLNT	SEALANT
SLV	SHORT LEG VERTICAL
SM	SHEET METAL
SP	SHAFT PARTITION
SPEC	SPECIFICATION
SPKLR	SPRINKLER
SQ	SQUARE
SSK	SERVICE SINK
SST	STAINLESS STEEL
STA	STATION
STAG	STAGGERED
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STIF	STIFFENER
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
STRUCT STL	STRUCTURAL STEEL
SURF	SURFACE
SUSP	SUSPENDED OR SUSPENSION
SV	SHEET VINYL
SW	SOUTH WEST
SW	SWITCH
SWD-FR	SHEATHING WOOD-FIRE RETARDANT
SYM	SYMMETRICAL
T	TREAD
T & G	TOUNGUE & GROOVE
T & R	TREAD & RISER
TA	TOILET ACCESSORIES
TB	TACK BOARD
TBD	TO BE DETERMINED
TEL	TELEPHONE
TEMP	TEMPERATURE
TERR	TERRAZZO
THD	THREAD
THK	THICK OR THICKNESS
THRESH	THRESHOLD
TK BD	TACKBOARD
TOC	TOP OF CONCRETE (ELEVATION)
TOIL	TOILET
TOIL RM	TOILET ROOM
TOR	TOP OF RAIL (ELEVATION)
TOS	TOP OF STEEL (ELEVATION)
TOW	TOP OF WALL (ELEVATION)
TRAN	TRANSOM
TV	TELEVISION
TYP	TYPICAL
UC	UNDERCABINET
UG	UNDERGROUND
UM	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
UN	UNLESS NOTED
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
U/S	UNDERSIDE
VAC	VACUUM
VENT	VENTILATION OR VENTILATING
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VIT	VITREOUS
VOL	VOLUME
VTR	VENT THROUGH ROOF
VWC	VINYL WALL COVERING
W	WEST
W	WIDE FLANGE SHAPES
W	WIDE OR WIDTH

TYPICAL NOTES

TYPICAL CONSTRUCTION NOTES:

1. ALL WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE AND LOCAL CODES, ORDINANCES AND REGULATIONS.
2. ALL MATERIALS SHALL BE INSTALLED/APPLIED IN STRICT ACCORDANCE WITH MANUFACTURER'S REGULATIONS.
3. CONTRACTOR SHALL BE HELD RESPONSIBLE FOR VISITING THE JOB SITE AND FAMILIARIZING THEMSELVES WITH EXISTING CONDITIONS PRIOR TO START OF WORK. ALL FIELD CONDITIONS SHALL BE VERIFIED, AND CONSTRUCTION MANAGER NOTIFIED OF ANY DISCREPANCIES PRIOR TO THE RECEIPT OF BIDS. FAILURE OF THE CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO THE AWARD OF BID WILL NOT BE CONSIDERED AS GROUNDS FOR AN EXTRA.
4. ALL EXISTING DIMENSIONS ARE TO BE VERIFIED IN THE FIELD BY CONTRACTOR PRIOR TO THE FABRICATION OR PURCHASE OF MATERIALS.
5. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR INITIATING, MAINTAINING AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE PERFORMANCE OF THE CONTRACT. PROVIDE ALL NECESSARY TEMPORARY PROTECTION, SHORING, BRACING, ETC. AS REQUIRED TO ENSURE THE SAFETY OF THE GENERAL PUBLIC DURING CONSTRUCTION.
6. ALL ITEMS SHALL BE AS SPECIFIED BY ARCHITECT. SUBMIT SUBSTITUTION REQUESTS DURING BIDDING FOR REVIEW.
7. SUBMIT SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION/APPLICATION.
8. ALL DEBRIS SHALL BE LEGALLY DISPOSED OF OFF THE SITE BY THE CONTRACTOR.
9. ALL PRECAUTIONS SHALL BE TAKEN TO AVOID DAMAGE TO EXISTING MATERIALS AND CONSTRUCTION TO REMAIN.
10. CONTRACTOR SHALL CUT AND PATCH EXISTING WALLS, FLOORS, CEILINGS, ETC., AS REQUIRED TO COMPLETE THE WORK WITHOUT EXTRA COST TO OWNER.
11. CONTRACTOR SHALL KEEP NOISE, DUST, ETC., TO A MINIMUM STANDARD AS SET FORTH BY THE OWNER.
12. CONTRACTOR SHALL COORDINATE INSTALLATION AND PHASING OF WORK WITH THE CONSTRUCTION MANAGER PRIOR TO THE START OF WORK.

ARCHITECTURAL SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
N	PROJECT NORTH - TRUE NORTH AS INDICATED ONLY ON SITE PLAN		
OFFICE 101	ROOM NAME & NUMBER		NEW DOOR
-	DOOR SCHEDULE TAG		
5 B 6 7 A2.1	INTERIOR ELEVATION SYMBOL		
10 A4.3	EXTERIOR ELEVATION SYMBOL		
11 A4.1	WALL SECTION / DETAIL		
1 A1.6	DETAIL OR PLAN ENLARGEMENT		
1A A6.01	MODEL ROOM REFERENCE NUMBER - SEE REFERENCED DETAIL SHEET FOR ADDITIONAL INFORMATION REFERENCED DETAIL SHEET		

DETAIL NUMBER

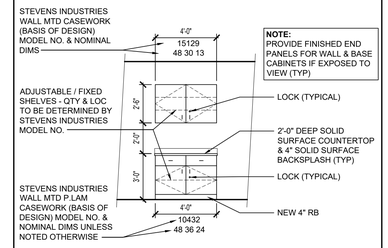
DETAIL TITLE
- TITLES INDICATED ARE FOR CONVENIENCE ONLY AND DO NOT NECESSARILY IDENTIFY ALL LOCATIONS WHER THE DETAIL OCCURS

3 AC-1.0 — INTERIOR ELEVATION

S C A L E : 1/4" = 1' - 0"

DETAIL SCALE

DETAIL REFERENCE
- WHEN PRESENT, REFERENCE INDICATION IDENTIFIES SHEETS WHERE THE DETAIL OCCURS
- REFERENCES INDICATED ARE FOR CONVENIENCE ONLY, AND DO NOT NECESSARILY INCLLUDE ALL LOCATIONS WHERE THE DETAIL OCCURS



3 A-1.0 — INTERIOR ELEVATION TYPICAL NOTES

S C A L E : 1/4" = 1' - 0"

WA

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MACOMB COUNTY EXECUTIVE BOARD OF COMMISSIONERS

HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

GENERAL INFORMATION

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY DCW
CHECKED BY RAS/DCW

REVISIONS

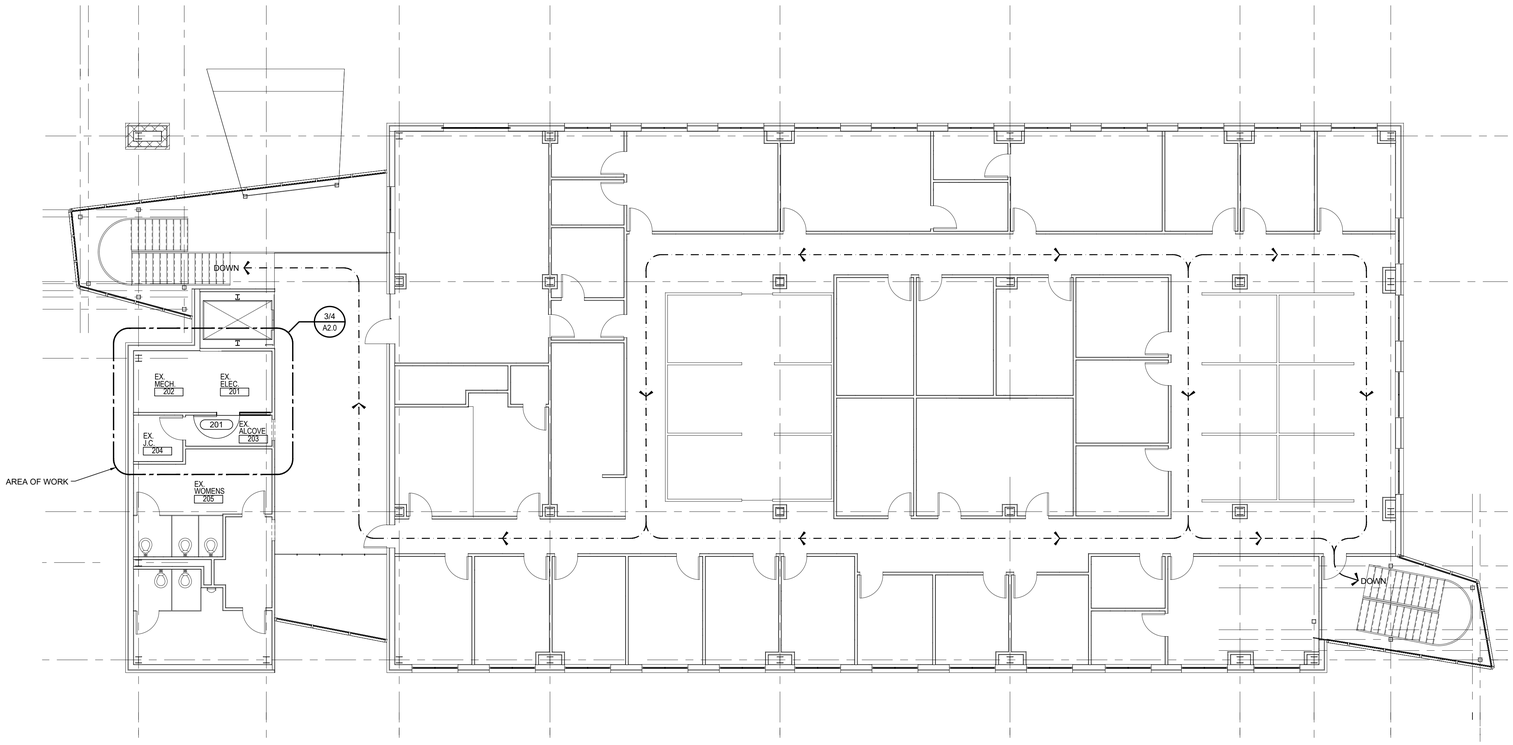
BIDS	05/12/2025

DATE: MAY 12, 2025

SHEET NO.

G2.0

JOB NO. 242043



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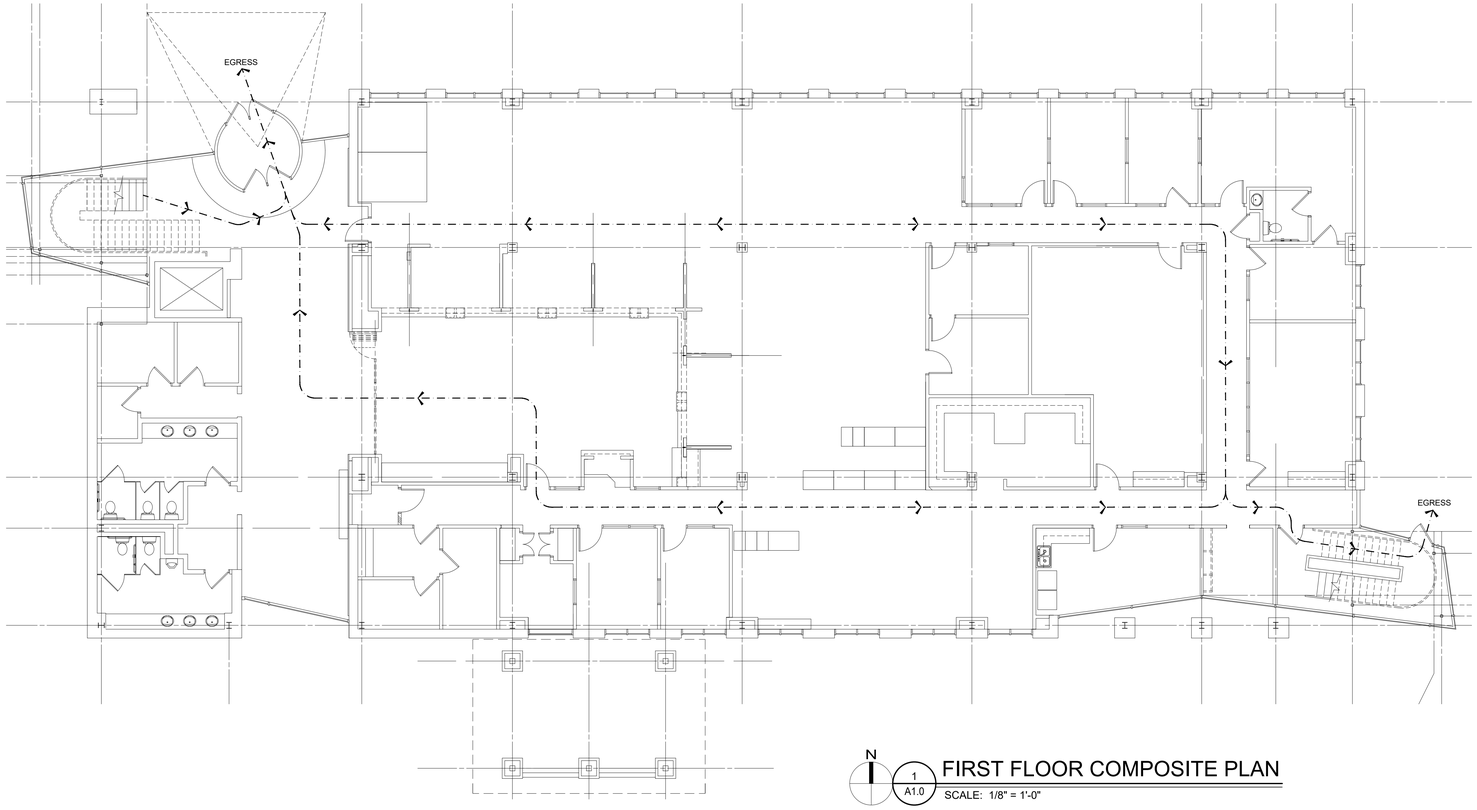
2 A1.0 SECOND FLOOR COMPOSITE PLAN

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



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1 A1.0 FIRST FLOOR COMPOSITE PLAN

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

BUILDING CODE SUMMARY:

PROJECT CODES:

BUILDING:	2021 MICHIGAN BUILDING CODE
MECHANICAL:	2021 MICHIGAN BUILDING CODE
PLUMBING:	2021 MICHIGAN PLUMBING CODE
ELECTRICAL:	2023 MICHIGAN ELECTRICAL CODE
RENOVATION:	2021 MICHIGAN REHABILITATION CODE
ENERGY:	2015 MICHIGAN ENERGY CODE

BUILDING DATA:

USE GROUP:	B - BUSINESS

CONSTRUCTION TYPE:

	TYPE 2B (PER 20000 MBC, CODE IN PLACE AT TIME OF CONSTRUCTION
SPRINKLED:	COMPLETE

GROSS AREA:

FIRST FLOOR	11,554 GSF
SECOND FLOOR:	11,108 GSF
WORK AREA:	146 S.F.

LIFE SAFETY SYSTEMS

EMERGENCY LIGHTING AND EXIT SIGNS:	REQUIRED, PROVIDED
FIRE ALARM	REQUIRED, PROVIDED
SMOKE DETECTION SYSTEM	REQUIRED, PROVIDED
PANIC HARDWARE	REQUIRED, PROVIDED
FIRE SUPPRESSION SYSTEM	REQUIRED, PROVIDED
EXIT REQUIREMENTS	REFER TO COMPOSITE FLOOR PLANS

WAKELY ASSOCIATES, INC.
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MACOMB COUNTY EXECUTIVE BOARD OF COMMISSIONERS

HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

COMPOSITE FLOOR PLANS
FIRST FLOOR &
SECOND FLOOR

PRELIMINARY	☐
DESIGN DEVELOPMENT	☐
CONSTRUCTION	■
FINAL RECORD	☐

DRAWN BY DCW
CHECKED BY RAS/DCW

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SHEET NO.

A1.0

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ROOM FINISH SCHEDULE

NO.	ROOM NAME	FLOOR	BASE	WALLS	CEILING MAT'L	CEILING HEIGHT	REMARKS
201	ELECTRICAL	ETR/SC	4RB	ETR/GYP/PT	ETR/PT	ETR	3,5,6
202	MECHANICAL	ETR/SC	4RB	ETR/GYP/PT	ETR/PT	ETR	5
203	ALCOVE	LVT	4RB	PT	PT	ETR	4,7

ROOM FINISH SCHEDULE GENERAL NOTES:

1. SEE ALL PLANS FOR EXTENT OF NEW WORK.
2. INSTALL NEW BASE ON NEW WALLS TO MATCH EXISTING (V.I.F.)

ABBREVIATIONS:

VWC - VINYL WALL COVERING
CPT - CARPET
ETR - EXISTING TO REMAIN
GYP - GYPSUM BOARD
RB - RESILIENT BASE
SC - SEALED CONCRETE
PT - PAINT

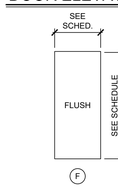
ROOM FINISH NOTES:

1. ALL EXISTING FINISHES TO REMAIN UNLESS NOTED OTHERWISE.
2. PAINT ALL EXISTING WALLS IN NEW WORK AREA.
3. MATCH EXISTING RESILIENT BASE. VERIFY HEIGHT IN FIELD.
4. SKIM COAT ALL WALLS AS REQUIRED AFTER GLUE IS COMPLETELY REMOVED PRIOR TO PRIMING OF WALL.
5. PROVIDE NEW RESILIENT TRANSITION STRIP BETWEEN NEW LVT AND EXISTING ELEC. ROOM FLOOR AT NEW DOOR OPENING.
6. MODIFY EXISTING GYP. BRD. CEILING AND WALL AS REQUIRED TO RELOCATE DOOR OPENING.
7. REMOVE ALL EXISTING HANGERS AND PATCH ALL HOLES IN WALLS PRIOR TO PAINTING

DOOR SCHEDULE

NO.	DOOR OPENING WIDTH	DOOR OPENING HEIGHT	DOOR TYPE	DOOR MATERIAL	DOOR FINISH	FRAME TYPE	FRAME MATERIAL	FRAME FINISH	THRESHOLD	U.L. LABEL	HARDWARE SET	REMARKS
201	3'-6"	8'-0"	F	HM	PT	1	HM	PT	-	-	01	

DOOR ELEVATION:



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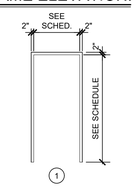
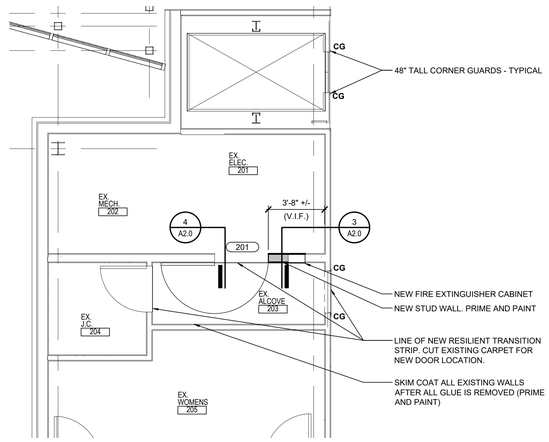




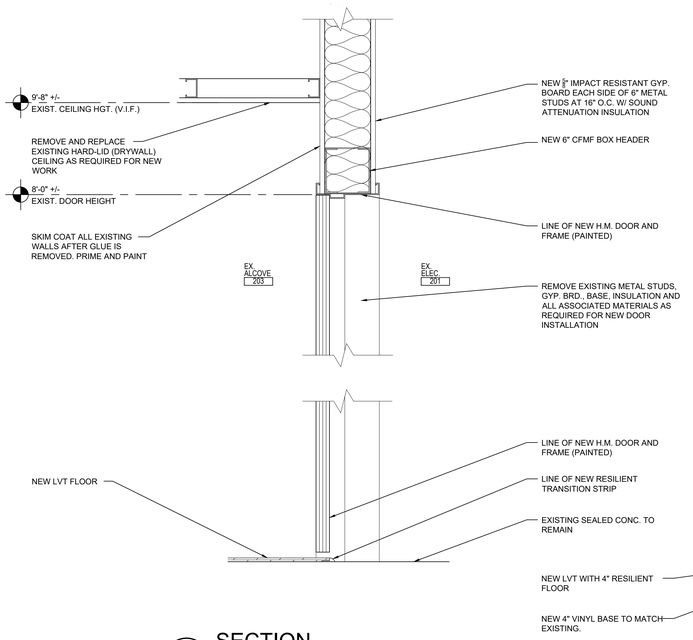
N

2 A2.0 ENLARGED NEW WORK PLAN

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

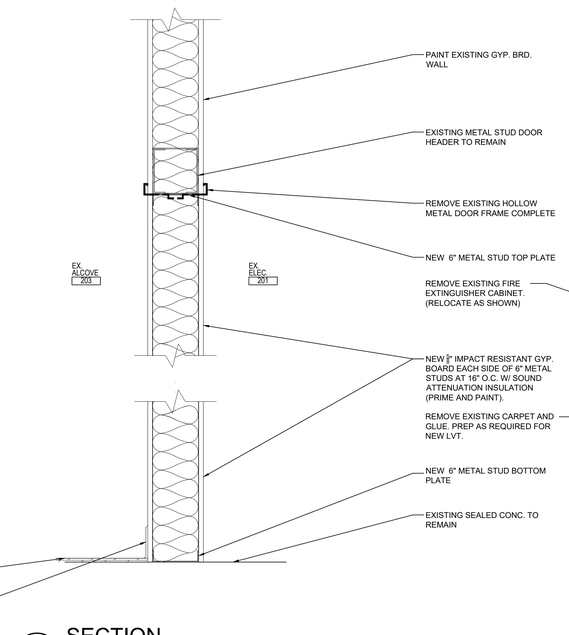
WALL TYPE:

⅝" IMPACT RESISTANT GYP. BRD. (EACH SIDE) ON 3⅝" METAL STUDS AT 16" O.C. WITH SOUND ATTENUATION INSULATION.



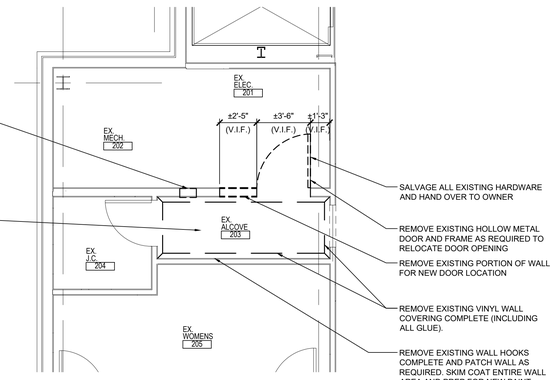
4 A2.0 SECTION

SCALE: 1½"=1'-0"



3 A2.0 SECTION

SCALE: 1½"=1'-0"



N

1 A2.0 ENLARGED DEMO. PLAN

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

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MACOMB COUNTY EXECUTIVE BOARD OF COMMISSIONERS

HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

COMPOSITE FLOOR PLAN -FIRST FLOOR

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

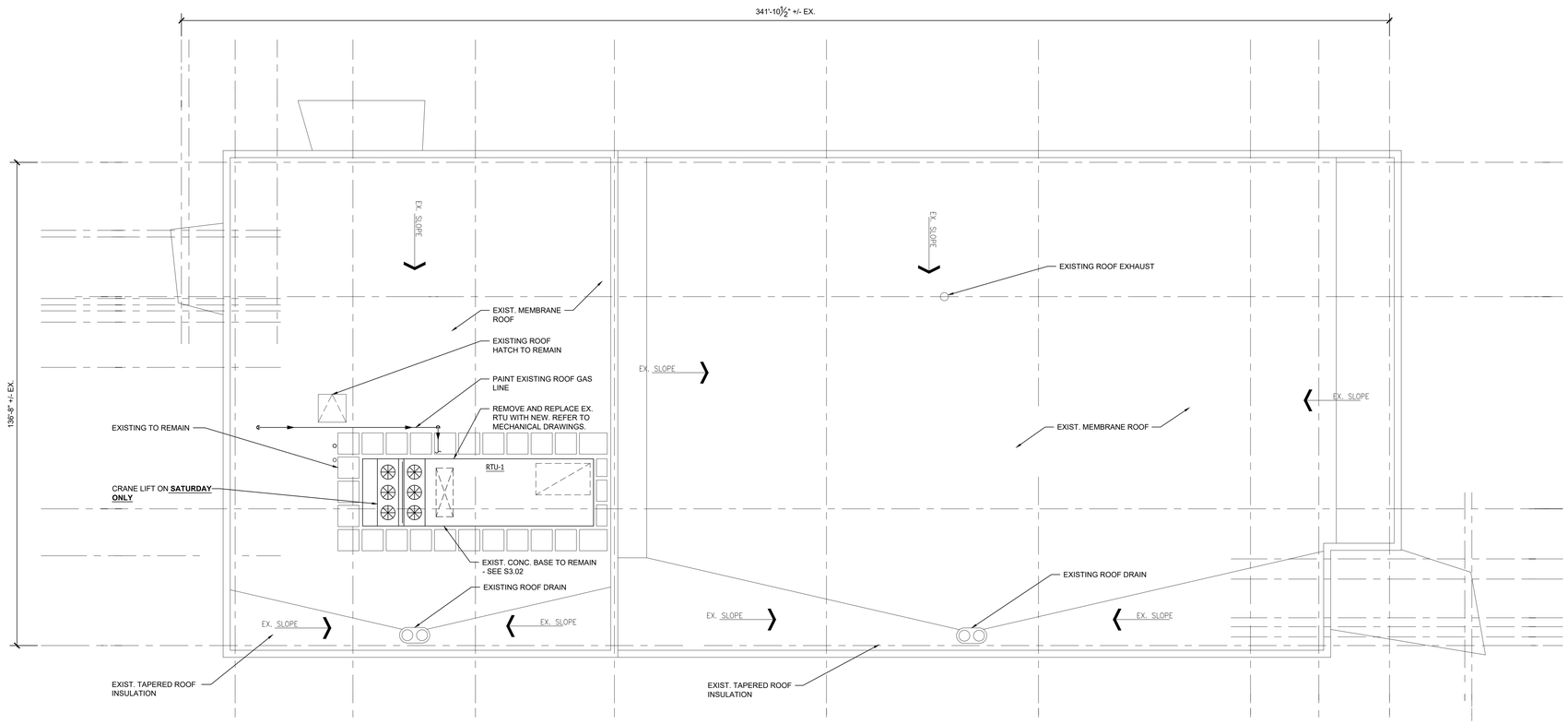
DRAWN BY DCW
CHECKED BY RAS/DCW

REVISIONS
BIDS 05/12/2025

DATE: MAY 12, 2025

SHEET NO.
A2.0

JOB NO.
242043



N

1
A3.0

COMPOSITE ROOF PLAN

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

GENERAL NOTE:
ROOFING CONTRACTOR SHALL BE AN APPROVED CERTIFIED INSTALLER OF THE EXISTING ROOF MANUFACTURER. REFER TO OWNERS WARRANTY AND MANUFACTURERS REQUIREMENTS PRIOR TO REPLACING SINGLE PLY ROOFING. ALL MATERIALS AND METHODS USED SHALL BE IN ACCORDANCE W/ MANUFACTURES MATERIALS AND METHODS NOT TO VOID THE CURRENT WARRANTY.

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PRELIMINARY ☐
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CONSTRUCTION ■
FINAL RECORD ☐

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CHECKED BY RAS/DCW

REVISIONS

BIDS	05/12/2025

DATE: MAY 12, 2025

SHEET NO.

A3.0

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MECHANICAL ABBREVIATIONS

ABBREV.	DESCRIPTION
AAV	AUTOMATIC AIR VENT / AIR ADMITTANCE VALVE
AD	ACCESS DOOR
AE	AIR EXTRACTOR
AFF	ABOVE FINISHED FLOOR
APD	AIR PRESSURE DROP
ASR	AUTOMATIC SPRINKLER RISER
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
BWV	BACKWATER VALVE
CAP	CAPACITY
CAV	CONSTANT AIR VOLUME
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CIRC	CIRCULATING
CLG	COOLING
CO	CLEAN OUT
CONT	CONTINUATION OR CONTINUED
CONV	CONVECTOR
CUH	CABINET UNIT HEATER
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DEG	DEGREES
DDC	DIRECT DIGITAL CONTROL
DN	DOWN
DTC	DRAIN TILE CONNECTION
DWH	DOMESTIC WATER HEATER
(E)	EXISTING
EA/EXH	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB TEMPERATURE
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION
ELECT	ELECTRICAL
EMS	ENERGY MANAGEMENT SYSTEM
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB TEMPERATURE
EWC	ELECTRIC WATER COOLER
°F	DEGREES FAHRENHEIT
FA	FACE AREA (COIL) / FREE AREA (LOUVER)
FC	FLEXIBLE CONNECTION
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FHV	FIRE HOSE VALVE
FLA	FULL LOAD AMPS
FLR	FLOOR
FPM	FEET PER MINUTE
FFD	FUNNEL FLOOR DRAIN
FFE	FINISHED FLOOR ELEVATION
FS	FLOOR SINK
FT	FEET
FURN	FURNISHED
FV	FACE VELOCITY
FVC	FIRE VALVE CABINET
GAL	GALLON
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HB	HOSE BIBB
HO	HUB OUTLET
HP	HORSEPOWER

MECHANICAL ABBREVIATIONS

ABBREV.	DESCRIPTION
HR	HOUR
HTG	HEATING
HYD	HYDRANT
HZ	HERTZ
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
INST	INSTALLED
INV	INVERT
ISP	INTERNAL STATIC PRESSURE
IW	INDIRECT WASTE
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LBS/HR	POUNDS PER HOUR
LDB	LEAVING DRY BULB TEMPERATURE
LRA	LOCKED ROTOR AMPS
LWB	LEAVING WET BULB TEMPERATURE
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	1000 BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MOD	MOTOR OPERATED DAMPER (AUTOMATIC)
MOP	MAXIMUM OVER-CURRENT PROTECTION
N.C.	NOISE CRITERIA
NIC	NOT IN CONTRACT
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NOM	NOMINAL
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER / CENTER TO CENTER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
ORS	OVERFLOW ROOF SUMP
OS&Y	OUTSIDE SCREW AND YOKE
PD	PRESSURE DROP (FEET OF WATER)
PRV	PRESSURE REDUCING VALVE
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAUGE
PT	PRESSURE / TEMPERATURE PORT
RA	RETURN AIR
RH	RELATIVE HUMIDITY
REQD	REQUIRED
REL.A	RELIEF AIR
RPM	REVOLUTIONS PER MINUTE
RPZ	REDUCED PRESSURE ZONE
RS	ROOF SUMP
SA	SUPPLY AIR
SH	SHOWER
SP	STATIC PRESSURE
SqFt / SF	SQUARE FOOT/SQUARE FEET
SS	SERVICE SINK
TC	TEMPERATURE CONTROL
T & P	TEMPERATURE AND PRESSURE
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE

MECHANICAL ABBREVIATIONS

ABBREV.	DESCRIPTION
UR	URINAL
VD	VOLUME DAMPER (MANUALLY ADJUSTABLE)
VTR	VENT THRU ROOF
W	WASTE
W&V	WASTE AND VENT
WB	WET BULB TEMPERATURE
WC	WATER CLOSET
WG	WATER GAUGE
WH	WALL HYDRANT

MECHANICAL PIPING SYMBOLS

ABBREV.	DESCRIPTION
	PIPE ELBOW UP
	PIPE ELBOW DOWN
	PIPE TEE DOWN
	DIRECTION OF FLOW
	UNION
	STRAINER
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	EXPANSION JOINT
	FLEXIBLE CONNECTION
	PIPE ANCHOR
	PIPE GUIDE
	PIPE CAP OR PLUG
	ISOLATION VALVE
	CIRCULATING PUMP
	GLOBE VALVE
	BALL VALVE
	BUTTERFLY VALVE
	ANGLE VALVE
	CHECK VALVE (SWING)
	CHECK VALVE (SPRING)
	PLUG VALVE
	NEEDLE VALVE
	OUTSIDE SCREW AND YOKE VALVE (OS&Y)
	PRESSURE REGULATING VALVE
	SOLENOID VALVE
	CONTROL VALVE (2-WAY / 3-WAY)
	CENTRIFUGAL FAN
	AUTOMATIC GAS SHUT-OFF VALVE
	TRAP (PLAN VIEW)
	FLOOR DRAIN / FUNNEL FLOOR DRAIN (PLAN VIEW)
	FLOOR DRAIN / FUNNEL FLOOR DRAIN (ELEVATION)
	ROOF SUMP
CO	CLEAN OUT (IN FLOOR)
CO	CLEAN OUT (IN LINE)
WCO	CLEAN OUT (WALL)
BFP	BACKFLOW PREVENTER
M	WATER METER ASSEMBLY
	HOSE BIBB, WALL HYDRANT
	DIRECTION OF PIPE PITCH
	SPRINKLER HEAD (UPRIGHT)
	SPRINKLER HEAD (SIDEWALL)
FS	FLOW SWITCH
	SIAMESE CONNECTION (YARD)
	SIAMESE CONNECTION (WALL MOUNTED)
	FIRE HYDRANT
	FLOW MEASURING DEVICE
	BALANCING VALVE
	COMBINATION FLOW MEASURING AND BALANCING DEVICE
AAV	AUTOMATIC AIR VALVE
MAV	MANUAL AIR VALVE

MECHANICAL SYMBOLS

ABBREV.	DESCRIPTION
	RECTANGULAR TAKE-OFF (SINGLE LINE)
	RECTANGULAR TAKE-OFF (DOUBLE LINE)
	ROUND TAKE-OFF (SINGLE LINE)
	ROUND TAKE-OFF (DOUBLE LINE)
	SPIN-IN FITTING (WITH VOLUME DAMPER)
	ELBOW (WITH TURNING VANES)
	RADIUS RECTANGULAR ELBOW
	RADIUS ROUND ELBOW
	RECTANGULAR ELBOW UP
	ROUND ELBOW UP
	RECTANGULAR ELBOW DOWN
	ROUND ELBOW DOWN
	CONCENTRIC TRANSITION (DOUBLE LINE)
	CONCENTRIC TRANSITION (SINGLE LINE)
	ECCENTRIC TRANSITION (DOUBLE LINE)
	ECCENTRIC TRANSITION (SINGLE LINE)
R	INCLINED RISE IN DIRECTION OF AIR FLOW (DOUBLE LINE)
R	INCLINED RISE IN DIRECTION OF AIR FLOW (SINGLE LINE)
D	INCLINED DROP IN DIRECTION OF AIR FLOW (DOUBLE LINE)
D	INCLINED DROP IN DIRECTION OF AIR FLOW (SINGLE LINE)
	FLEXIBLE CONNECTION
	FLEXIBLE DUCT CONNECTION TO SUPPLY DIFFUSER
	SUPPLY DIFFUSER
	LINEAR SLOT DIFFUSER
	RETURN OR EXHAUST GRILLE
	TRANSFER GRILLE
	CROSS SECTION OF SUPPLY AIR DUCT
	CROSS SECTION OF EXHAUST OR RETURN AIR DUCT
EXISTING	FIRE DAMPER (HORIZONTAL)
NEW	
EXISTING	FIRE DAMPER (VERTICAL)
NEW	
EXISTING	SMOKE DAMPER
NEW	
EXISTING	COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
NEW	
EXISTING	COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
NEW	
	VOLUME DAMPER (MANUALLY ADJUSTABLE)
M	MOTORIZED DAMPER
SD	SMOKE DETECTOR
CO2	CO2 SENSOR
T	THERMOSTAT OR TEMPERATURE SENSOR
H	HUMIDISTAT OR HUMIDITY SENSOR
	RETURN OR EXHAUST / SUPPLY AIR FLOW

PIPING LEGEND

ABBREV.	DESCRIPTION
CA	COMPRESSED AIR PIPING
CD	CONDENSATE DRAIN PIPING
DT	DRAIN TILE
F	FIRE PROTECTION PIPING
FOR	FUEL OIL RETURN PIPING
FOS	FUEL OIL SUPPLY PIPING
G	NATURAL GAS PIPING
BCW	BOOSTED-DOMESTIC COLD WATER PIPING
BHW	BOOSTED-DOMESTIC HOT WATER PIPING
CW	DOMESTIC COLD WATER PIPING
NPCW	NON POTABLE COLD WATER PIPING
TW	TEMPERED WATER PIPING
HW	DOMESTIC HOT WATER PIPING
HW(140°F)	DOMESTIC 140°F HOT WATER PIPING
HWR	DOMESTIC HOT WATER RETURN PIPING
SAN	SANITARY WASTE PIPING
PSAN	PUMPED SANITARY PIPING
V	VENT PIPING
ST	STORM SEWER PIPING
PST	PUMPED STORM PIPING
RC	RAIN CONDUCTOR PIPING
ORC	OVERFLOW RAIN CONDUCTOR PIPING
CHWR	CHILLED WATER RETURN PIPING
CHWS	CHILLED WATER SUPPLY PIPING
CWR	CONDENSER WATER RETURN PIPING
CWS	CONDENSER WATER SUPPLY PIPING
HHWR	HEATING HOT WATER RETURN PIPING
HHWS	HEATING HOT WATER SUPPLY PIPING
HPLR	HEAT PUMP LOOP RETURN PIPING
HPLS	HEAT PUMP LOOP SUPPLY PIPING
RL	REFRIGERANT LIQUID PIPING
RS	REFRIGERANT SUCTION PIPING
HGB	HOT GAS BY-PASS PIPING
GXHR	GEO HEAT EXCHANGE RETURN
GXHS	GEO HEAT EXCHANGE SUPPLY
STM	STEAM PIPING
HPS	HIGH PRESSURE STEAM PIPING
LPS	LOW PRESSURE STEAM PIPING
CR	STEAM CONDENSATE RETURN PIPING
PCR	PUMPED STEAM CONDENSATE RETURN PIPING
LPC	LOW PRESSURE CONDENSATE PIPING
HPC	HIGH PRESSURE CONDENSATE PIPING
MA	MEDICAL AIR PIPING
N	NITROGEN GAS PIPING
O2	OXYGEN GAS PIPING
VAC	VACUUM PIPING

DRAWING INDEX

SHT NO	DESCRIPTION
M0.00	MECHANICAL GENERAL INFORMATION
M2.10	MECHANICAL DEMOLITION SECOND FLOOR PLAN
M3.10	MECHANICAL DEMOLITION ROOF PLAN
M2.10	MECHANICAL NEW WORK SECOND FLOOR PLAN
M3.10	MECHANICAL NEW WORK ROOF PLAN
M4.00	ENLARGED BOILER ROOM PLANS
M6.00	MECHANICAL SCHEDULES AND DETAILS
M7.00	MECHANICAL PIPING DIAGRAM
M8.00	TEMPERATURE CONTROLS

DRAWING NOTATION

SYMBOL	DESCRIPTION
1	NEW WORK KEY NOTE NO. 1
1	DEMOLITION KEY NOTE NO. 1
AHU-1	EQUIPMENT TAG
S-1 12x12 150-2	AIR TERMINAL TAG: IE: DIFFUSER TYPE = S-1 NECK SIZE = 12x12 CFM = 150 (TYPICAL FOR 2) S = SUPPLY R = RETURN E = EXHAUST T = TRANSFER
	EXISTING DEVICES OR EQUIPMENT
	NEW OR MODIFIED DEVICES OR EQUIPMENT
	EXISTING SYSTEM COMPONENT TO BE REMOVED
	POINT OF NEW CONNECTION

APPLICABLE CODES AND REGULATIONS

YEAR	CODE
2015	MICHIGAN BUILDING CODE
2015	MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS
2021	MICHIGAN PLUMBING CODE
2021	MICHIGAN MECHANICAL CODE
2015	MICHIGAN UNIFORM ENERGY CODE
2015	INTERNATIONAL FUEL GAS CODE
2012	NFPA 101 WITH BFS AMENDMENTS

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HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

MECHANICAL GENERAL INFORMATION

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DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY DJL
CHECKED BY DJL

REVISIONS

BIDS	05/12/2025

DATE: APRIL 01, 2025

SHEET NO.

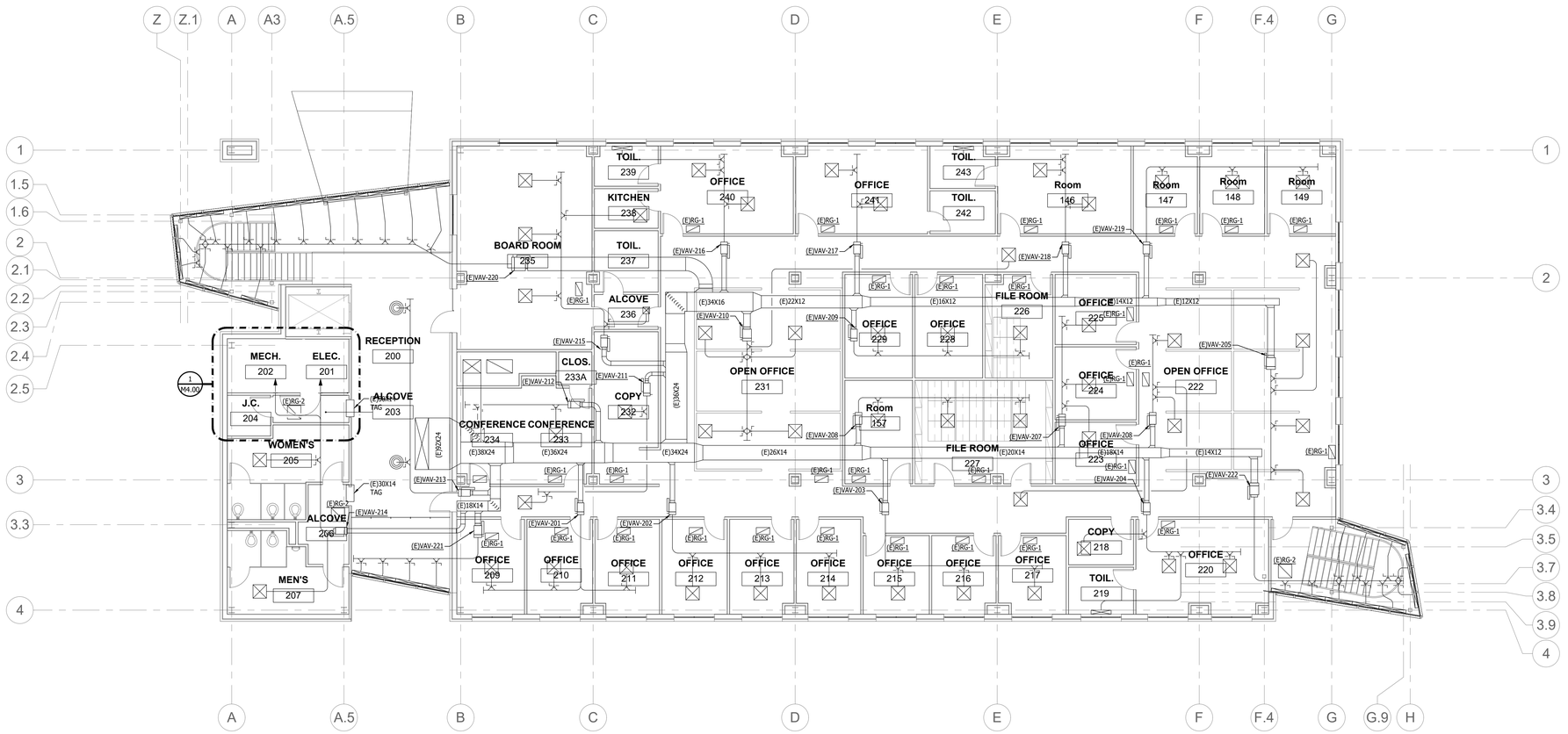
M0.00

JOB NO.

242043

GENERAL DEMOLITION NOTES

A	THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE DETERMINED BY THE NEW WORK.
B	ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
C	PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTILITIES. NOTIFY DESIGN PROFESSIONAL OF ANY INTERFERENCES OR DISCREPENCIES.
D	ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETE WITH ALL RELATED ITEMS INCLUDING HANGARS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTS.
E	THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER PROVIDED EQUIPMENT.
F	VERIFY DEPTH, SIZE, LOCATIONS, AND CONDITIONS OF EXISTING UTILITIES IN THE FIELD. INCLUDING POINTS OF CONNECTION PRIOR TO STARTING ANY WORK.
G	ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
H	ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WHERE DUCT WORK PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.



MECHANICAL DEMOLITION SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"

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MECHANICAL DEMOLITION SECOND FLOOR PLAN

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DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
CHECKED BY TJO

REVISIONS
BIDS 05/12/2025

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MD2.10

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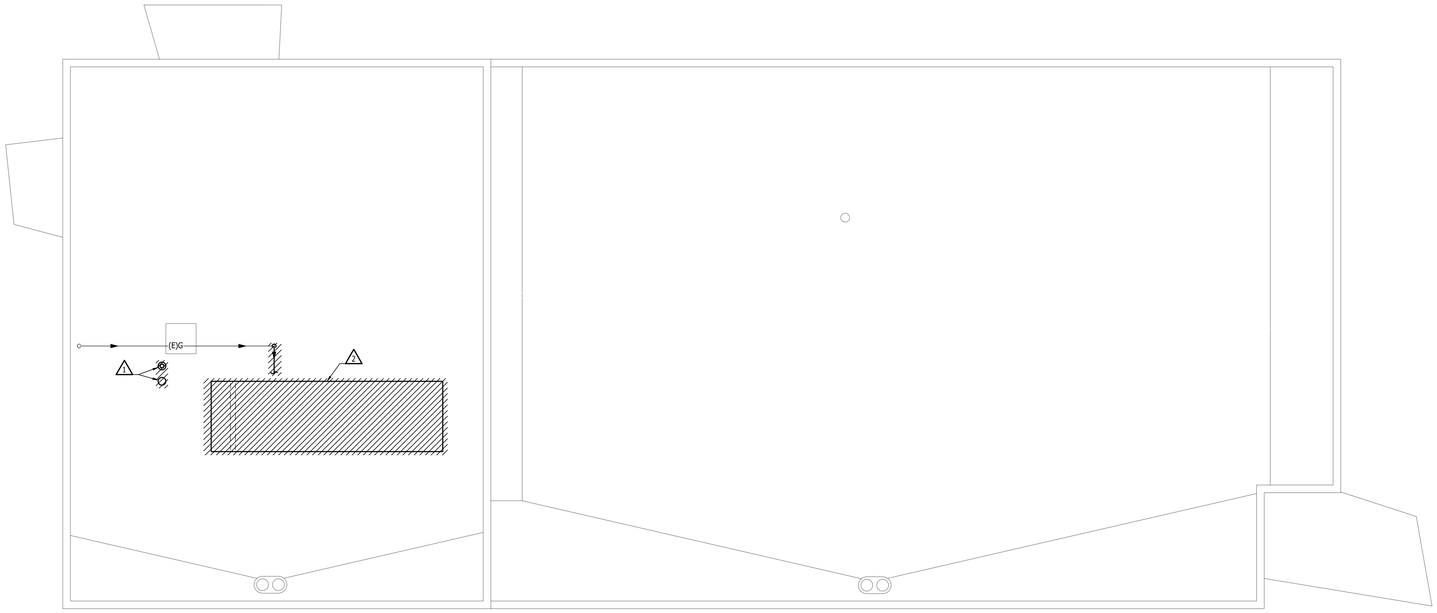
C	PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTILITIES. NOTIFY DESIGN PROFESSIONAL OF ANY INTERFERENCES OR DISCREPANCIES.
D	ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETE WITH ALL RELATED ITEMS INCLUDING HANGARS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTS.
E	THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER PROVIDED EQUIPMENT.
F	VERIFY DEPTH, SIZE, LOCATIONS, AND CONDITIONS OF EXISTING UTILITIES IN THE FIELD. INCLUDING POINTS OF CONNECTION PRIOR TO STARTING ANY WORK.
G	ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
H	ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WHERE DUCT WORK PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.

⚠ DEMOLITION KEYED NOTES

1	REMOVE EXISTING BOILER AND COMBUSTION AIR COMPLETE. PREPARE ROOF OPENINGS FOR FUTURE CONNECTION.
2	REMOVE EXISTING ROOFTOP UNIT AND ALL ASSOCIATED COMPONENTS COMPLETE. REMOVE SUPPLY AND RETURN AIR DUCTS AS REQUIRED FOR INSTALLATION OF NEW UNIT. EXISTING CURB AND BASE RAIL TO REMAIN. REFER TO NEW WORK PLANS FOR FURTHER INFORMATION.



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

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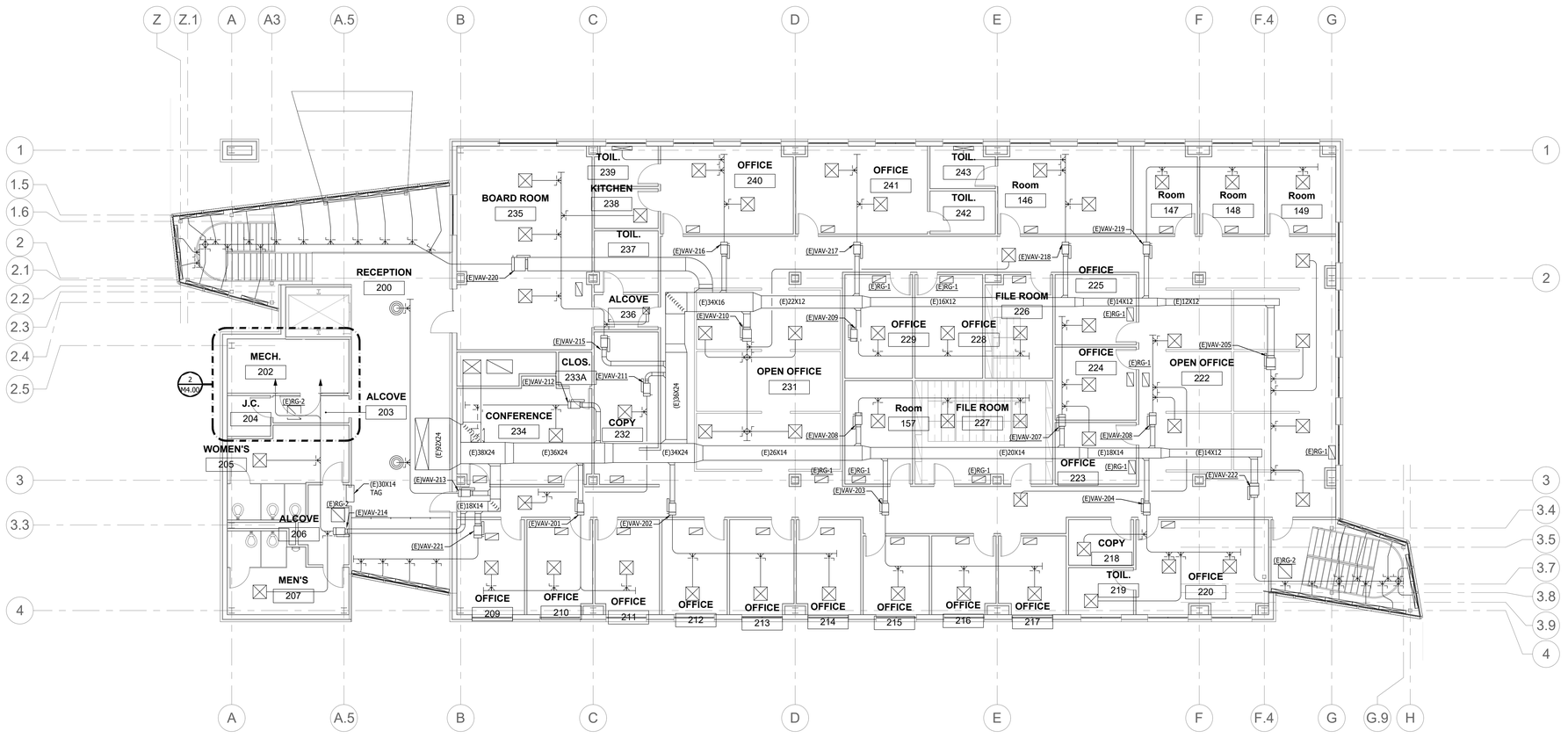

MECHANICAL NEW WORK SECOND FLOOR PLAN

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

HVAC GENERAL NOTES

A	THESE DRAWINGS ARE DIAGRAMMATIC AND REPRESENT THE GENERAL EXTENT OF WORK TO BE PERFORMED. PROVIDE AND EXECUTE ALL HVAC SYSTEMS PER ENGINEER'S SPECIFICATION, AND LOCAL APPLICABLE CODES INCLUDING AMENDMENTS, BULLETINS, ETC; AS WELL AS THE STANDARDS OF INSTALLATION AND EQUIPMENT ESTABLISHED FOR THE BUILDINGS, AND REQUIREMENTS OF THE OWNER.
B	EXCEPT FOR CHANGES AS MAY BE SPECIFICALLY APPROVED BY THE ENGINEER OF RECORD, IN ACCORDANCE WITH ALTERNATES OF OPTIONS AS STATED HEREINAFTER, ALL WORK MUST BE IN FULL ACCORDANCE WITH THE INTENT OF THE PLANS AND SPECIFICATIONS. SYSTEMS ARE TO BE COMPLETE, EFFICIENT, AND SATISFACTORY OPERATION WHEN PROJECT IS DELIVERED TO THE OWNER.
C	THE CONTRACTOR AND EACH SUBCONTRACTOR COVENANTS AND AGREES TO INDEMNIFY, DEFEND, AND HOLD HARMLESS THE CONSULTING ENGINEER, ARCHITECT, AND OWNER FROM AND AGAINST ANY LIABILITY, LOSS, DAMAGE, OR EXPENSE INCLUDING ATTORNEY'S ARISING FROM A FAILURE OR ALLEGED FAILURE ON THE PART OF THE CONTRACTOR, SUBCONTRACTORS, AND THEIR AGENTS/EMPLOYEES PROPERLY TO DISCHARGE THE OBLIGATIONS ASSUMED BY HIM/HER IN THE PERFORMANCE OF THE WORK, INCLUDING ANY ACT OR OMISSION ALLEGEDLY RESULTING IN DEATH, PERSONAL INJURY, PROPERTY DAMAGE, OR IMPROPER CONSTRUCTION PROTOCOL.
D	CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVAL FROM GOVERNING AUTHORITIES, FILE NECESSARY FORMS, PAY ALL INSPECTION FEES.
E	CONTRACTOR TO EXAMINE ALL ADJOINING WORK BEFORE COMMENCEMENT OF HIS/HER SCOPE OF WORK. REPORT ANY DISCREPANCIES TO THE CONSTRUCTION MANAGER FOR REVIEW AND APPROVAL. COORDINATE ALL WORK WITH OTHER TRADES TO ENSURE THAT INSTALLATION IS MADE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
F	PROVIDE REQUIRED CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT; DUCTWORK/PIPING SHALL NOT INTERFERE WITH ELECTRICAL EQUIPMENT CLEARANCE.
G	CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. ALL PIPING CONNECTIONS SHALL BE MINIMUM 3/4" UNLESS NOTED OTHERWISE.
H	FURNISH ADEQUATE LIABILITY INSURANCE AND BONDING DOCUMENTS AS REQUIRED BY THE OWNER.
J	ALL SUPPORT ANCHORS SECURED TO THE BOTTOM OF FLOOR SLABS SHALL BE DROP-IN OR SLEEVE ANCHOR TYPE. ALL SUPPORTING STEEL SHALL BE PROVIDED BY THE CONTRACTOR.
K	DUCTWORK/PIPING SHALL NOT BE INSTALLED IN A LOCATION THAT RESTRICTS THE ACCESS TO MECHANICAL DEVICES REQUIRING ACCESS.
L	THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL FOR THE PROPER INSTALLATION OF MECHANICAL SYSTEMS.
M	BRANCH DUCTWORK TO GRILLES, REGISTERS, AND DIFFUSERS SHALL BE THE SAME SIZE AS THE TERMINAL DEVICE NECK SIZE WHERE NO DUCT SIZE IS INDICATED.

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DAVID JOHN LITTLEFIELD
ENGINEER
No. 62951
PROFESSIONAL

MACOMB COUNTY EXECUTIVE BOARD OF COMMISSIONERS

HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

MECHANICAL NEW WORK
SECOND FLOOR PLAN

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
CHECKED BY TJO

REVISIONS
BIDS 05/12/2025

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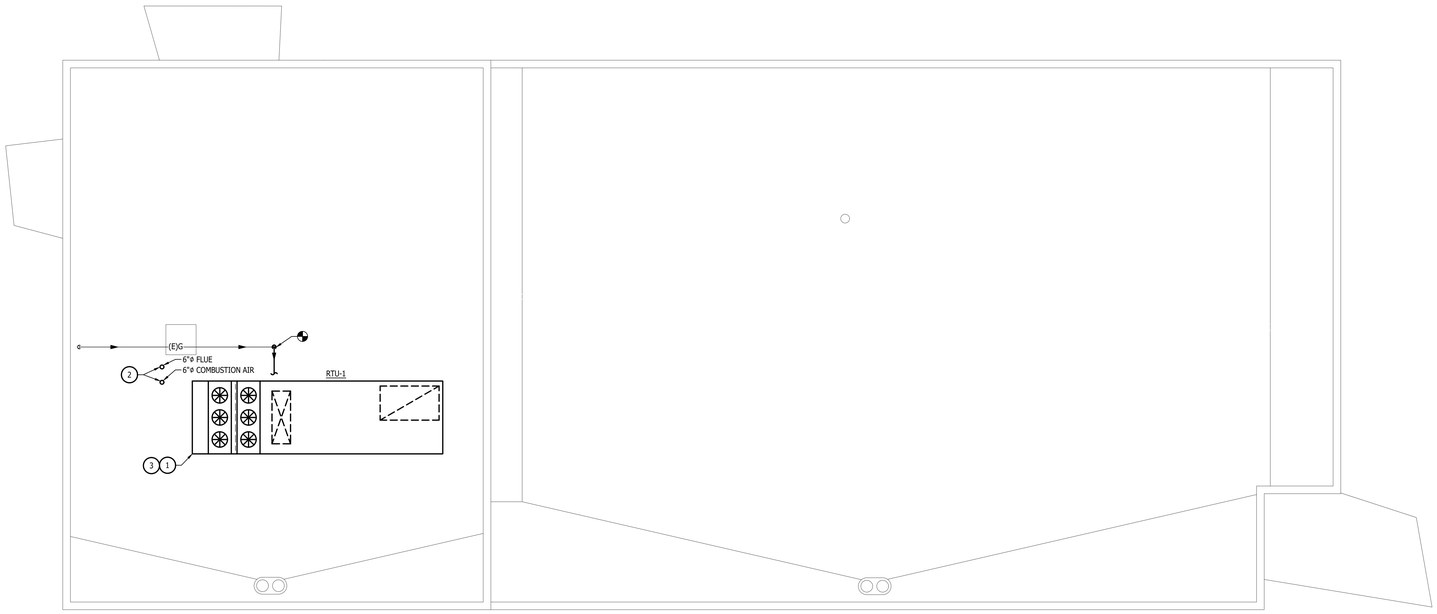

MECHANICAL NEW WORK ROOF PLAN
SCALE: 1/8" = 1'-0"

HVAC GENERAL NOTES

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B	EXCEPT FOR CHANGES AS MAY BE SPECIFICALLY APPROVED BY THE ENGINEER OF RECORD, IN ACCORDANCE WITH ALTERNATES OF OPTIONS AS STATED HEREINAFTER, ALL WORK MUST BE IN FULL ACCORDANCE WITH THE INTENT OF THE PLANS AND SPECIFICATIONS. SYSTEMS ARE TO BE COMPLETE, EFFICIENT, AND SATISFACTORY OPERATION WHEN PROJECT IS DELIVERED TO THE OWNER.
C	THE CONTRACTOR AND EACH SUBCONTRACTOR COVENANTS AND AGREES TO INDEMNIFY, DEFEND, AND HOLD HARMLESS THE CONSULTING ENGINEER, ARCHITECT, AND OWNER FROM AND AGAINST ANY LIABILITY, LOSS, DAMAGE, OR EXPENSE INCLUDING ATTORNEY'S ARISING FROM A FAILURE OR ALLEGED FAILURE ON THE PART OF THE CONTRACTOR, SUBCONTRACTORS, AND THEIR AGENTS/EMPLOYEES PROPERLY TO DISCHARGE THE OBLIGATIONS ASSUMED BY HIM/HER IN THE PERFORMANCE OF THE WORK, INCLUDING ANY ACT OR OMISSION ALLEGEDLY RESULTING IN DEATH, PERSONAL INJURY, PROPERTY DAMAGE, OR IMPROPER CONSTRUCTION PROTOCOL.
D	CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVAL FROM GOVERNING AUTHORITIES, FILE NECESSARY FORMS, PAY ALL INSPECTION FEES.
E	CONTRACTOR TO EXAMINE ALL ADJOINING WORK BEFORE COMMENCEMENT OF HIS/HER SCOPE OF WORK. REPORT ANY DISCREPANCIES TO THE CONSTRUCTION MANAGER FOR REVIEW AND APPROVAL. COORDINATE ALL WORK WITH OTHER TRADES TO ENSURE THAT INSTALLATION IS MADE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
F	PROVIDE REQUIRED CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT; DUCTWORK/PIPING SHALL NOT INTERFERE WITH ELECTRICAL EQUIPMENT CLEARANCE.
G	CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. ALL PIPING CONNECTIONS SHALL BE MINIMUM 3/4" UNLESS NOTED OTHERWISE.
H	FURNISH ADEQUATE LIABILITY INSURANCE AND BONDING DOCUMENTS AS REQUIRED BY THE OWNER.
J	ALL SUPPORT ANCHORS SECURED TO THE BOTTOM OF FLOOR SLABS SHALL BE DROP-IN OR SLEEVE ANCHOR TYPE. ALL SUPPORTING STEEL SHALL BE PROVIDED BY THE CONTRACTOR.
K	DUCTWORK/PIPING SHALL NOT BE INSTALLED IN A LOCATION THAT RESTRICTS THE ACCESS TO MECHANICAL DEVICES REQUIRING ACCESS.
L	THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL FOR THE PROPER INSTALLATION OF MECHANICAL SYSTEMS.
M	BRANCH DUCTWORK TO GRILLES, REGISTERS, AND DIFFUSERS SHALL BE THE SAME SIZE AS THE TERMINAL DEVICE NECK SIZE WHERE NO DUCT SIZE IS INDICATED.

(X) NEW WORK KEYED NOTES

1	RE-INSTALL NEW ROOFTOP UNIT ON EXISTING CURB. PROVIDE CURB ADAPTOR AS REQUIRED FOR CONNECTION INTO EXISTING DUCT MAINS. FIELD VERIFY ALL EXACT REQUIREMENTS PRIOR TO CURB FABRICATION. EXTEND AND RE-WORK EXISTING CONDENSER RAIL AS REQUIRED FOR PROPER UNIT SUPPORT. EXTEND GAS PIPING TO NEW LOCATION AS REQUIRED. PROVIDE NEW ISOLATION VALVE.
2	BOILER FLUE AND COMBUSTION AIR UP THROUGH ROOF. TERMINATE COMBUSTION AIR WITH GOOSENECK A MINIMUM OF 18" ABOVE ROOF LINE. TERMINATE FLUE PER MANUFACTURER'S RECOMMENDATIONS.
3	ROOFTOP UNIT INSTALLATION SHALL BE ON WEEKENDS/AFTER HOURS. COORDINATE LOCATION OF CRANE AND TIME OF LIFT WITH OWNER PRIOR TO INSTALLATION.

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HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

MECHANICAL NEW WORK ROOF PLAN

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
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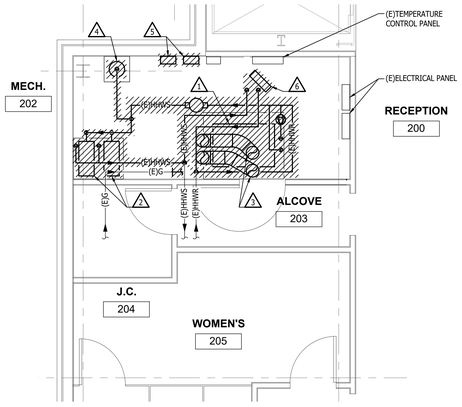


GENERAL DEMOLITION NOTES

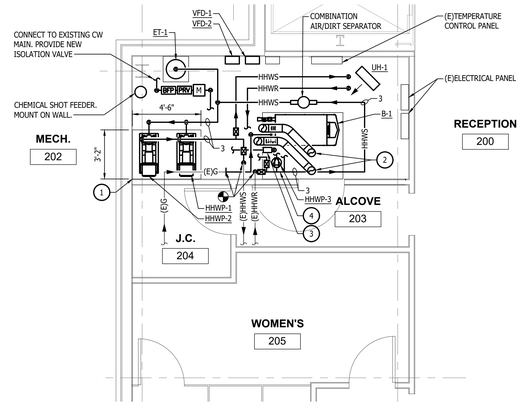
A	THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE DETERMINED BY THE NEW WORK.
B	ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
C	PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTLITIES. NOTIFY DESIGN PROFESSIONAL OF ANY INTERFERENCES OR DISCREPENCIES.
D	ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETE WITH ALL RELATED ITEMS INCLUDING HANGARS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTS.
E	THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER PROVIDED EQUIPMENT.
F	VERIFY DEPTH, SIZE, LOCATIONS, AND CONDITIONS OF EXISTING UTILITIES IN THE FIELD. INCLUDING POINTS OF CONNECTION PRIOR TO STARTING ANY WORK.
G	ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
H	ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WHERE DUCT WORK PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.

⚠ DEMOLITION KEYED NOTES

1	DISCONNECT, MAKE SAFE, AND REMOVE BOILER COMPLETE INCLUDING ALL CONTROLS, ACCESSORIES, FLUE, GAS VENT PIPING, AND GAS PIPING AS INDICATED. TEMPORARILY CAP PIPING AND PREPARE FOR NEW CONNECTION. REMOVE EXISTING MAKE-UP WATER PIPING AND BACKFLOW PREVENTER COMPLETE. REFER TO PIPING DIAGRAMS FOR FURTHER INFORMATION.
2	REMOVE BASE PUMP COMPLETE INCLUDING ALL ACCESSORIES, AND PIPING TO POINT INDICATED. REMOVE EXISTING PAD AND PATCH AND REPAIR CONCRETE BELOW AS REQUIRED. REFER TO NEW WORK PLANS FOR FURTHER INFORMATION.
3	REMOVE BOILER FLUE AND COMBUSTION AIR COMPLETE INCLUDING ALL HANGERS AND ACCESSORIES. TEMPORARILY SEAL PENETRATIONS SO THEY ARE WEATHER TIGHT. PREPARE OPENINGS FOR RE-USE.
4	REMOVE EXISTING EXPANSION TANK AND ALL ASSOCIATED PIPING AND COMPONENTS COMPLETE.
5	REMOVE EXISTING VAIRABLE FREQUENCY DRIVE AND ALL ASSOCIATED COMPONENTS COMPLETE.
6	REMOVE UNIT HEATER AND ALL ASSOCIATED COMPONENTS COMPLETE.

1 / MD2.18 — ELECTRICAL DEMOLITION ENLARGED BOILER ROOM PLAN

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



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M	BRANCH DUCTWORK TO GRILLES, REGISTERS, AND DIFFUSERS SHALL BE THE SAME SIZE AS THE TERMINAL DEVICE NECK SIZE WHERE NO DUCT SIZE IS INDICATED.

(X) NEW WORK KEYED NOTES

1	INSTALL NEW 4" HOUSEKEEPING PAD UNDER NEW BASE MOUNTED PUMPS. FIELD VERIFY ALL DIMENSIONS AND EQUIPMENT SPACING PRIOR TO INSTALLATION.
2	ROUTE 6"Ø FLUE AND COMBUSTION AIR UP THROUGH THE ROOF IN EXISTING OPENING. SEAL AROUND NEW VENTING WEATHER TIGHT. TERMINATE COMBUSTION AIR WITH GOOSENECK A MINIMUM OF 18" ABOVE ROOF. TERMINATE FLUE PER MANUFACTURER'S RECOMMENDATIONS. PVC IS ACCEPTABLE FOR COMBUSTION AIR AND SHALL NOT BE USED FOR THE FLUE. FLUE PIPING SHALL BE AL29-4C STAINLESS STEEL.
3	INSTALL CONDENSATE NEUTRALIZER KIT FROM BOILER MANUFACTURE AND DISCHARGE OVER NEAREST FLOOR DRAIN.
4	BOILER PRIMARY LOOP DE-COUPLER PIPING. REFER TO PIPING DIAGRAMS FOR FURTHER INFORMATION.

2 / M2.10 — ELECTRICAL NEW WORK ENLARGED BOILER ROOM PLAN

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

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STATE OF MICHIGAN — DAVID JOHN LITTLEFIELD — ENGINEER — No. 62951 — REGISTERED PROFESSIONAL

MACOMB COUNTY EXECUTIVE BOARD OF COMMISSIONERS

HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

ENLARGED BOILER ROOM PLANS

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
CHECKED BY TJO

REVISIONS
BIDS 05/12/2025

DATE: APRIL 01, 2025

SHEET NO.
M4.00

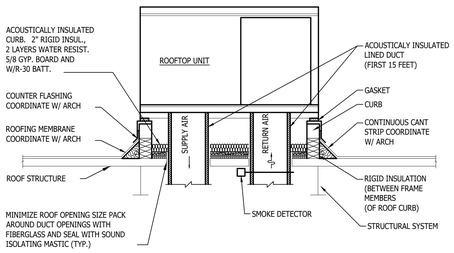
JOB NO.
242043

PACKAGED COMMERCIAL ROOFTOP UNIT SCHEDULE - (DX - GAS)

UNIT ID	TOTAL SUPPLY (CFM)	MINIMUM OA (CFM)	SUPPLY FAN					DX COOLING COIL								NATURAL GAS HEATING SECTION							POWER EXHAUST OR BAROMETRIC RELIEF	FILTER TYPE	ELECTRICAL					DISCONNECT		CURB HEIGHT (IN)	MANUFACTURER/ MODEL NO.	REMARKS
			ESP (IN WG)	FAN TYPE	DRIVE TYPE	BHP	HP	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	AIR					MIN. EFFICIENCY (EER)	REFRIGERANT TYPE	INPUT (MBH)	OUTPUT (MBH)	GAS PRESS. MIN.- MAX. (IN WG)	STAGES OR MODULATION TURNDOWN	BURNER TYPE	EAT (°F)	LAT (°F)			MOCP	MCA	FLA	VOLTS	PHASE	FURN. BY	INST. BY			
										EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)	APD (IN WG)																				
RTU-3.1	25,000	5,200	0.75	SWSI	DIRECT	29.5	30	705.7	603.7	78	64.9	56.6	56.0	0.19	10.5	R-454B	850	688.5	14-7	MODULATING	INDIRECT	56	80.4		POWER EXHAUST	2" MERV 8	450	410	397.9	208	3	MC	MC	-	TRANE / SFHPF70E	

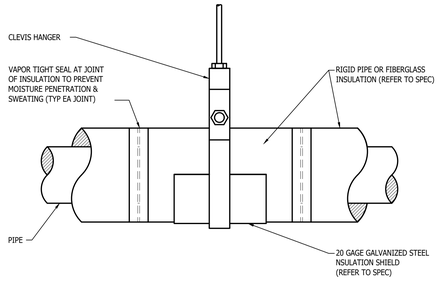
NOTES:

1. DUAL INPUT ENTHALPY CONTROL ECONOMIZER.
2. PROVIDE WITH REFRIGERATION CONTROLS ONLY. UNIT DDC CONTROLLER TO BE FIELD INSTALLED BY TCC.
3. 2" PLEATED MEDIA FILTERS.
4. PROVIDE WITH FACTORY MOUNTED DISCONNECT SWITCH.
5. REFRIGERATION COMPRESSORS SHALL BE VARIABLE SPEED SCROLL.



ROOFTOP UNIT - CURB MOUNTING DETAIL

NO SCALE



ELEVATION

BOILER SCHEDULE

UNIT ID	FUEL TYPE	GAS PRESS MIN - MAX (IN WG)	INPUT (MBH)	OUTPUT (MBH)	MIN. TURNDOWN RATIO	PRESSURE RELIEF VALVE RATING (PSIG)	WATER (25% PROPYLENE GLYCOL)				DISCONNECT			ELECTRICAL				MODEL NO.	REMARKS
							FLOW (GPM)	EWT (°F)	LWT (°F)	WPD (FT HD)	FURN. BY	INST. BY	TYPE	VOLTAGE	PHASE	FLA	MOCP		
B-1	NAT GAS	4-14	999	969	10:1	55	64	180	150	8	EC	EC	SWITCH	120	1	10	15	LOCHINVAR / KBX1000N	AL29-4C SS VENTING MATERIAL

NOTES:

1. MODEL NUMBER IS LOCHINVAR
2. PROVIDE COMBUSTION AIR INTAKE FILTER.
3. PROVIDE FLOW SWITCH.
4. CIRCULATION PUMP TO BE CONTROLLED BY BOILER CONTROL PANEL.
5. MANUFACTURER TO PROVIDE CSD-1 GAS TRAIN.
6. PROVIDE BACNET MSTP INTERFACE.
7. PROVIDE ACID NEUTRALIZER KIT.

PUMP SCHEDULE

UNIT ID	SYSTEM SERVED	TYPE	FLOW (GPM)	HEAD (FT)	MIN % EFF	VOLTAGE				DISCONNECT			STARTER			MANUFACTURER/ MODEL NO.	REMARKS
						BHP	HP	VOLTS	PHASE	FURN. BY	INST. BY	TYPE	TYPE	FURN. BY	INST. BY		
HHWP-1	HEATING HOT WATER	BASE MOUNTED	65	60	55.7	1.69	3.0	208	3	MC	MC	VFD	MC	MC		BELL AND GOSSETT / E-1510 - 1.25BC	
HHWP-2	HEATING HOT WATER	BASE MOUNTED	65	60	55.7	1.69	3.0	208	3	MC	MC	VFD	MC	MC		BELL AND GOSSETT / E-1510 - 1.25BC	
HHWP-3	B-1	INLINE	64	25	60.9	0.92	1/2	120	1	MC	MC	PACKAGED CONTROL INTERFACE	MC	MC		PROVIDED BY BOILER MANUFACTURER	

NOTES:

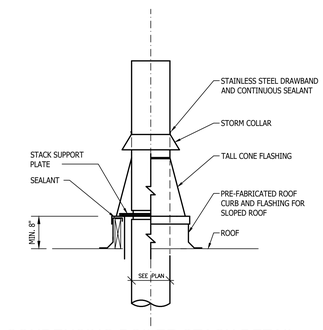
1. PERFORMANCE BASED ON WATER, UNLESS OTHERWISE INDICATED.
2. PUMPS SHALL BE NON-OVERLOADING.

HOT WATER UNIT HEATER SCHEDULE

UNIT ID	CAPACITY (MBH)	AIRFLOW (CFM)	LAT @ 60° EAT (°F)	WATER				HP	ELECTRICAL		MANUFACTURER/ MODEL NO.	REMARKS
				FLOW (GPM)	EWT (°F)	LWT (°F)	WPD (FT HD)		VOLTS	PHASE		
UH-1	33.8	730	102.7	3.4	180	160.2	0.27	1/15	115	1	RITTLING / RH-47	

NOTES:

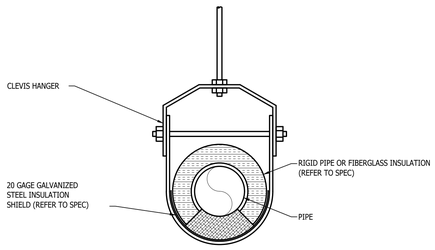
1. MANUFACTURER TO PROVIDE FACTORY MOUNTED STARTER AND DISCONNECT.
2. PROVIDE BACNET MSTP INTERFACE.



CONDENSING BOILER STACK DETAIL

NO SCALE

NOTES:
1. PROVIDE STACK SUPPORTS, GUIDES AND EXPANSION SECTIONS AS REQUIRED PER MANUFACTURER'S INSTRUCTIONS.
2. COORDINATE INSTALLATION OF STACK SUPPORTS DURING CONSTRUCTION.



SECTION

INSULATED PIPE HANGER DETAIL

NO SCALE

NOTES:

PRE-INSULATED PIPE SUPPORTS SHALL BE USED TO ALLOW PROPER ALIGNMENT OF PIPING DURING INSTALLATION. PRE-INSULATED HANGERS SHALL BE PIPE SHIELDS INCORPORATED OR APPROVED EQUAL, REFER TO SPECIFICATIONS.

EXPANSION TANK SCHEDULE

UNIT ID	SYSTEM SERVED	TYPE	MIN PSIG	MAX PSIG	MIN (°F)	MAX (°F)	SYSTEM VOLUME (GAL)	TANK VOLUME (GAL)	DIA (IN)	HEIGHT (IN)	MANUFACTURER/ MODEL NO.	REMARKS
ET-1	HEATING HOT WATER	BLADDER	60	125	40.0	180.0	-	23	16	37	BELL AND GOSSETT / B-85	

NOTES:

1. PERFORMANCE BASED ON WATER

VARIABLE FREQUENCY DRIVE SCHEDULE

UNIT ID	UNIT SERVICE	LOCATION	MOUNTING				REMARKS
			SURFACE	MOTOR CONTROL CENTER	PACKAGED WITH EQUIP.	UNISTRUT SUPPORTED	
VFD-1	HHWP-1	BOILER/ MECHANICAL	X				
VFD-2	HHWP-2	BOILER/ MECHANICAL	X				

NOTES:

1. VARIABLE SPEED DRIVE RATED HORSEPOWER SHALL MATCH THE REQUIREMENTS OF THE EQUIPMENT THAT IT SERVES. COORDINATE WITH MANUFACTURER.

WA

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HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

MECHANICAL SCHEDULES AND DETAILS

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

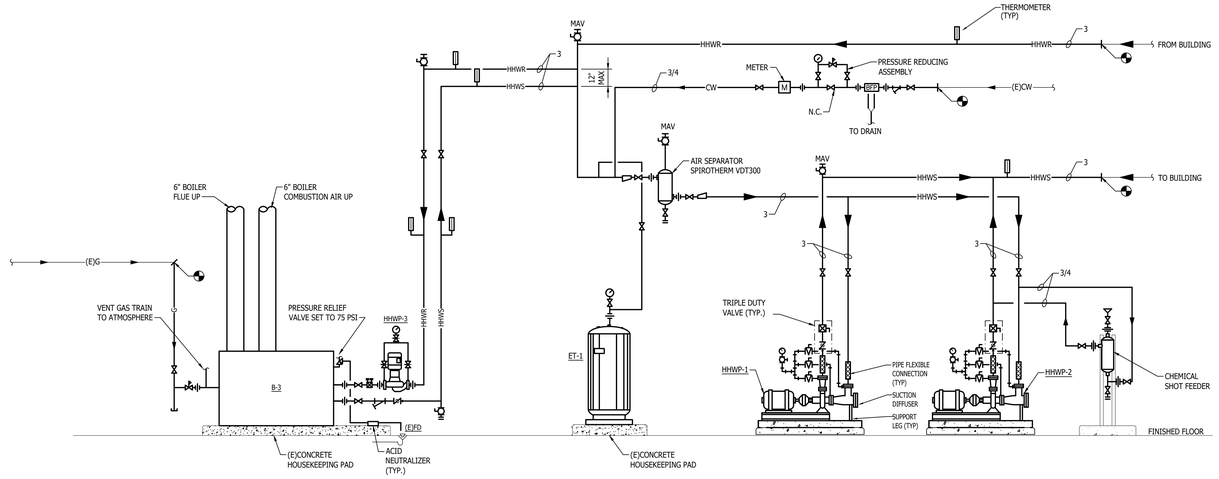
DRAWN BY TJO
CHECKED BY TJO

REVISIONS
BIDS 05/12/2025

DATE: APRIL 01, 2025

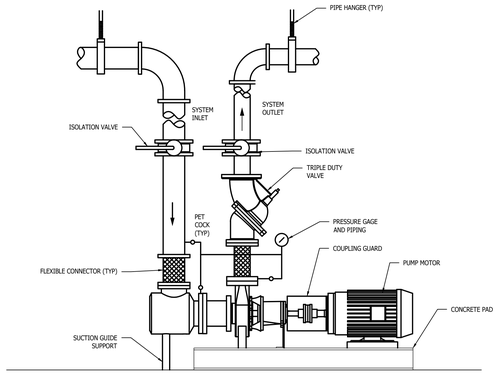
SHEET NO.
M6.00

JOB NO.
242043



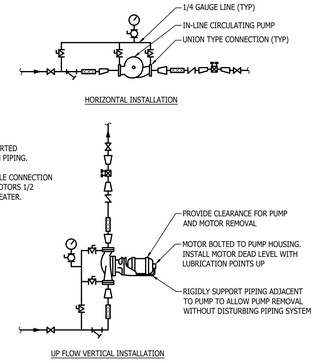
HEATING HOT WATER SYSTEM PIPING DIAGRAM

NO SCALE



TYPICAL BASE MOUNTED END SUCTION PUMP DETAIL

NO SCALE



NOTES:

1. PUMP SHALL BE SUPPORTED INDEPENDENTLY FROM PIPING.
2. PROVIDE WITH FLEXIBLE CONNECTION FOR PUMPS WITH MOTORS 1/2 HORSEPOWER AND GREATER.

IN-LINE CIRCULATING PUMP PIPING DIAGRAM

NO SCALE

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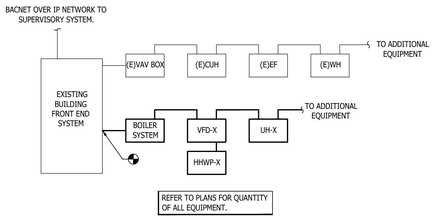


BUILDING AUTOMATION SYSTEM RISER DIAGRAM

NO SCALE

BUILDING AUTOMATION SYSTEM NOTES:

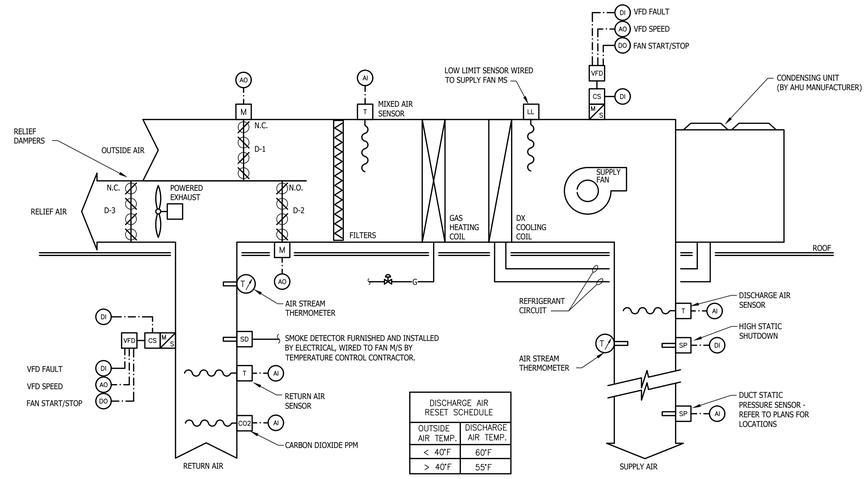
1. CONFIGURATION AND ORDER OF CONTROLLER CONNECTION IS FOR REPRESENTATION PURPOSES ONLY. UPDATE CONTROL SYSTEM DRAWINGS TO REFLECT ACTUAL AS-BUILT CONDITIONS, INCLUDING ORDER IN WHICH CONTROLLERS ARE CONNECTED WITHIN THE NETWORK.

BUILDING AUTOMATION SYSTEM FRONT END SYSTEM REQUIREMENTS

1. INTEGRATE MECHANICAL EQUIPMENT INTO THE EXISTING AUTOMATED LOGIC SUPERVISORY SYSTEM, INCLUDING GRAPHICS. EACH UNIT SHALL DISPLAY PERTINENT INFORMATION FOR CONTROL AND TROUBLE SHOOTING, INCLUDING:

   A) SPACE TEMPERATURE
   B) SPACE TEMPERATURE SETPOINT
   C) UNIT STATUS
   D) HIGH AND LOW REFRIGERANT PRESSURE ALARMS
   E) HEATING HOT WATER VALVE COMMAND
   F) OCCUPIED/UNOCCUPIED COMMAND
   G) MODE OF OPERATION

THE ONLY ACCEPTABLE CONTROLS CONTRACTOR IS METRO CONTROLS.



DISCHARGE AIR RESET SCHEDULE

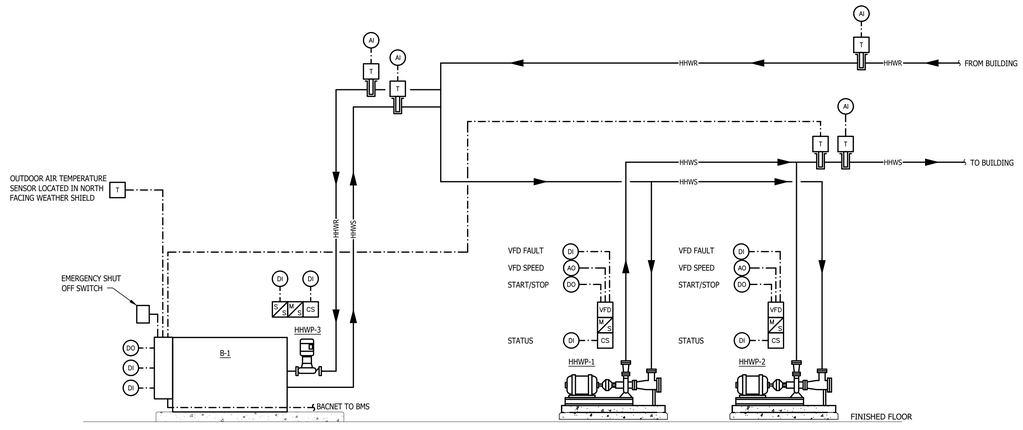
OUTSIDE AIR TEMP.	DISCHARGE AIR TEMP.
< 40°F	60°F
> 40°F	55°F

VAV ROOFTOP UNIT CONTROL DIAGRAM

NO SCALE (TYP. OF RTU-1)

VAV ROOFTOP UNIT SEQUENCE OF OPERATIONS:
NOTE: ALL SETPOINTS AND TIME INTERVALS SHALL BE ADJUSTABLE BY THE SYSTEM OPERATOR. UNIT SHALL BE PROVIDED WITH TERMINAL STRIP. CONTROLLER AND CONTROL COMPONENTS BY TEMPERATURE CONTROLS CONTRACTOR. REFRIGERATION SAFETIES BY UNIT MANUFACTURER. ONLY ALLOWED CONTROLS CONTRACTOR IS METRO CONTROLS. INTEGRATE INTO OWNER'S AUTOMATED LOGIC CONTROL SYSTEM.

1. WITH THE SUPPLY FAN'S VFD HAND/OFF/AUTO SWITCH IN THE "AUTO" POSITION, THE SUPPLY FAN SHALL BE AUTOMATICALLY STARTED AND STOPPED WITH THE DDC SYSTEM OCCUPANCY SCHEDULE. SUPPLY FAN SHALL ALSO BE ENERGIZED WHENEVER THE HOOD EXHAUST FAN IS ALSO ENERGIZED VIA WALL SWITCH OR HEAT SENSOR.
2. OCCUPIED MODE: WHEN THE DDC SYSTEM ENERGIZES THE SUPPLY FAN, THE FAN SHALL RUN CONTINUOUSLY. THE RETURN, RELIEF AND RETURN DAMPERS WILL MODULATE TO MAINTAIN MINIMUM OUTSIDE AIRFLOW AS DETERMINED BY THE DDC SYSTEM AND CO2 SENSOR.
3. THE DDC SYSTEM SHALL MONITOR THE SPACE CO2 (THROUGH THE RETURN AIR CO2 SENSOR) AND MODULATE THE MIXED AIR DAMPERS TO MAINTAIN A MAXIMUM LEVEL OF 1000 PPM, SUBJECT TO A MIX AIR TEMPERATURE LOW LIMIT TEMPERATURE OF 45°F.
4. THE SUPPLY FAN WILL PROVE FLOW TO THE DDC SYSTEM WITH ITS CURRENT SENSING SWITCH. IF THE FAN FAILS, THE SYSTEM WILL BE DE-ENERGIZED AND AN ALARM WILL BE SENT TO THE DDC SYSTEM.
5. THE SUPPLY FAN VSD SHALL BE MODULATED BY THE REMOTE SUPPLY DUCT STATIC PRESSURE SENSOR TO MAINTAIN A CONSTANT STATIC PRESSURE SETPOINT THAT IS DETERMINED BY THE TEST AND BALANCE AGENCY. IF A CONTROL SIGNAL IS LOST, THE FAN'S VFD WILL OPERATE AT 50% AND AN ALARM WILL BE SENT TO THE DDC SYSTEM.
6. THE DISCHARGE HIGH STATIC PRESSURE SENSOR (LOCATED AT THE RTU) SHALL MODULATE THE SUPPLY FAN VFD TO PREVENT THE DISCHARGE STATIC PRESSURE FROM EXCEEDING THE HIGH LIMIT SETPOINT OF 4.0" W.G. IF THE DISCHARGE HIGH STATIC PRESSURE SENSOR REACHES 5.0" W.G., THE SUPPLY FAN SHALL BE DE-ENERGIZED.
7. THE DISCHARGE AIR TEMPERATURE SENSOR SHALL MODULATE THE DX STAGES OF COOLING, MIXED AIR DAMPERS (D-1, D-2, D-3), AND THE STAGES OF AS HEAT TO MAINTAIN THE DISCHARGE AIR TEMPERATURE.
8. THE POWERED EXHAUST FAN SHALL BE ENERGIZED WHENEVER THE SPACE STATIC PRESSURE IS OVER 0.1"w.c. THE EXHAUST FAN'S VSD SHALL MODULATE THE FAN TO MAINTAIN A MAXIMUM PRESSURIZATION OF 0.1" w.c.
9. ECONOMIZER MODE: WHEN THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE, DDC SHALL MODULATE THE MIXED AIR DAMPERS (D-1, D-2, D-3) AND DX STAGES OF COOLING TO MAINTAIN THE DISCHARGE AIR TEMPERATURE WHILE MAINTAINING THE MINIMUM OUTSIDE AIRFLOW. WHEN THE OUTSIDE AIR TEMPERATURE IS GREATER THAN THE RETURN AIR TEMPERATURE, DDC SHALL MODULATE THE MIXED AIR DAMPERS TO MAINTAIN THE MINIMUM OUTSIDE AIRFLOW.
10. UNOCCUPIED MODE: IF ANY OF THE SPACE TEMPERATURE SENSORS DROPS BELOW 60°F, THE SUPPLY AND RETURN FANS SHALL BE ENERGIZED, THE OUTSIDE AND RELIEF DAMPERS SHALL REMAIN CLOSED, THE RETURN DAMPER SHALL BE FULLY OPENED AND STAGES OF GAS HEAT SHALL FIRE. THE SUPPLY/RETURN FAN OFFSET SHALL BE ZERO DURING UNOCCUPIED OPERATION. AFTER ALL OF THE SPACES HAVE REACHED 63°F (ADJ), THE UNIT SHALL BE DE-ENERGIZED.
11. IF THE FREEZE-STAT SETPOINT IS REACHED (35°F OR BELOW), THEN THE SUPPLY AND RETURN FANS SHALL BE DE-ENERGIZED. IF THE DUCT MOUNTED SMOKE DETECTORS DETECT SMOKE, THEN THE SUPPLY AND RETURN FANS SHALL BE DE-ENERGIZED.
12. WHEN THE SUPPLY FAN IS DE-ENERGIZED, THE OUTSIDE AND RELIEF DAMPERS SHALL BE CLOSED. THE RETURN AIR DAMPER SHALL BE OPEN.
13. POINTS THAT SHALL BE GRAPHICALLY SHOWN: FAN STATUS, DUCT PRESSURE, DUCT PRESSURE SETPOINT, DISCHARGE AIR TEMPERATURE, DISCHARGE AIR TEMPERATURE SETPOINT, COOLING STAGES, HEATING HOT WATER CONTROL VALVE POSITION.
14. O2 CONTROL: THE SPACE CO2 SENSOR WILL SUPPLY A PPM READING TO THE UNIT CONTROLLER. THE UNIT CONTROLLER WILL OPEN THE OA DAMPER TO PROVIDE MORE VENTILATION AIR AS REQUIRED TO MAINTAIN A DEADBAND OF 700 PPM(ADJ.).



HEATING HOT WATER SYSTEM CONTROL DIAGRAM

NO SCALE

HEATING HOT WATER SUPPLY (HHWS) RESET SCHEDULE

OUTSIDE AIR TEMP.	HHWS TEMPERATURE
≤ 50°F	110°F
≤ 25°F	160°F
< 10F	180°F

HEATING HOT WATER SYSTEM SEQUENCE OF OPERATIONS:
NOTE: ALL SETPOINTS AND TIME INTERVALS SHALL BE ADJUSTABLE BY THE SYSTEM OPERATOR. ONLY ACCEPTABLE CONTROLS CONTRACTOR IS METRO CONTROLS. INTEGRATE INTO OWNER'S AUTOMATED LOGIC CONTROL SYSTEM.

HEATING HOT WATER PLANT MANAGER
1. THE BUILDING MANAGEMENT SYSTEM (BMS) SHALL INCLUDE A HEATING HOT WATER PLANT MANAGER TO CONTROL THE SECONDARY HEATING HOT WATER PUMPS AND STAGE THE BOILERS IN A LEAD/LAG OPERATION.
2. THE HEATING HOT WATER SYSTEM SHALL BE ENABLED TO RUN WHENEVER THE OUTSIDE AIR TEMPERATURE IS LESS THAN 60 DEG. F.
3. TO PREVENT SHORT CYCLING, THE HEATING HOT WATER SYSTEM SHALL RUN FOR AND BE OFF FOR A MINIMUM ADJUSTABLE TIME (BOTH TIMES USER ADJUSTABLE).

SECONDARY PUMP CONTROL
1. WHEN THE HEATING HOT WATER SYSTEM IS ENABLED, THE LEAD HEATING HOT WATER PUMP SHALL BE ENABLED.
3. EACH PUMP WILL PROVE OPERATION TO THE BMS WITH ITS CURRENT SWITCH. IF A PUMP FAILS, AN ALARM WILL BE SENT TO THE BMS AND THE LAG PUMP WILL BE ACTIVATED (IF NOT OPERATING).
4. THE PLANT MANAGER SHALL ALTERNATE PUMP OPERATION BASED ON RUN TIME HOURS OR AT THE BEGINNING OF EACH MONTH.
5. THE CONTROLLER SHALL MEASURE THE HEATING HOT WATER RETURN WATER TEMPERATURE (ADJ.) AND MODULATE THE SECONDARY HEATING HOT WATER PUMP VFDS IN SEQUENCE TO MAINTAIN THE HEATING HOT WATER RETURN WATER SETPOINT OF 40°F SUPPLY/RETURN WATER DIFFERENTIAL (ADJ.). ALL SETPOINTS SHALL BE FIELD ADJUSTED DURING TESTING AND BALANCING TO MEET THE REQUIREMENTS OF THE ACTUAL FIELD CONDITIONS.
6. THE SECONDARY HEATING HOT WATER PUMPS SHALL STAGE ON AND RUN TO MAINTAIN RETURN WATER TEMPERATURE SETPOINT AS FOLLOWS:
   6.1. THE CONTROLLER SHALL MODULATE THE LEAD PUMP VFD TO MAINTAIN SETPOINT.
   6.2. IF THE LEAD PUMP SPEED IS GREATER THAN 90% (ADJUSTABLE), THE LAG PUMP SHALL STAGE ON.
   6.3. THE LAG PUMP SHALL RAMP UP TO MATCH THE LEAD PUMP SPEED AND THEN RUN IN UNISON WITH THE LEAD PUMP TO MAINTAIN SETPOINT.
7. ON RISING HEATING HOT WATER RETURN TEMPERATURE, THE PUMPS SHALL STAGE OFF AS FOLLOWS:
   7.1. IF THE SECONDARY HEATING HOT WATER PUMPS SPEEDS THEN DROPS BACK TO 60% (ADJUSTABLE) BELOW SETPOINT, THE LAG PUMP SHALL STAGE OFF.
   7.2. THE LEAD PUMP SHALL CONTINUE TO RUN TO MAINTAIN SETPOINT.

BOILER CONTROL:
1. WHEN THE BOILER IS STAGED ON BY THE PLANT MANAGER, THE BOILER'S INTERNAL CONTROLS SHALL START THE ASSOCIATED PRIMARY HEATING HOT WATER PUMP. THE DDC SYSTEM SHALL MONITOR PRIMARY PUMP STATUS THROUGH CURRENT SWITCH.

UPON PROOF OF FLOW, THE BOILER'S INTERNAL CONTROLS WILL START THE BOILER AND ENERGIZE THE STAGES OF HEATING TO MAINTAIN THE BOILER DISCHARGE TEMPERATURE SETPOINT (SYSTEM SUPPLY TEMPERATURE SETPOINT). THE SUPPLY SETPOINT SHALL ADJUST BASED ON THE SYSTEM RESET SCHEDULE.

MONITOR AND ALARM:
1. THE BMS SHALL MONITOR AND GRAPHICALLY SHOW, AT A MINIMUM, THE FOLLOWING POINTS. ALL POINTS SHALL BE ALARMED WHEN OUT OF RANGE:
   1.1. BOILER STATUS AND STAGING
   1.2. BOILER RUN TIMES AND START/STOPS
   1.3. BOILER ALARM
   1.4. BOILER ENTERING AND LEAVING WATER TEMPERATURES (HIGH AND LOW ALARMS)
   1.5. BOILER WATER SYSTEM SUPPLY AND RETURN WATER TEMPERATURES (HIGH AND LOW ALARMS)
   1.6. SECONDARY PUMP SPEED
   1.7. ALL PUMPS STATUS (ALARMS WHEN SCHEDULED ON, BUT NOT OPERATING)
2. DATA TRENDS SHALL BE ESTABLISHED TO RECORD AND TREND ALL POINTS INDICATED ABOVE.
3. ADDITIONAL BOILER INFORMATION AVAILABLE THROUGH THE BACNET INTEGRATION SHALL BE ACCESSIBLE THROUGH THE BMS FRONT END SYSTEM, BUT DOES NOT NEED TO BE PRESENTED ON THE GRAPHIC DISPLAY.

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TEMPERATURE CONTROLS

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LIGHTING SYMBOL LIST

SYMBOL	DESCRIPTION
	LIGHT FIXTURE – CEILING/GRID MOUNT
	LIGHT FIXTURE – INTERIOR WALL MOUNT LINEAR
	LIGHT FIXTURE – DOWNLIGHT WITH WALLWASH DIST.
	LIGHT FIXTURE – INTERIOR WALL SCONCE
	LIGHT FIXTURE – INTERIOR SURFACE MOUNT
	LIGHT FIXTURE – INTERIOR WALL MOUNTED
	LIGHT FIXTURE – INTERIOR PENDANT MOUNT
	LIGHT FIXTURE – INTERIOR PENDANT MOUNT CYLINDER
	TRACK AND TRACK MOUNTED LIGHT FIXTURES
	EXIT LIGHT – CEILING MOUNTED – ARROWS AS INDICATED ON PLAN (SHADED AREA INDICATES FACE(S) OF FIXTURE)
	EXIT LIGHT – WALL MOUNTED – ARROWS AS INDICATED ON PLAN (SHADED AREA INDICATES FACE(S) OF FIXTURE)
	EMERGENCY LIGHT FIXTURE – EMERGENCY BATTERY UNIT
	EMERGENCY LIGHT FIXTURE – BATTERY UNIT/EXIT SIGN
	LIGHT FIXTURE – EXTERIOR POLE MOUNT TYPE
	LIGHT FIXTURE – EXTERIOR WALL MOUNT TYPE
	LIGHT FIXTURE – EXTERIOR POST TOP TYPE
	LIGHT FIXTURE – EXTERIOR BOLLARD TYPE

NOTES:
1. LIGHTING SYMBOLS AS INDICATED ON PLANS ARE NOT DRAWN TO SCALE UNLESS NOTED OTHERWISE.

LIGHTING CONTROLS LEGEND

SYMBOL	DESCRIPTION
$	SWITCH SINGLE POLE
$O	OCCUPANCY SENSOR SWITCH
$V	VACANCY SENSOR SWITCH
$VD	VACANCY DIMMER SENSOR SWITCH
$D	LOW VOLTAGE DIMMER SWITCH
OS	CEILING MOUNTED OCCUPANCY SENSOR
VS	CEILING MOUNTED VACANCY SENSOR
$3	SWITCH THREE-WAY
$K	SINGLE POLE KEY SWITCH

POWER SYMBOL LIST

SYMBOL	DESCRIPTION
	CONDUIT DOWN
	CONDUIT UP
C	CONTACTOR
	DISCONNECT SWITCH – NON FUSED
	DISCONNECT SWITCH – FUSED
	DISCONNECT SWITCH – COMB. MOTOR STARTER
	ELECTRICAL PANEL – 208/240 VOLTS
	ELECTRICAL PANEL – 480 VOLTS
	GROUNDING ROD
	GROUND
	GROUNDING BAR
J	JUNCTION BOX
J	JUNCTION BOX WITH HARDWIRED CONNECTION
M	METER
	MOTOR – SINGLE PHASE
	MOTOR – THREE PHASE
$M	MOTOR RATED SWITCH
	POWER RECEPTACLE – SIMPLEX TYPE
	POWER RECEPTACLE – DUPLEX TYPE
	POWER RECEPTACLE – DUPLEX 6" ABOVE COUNTER
USB	POWER RECEPTACLE – USB/DUPLEX COMBO. DEVICE
	POWER RECEPTACLE – QUADRUPLEX TYPE
	POWER RECEPTACLE – RECESSED FLOOR TYPE
	POWER RECEPTACLE – SPECIALTY TYPE
	CORD REEL
SPD	SURGE PROTECTION DEVICE
TC	TIME CLOCK
T	TRANSFORMER (REFER TO SCHEDULES FOR INFO)
VSD	VARIABLE SPEED DRIVE

NOTES:
1. ALL DEVICE RATINGS/SIZES SHALL BE COORDINATED WITH PLANS AND SCHEDULES.

AUXILIARY SYST. SYMBOL LIST

SYMBOL	DESCRIPTION
	CAMERA
CR	CARD READER
	COMMUNICATIONS DEVICE – 6" ABOVE COUNTER
	COMMUNICATIONS DEVICE – FLOOR
	COMMUNICATIONS DEVICE – WALL
DH	MAGNETIC DOOR HOLDER
	PUSH BUTTON
S	SPEAKER
	WALL CLOCK – SINGLE FACE
	WALL CLOCK – DOUBLE FACE
S	WALL CLOCK AND SPEAKER UNIT

NOTES:
1. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR BOX AND CONDUIT FOR ALL DEVICES INDICATED.
2. LOW VOLTAGE CONTRACTOR SHALL PROVIDE EXACT SPECIFICATIONS AND LOCATIONS OF ALL DEVICES.

FIRE ALARM SYMBOL LIST

SYMBOL	DESCRIPTION
S	DETECTION DEVICE
S	DETECTION DEVICE – DUCT MOUNTED
FS	DETECTION DEVICE – FLOW SWITCH
TS	DETECTION DEVICE – TAMPER SWITCH
FAA	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FD	FIRE DEPARTMENT COMMUNICATION OUTLET
F	MANUAL DEVICE – PULL STATION
F	NOTIFICATION DEVICE – WALL MOUNTED
F	NOTIFICATION DEVICE – CEILING MOUNTED

NOTES:
1. DRAWINGS INDICATE DESIGN INTENT ONLY, FINAL LOCATIONS AND DEVICE SPECIFICATIONS SHALL BE PROVIDED BY FIRE ALARM MANUFACTURER. REFER TO PROJECT SPECIFICATIONS FOR APPROVED MANUFACTURERS.

ELECTRICAL ABBREVIATIONS

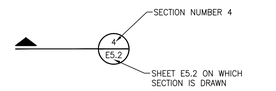
ABBREV.	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
A	AMPERE
AF	AMPERE FUSE/AMPERE FRAME
AWG	AMERICAN WIRE GAUGE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AIC	AVAILABLE INTERRUPTING CURRENT (AMPS)
C	CONDUIT OR CEILING MOUNTED
CB	CIRCUIT BREAKER
CU	COPPER
CT	CURRENT TRANSFORMER
DIA	DIAMETER
DISC	DISCONNECT
EMT	ELECTRICAL METALLIC TUBING
EWC	ELECTRIC WATER COOLER
EPO	EMERGENCY POWER OFF
(E)	EXISTING ELECTRICAL EQUIPMENT OR WORK
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
F	FUSE
G/GRD	GROUND
GFCI/GFI	GROUND FAULT CIRCUIT INTERRUPTER
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
IG	ISOLATED GROUND
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
LP	LIGHTING PANEL
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUG ONLY
MAX	MAXIMUM
MIN	MINIMUM
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
N/NEU	NEUTRAL
NF	NON-FUSIBLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NIC	NOT IN CONTRACT
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
PH. OR ø	PHASE
P	POLE
PF	POWER FACTOR
PVC	POLYVINYL CHOLRIDE (PLASTIC)
(R)	RELOCATED EXISTING ELECTRICAL EQUIPMENT
(RR)	REMOVE AND REINSTALL
RMC	RIGID METALLIC CONDUIT
RP	RECEPTACLE PANEL
SPEC/SPECS	SPECIFICATIONS
TBB	TELEPHONE BACKBOARD
TYP.	TYPICAL
UC	UNDER COUNTER
UL	UNDERWRITERS LABORATORIES
UPS	UNINTERRUPTIBLE POWER SUPPLY
USB	UNIVERSAL SERIAL BUS
V	VOLT
VA	VOLT AMPERE
W	WATT
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER

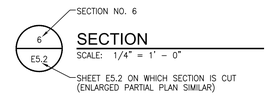
DRAWING INDEX

SHT NO	DESCRIPTION
E0.00	ELECTRICAL GENERAL INFORMATION AND LIGHTING SCHEDULE
ED1.10	ELECTRICAL DEMOLITION FIRST FLOOR PLAN
ED2.10	ELECTRICAL DEMOLITION SECOND FLOOR PLAN
ED3.10	ELECTRICAL DEMOLITION ROOF PLAN
E1.10	ELECTRICAL NEW WORK FIRST FLOOR PLAN
E2.10	ELECTRICAL NEW WORK SECOND FLOOR PLAN
E3.10	ELECTRICAL NEW WORK ROOF PLAN
E4.00	ELECTRICAL DEMOLITION & NEW WORK ENLARGED BOILER ROOM PLANS
E5.00	ELECTRICAL DETAILS AND PANEL SCHEDULES
E7.00	ELECTRICAL ONE-LINE DIAGRAM

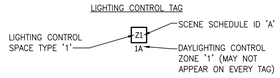
DRAWING NOTATION

SYMBOL	DESCRIPTION
LA	LIGHTING FIXTURE TAG
1	CONSTRUCTION KEY NOTE NUMBER 1
1	DEMOLITION KEY NOTE NUMBER 1
1	FEEDER SIZE TAG (REFER TO FEEDER SCHEDULE ON THIS SHEET)
EF 1	EQUIPMENT DESIGNATION, (I.E. EXHAUST FAN NUMBER 1)
	EXISTING DEVICES OR EQUIPMENT
	NEW OR MODIFIED DEVICES OR EQUIPMENT
	NEW OR MODIFIED UNDERGROUND WIRING
	EXISTING SYSTEM COMPONENT TO BE REMOVED





LIGHTING CONTROL TAG



APPLICABLE CODES AND REGULATIONS

YEAR	CODE
2015	MICHIGAN BUILDING CODE
2015	MICHIGAN ENERGY CODE
2023	MICHIGAN ELECTRICAL CODE RULES, PART 8
2021	NATIONAL ELECTRICAL CODE (NFPA 70)
2013	NFPA 20
2013	NFPA 72
2012	NFPA 101
2013	NFPA 110
2009	ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS & FACILITIES

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STATE OF MICHIGAN – DAVID JOHN LITTLEFIELD – ENGINEER – No. 62951 – PROFESSIONAL ENGINEER

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GENERAL DEMOLITION NOTES	
A	THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE DETERMINED BY THE NEW WORK.
B	ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
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F	VERIFY DEPTH, SIZE, LOCATIONS, AND CONDITIONS OF EXISTING UTILITIES IN THE FIELD. INCLUDING POINTS OF CONNECTION PRIOR TO STARTING ANY WORK.
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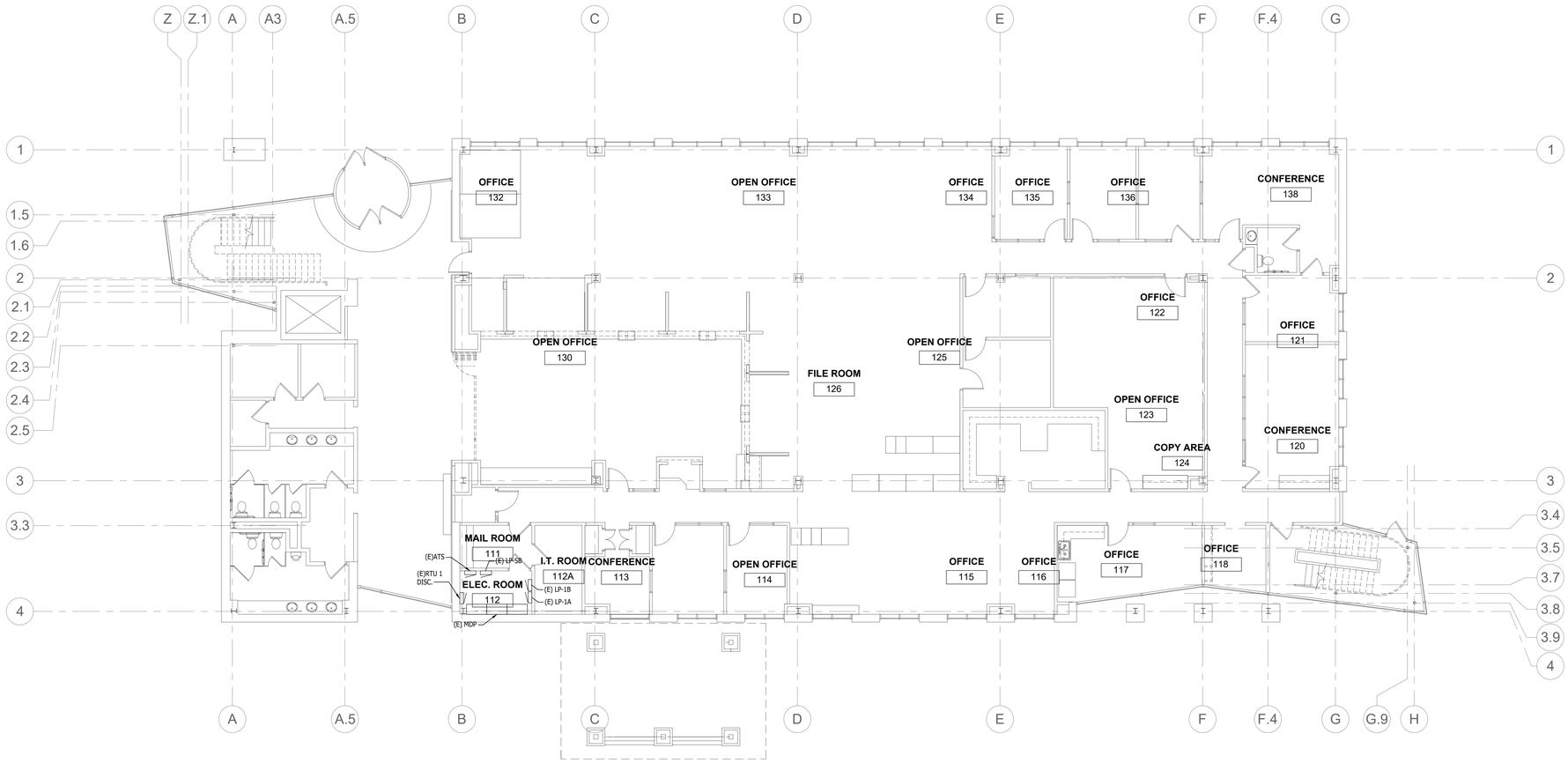

ELECTRICAL DEMOLITION FIRST FLOOR PLAN
SCALE: 1/8" = 1'-0"

WAKELY ASSOCIATES, INC.
ARCHITECTS

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STATE OF MICHIGAN
DAVID JOHN LITTLEFIELD
ENGINEER
No. 62921
LICENSED PROFESSIONAL

MACOMB COUNTY EXECUTIVE BOARD OF COMMISSIONERS

HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

ELECTRICAL DEMOLITION
FIRST FLOOR PLAN

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
CHECKED BY TJO

REVISIONS
BIDS 05/12/2025

DATE: APRIL 01, 2025

SHEET NO.
ED1.10

JOB NO.
242043

GENERAL DEMOLITION NOTES

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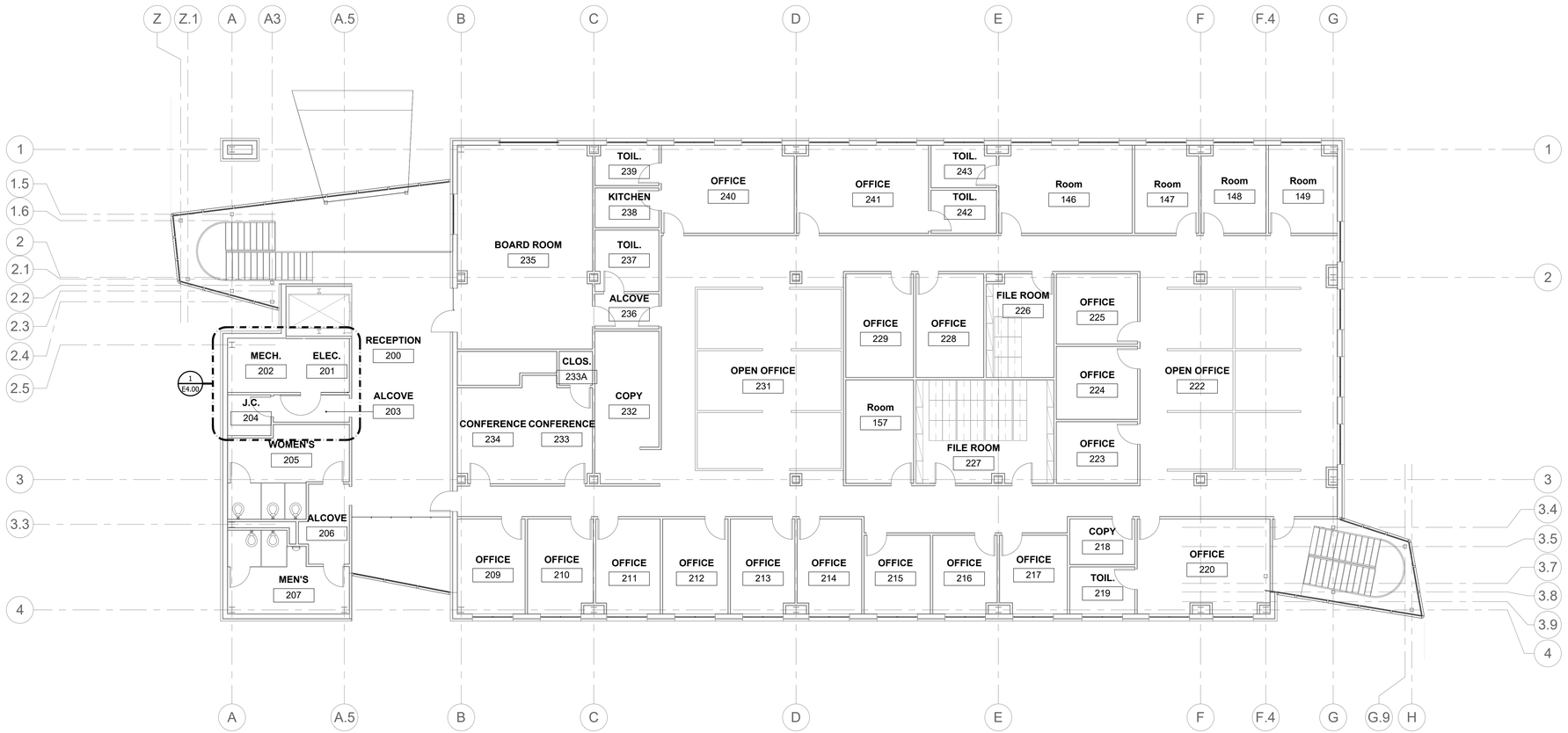

ELECTRICAL DEMOLITION SECOND FLOOR PLAN

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

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ARCHITECTS

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HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

ELECTRICAL DEMOLITION
SECOND FLOOR PLAN

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
CHECKED BY TJO

REVISIONS

BIDS	05/12/2025

DATE: APRIL 01, 2025

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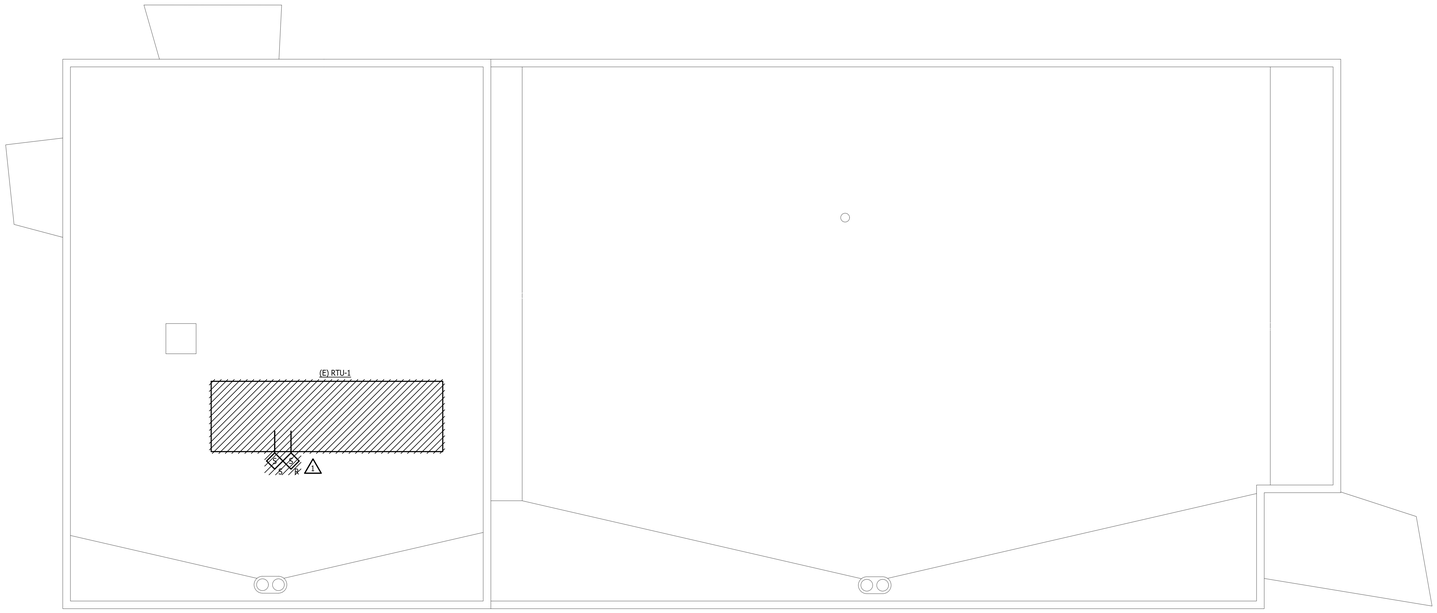
⚠ DEMOLITION KEYED NOTES

1	DISCONNECT EXISTING FIRE ALARM DEVICE. PROTECT FIRE ALARM DEVICE FOR RE-INSTALLATION. REFER TO NEW WORK PLANS FOR FURTHER INFORMATION.



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

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PROFESSIONAL

MACOMB COUNTY EXECUTIVE BOARD OF COMMISSIONERS

HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

ELECTRICAL DEMOLITION ROOF PLAN

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
CHECKED BY TJO

REVISIONS
BIDS 05/12/2025

DATE: APRIL 01, 2025

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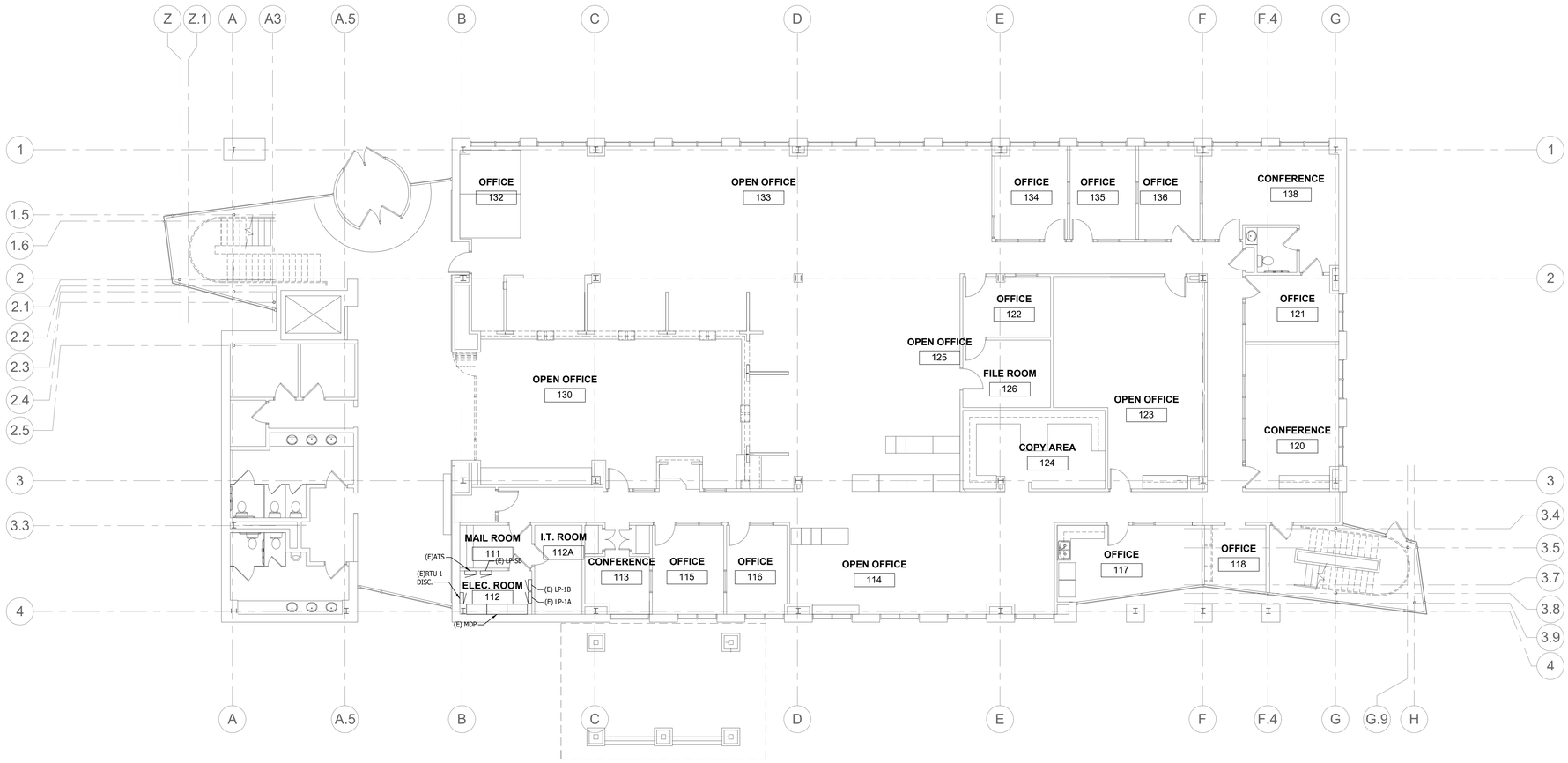

ELECTRICAL NEW WORK FIRST FLOOR PLAN
SCALE: 1/8" = 1'-0"

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HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

ELECTRICAL NEW WORK
FIRST FLOOR PLAN

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
CHECKED BY TJO

REVISIONS
BIDS 05/12/2025

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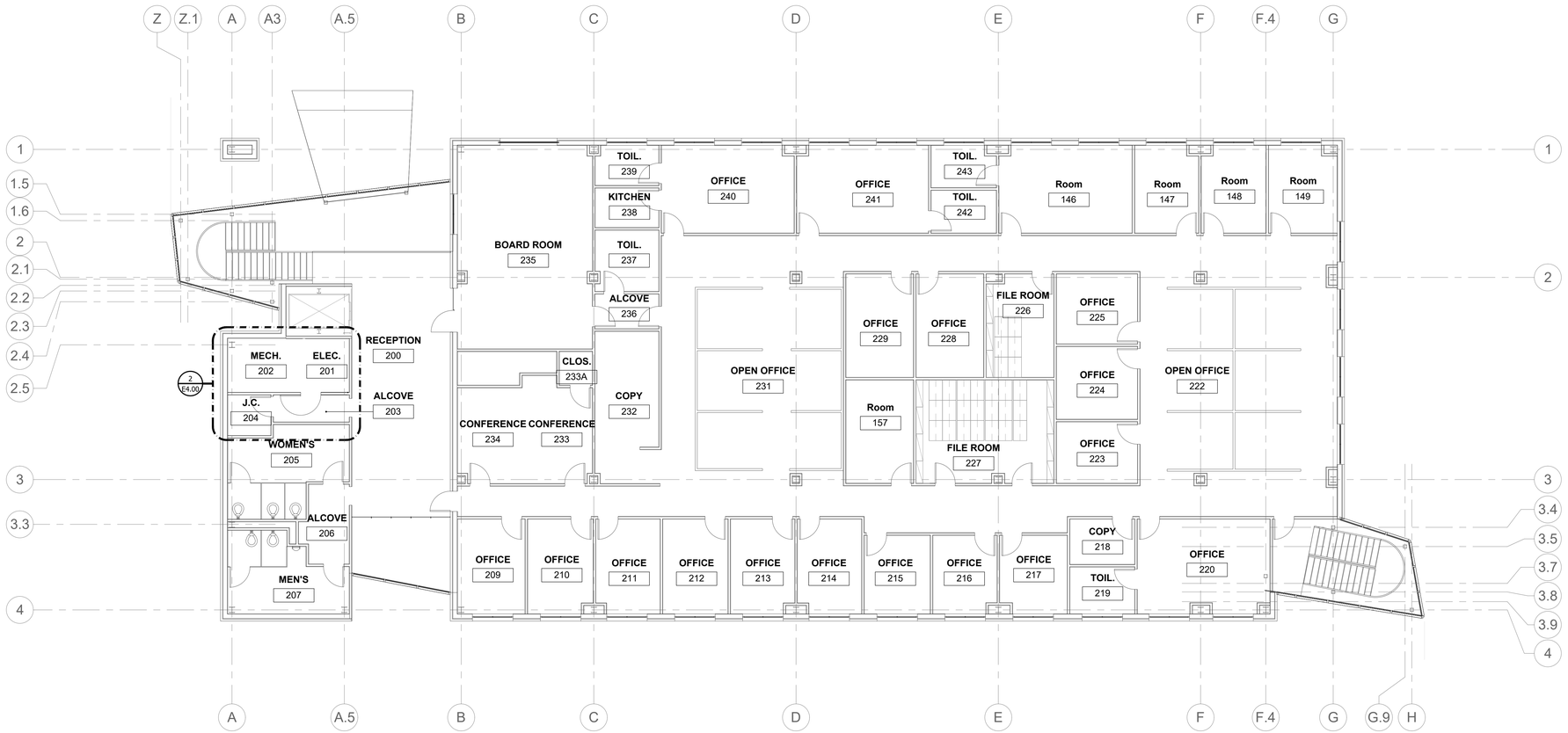

ELECTRICAL NEW WORK SECOND FLOOR PLAN

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

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HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

ELECTRICAL NEW WORK
SECOND FLOOR PLAN

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
CHECKED BY TJO

REVISIONS

BIDS	05/12/2025

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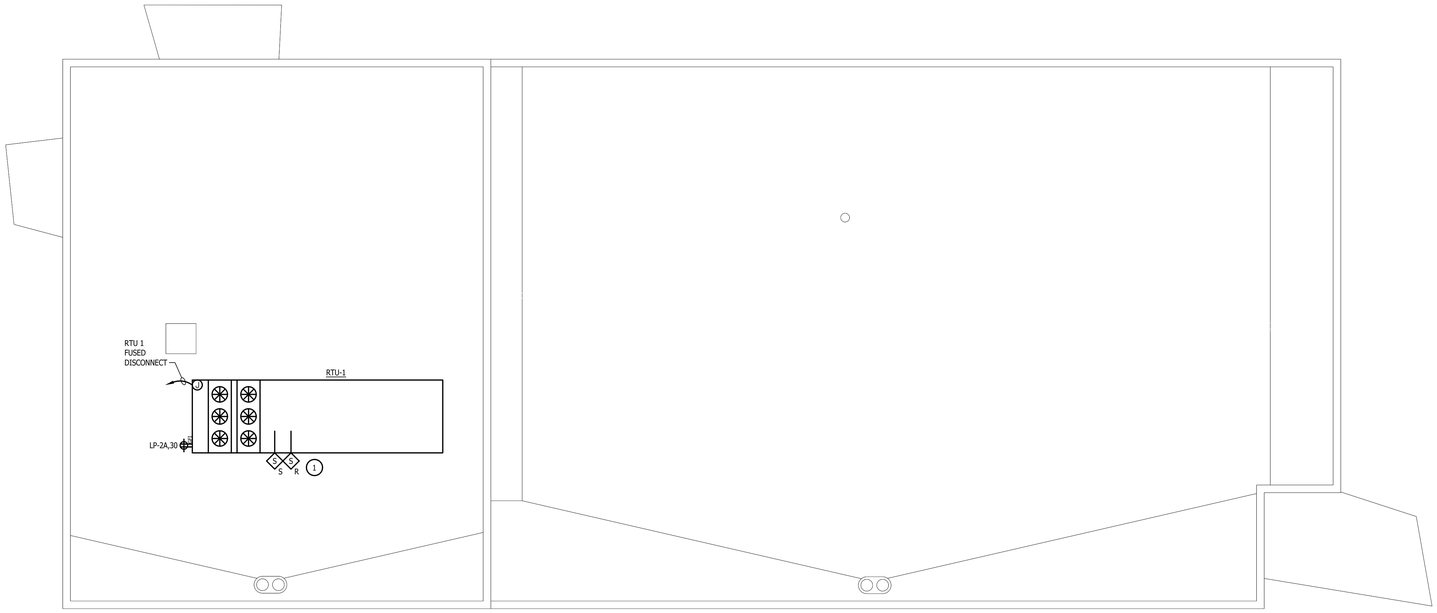
(X)	NEW WORK KEYED NOTES
1	RE-INSTALL FIRE ALARM DEVICES REMOVED DURING DEMOLITION WORK.



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

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HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

ELECTRICAL NEW WORK
ROOF PLAN

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
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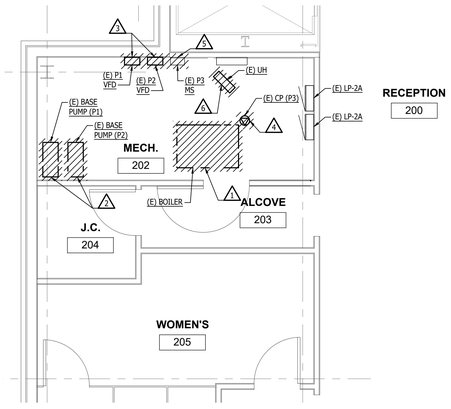

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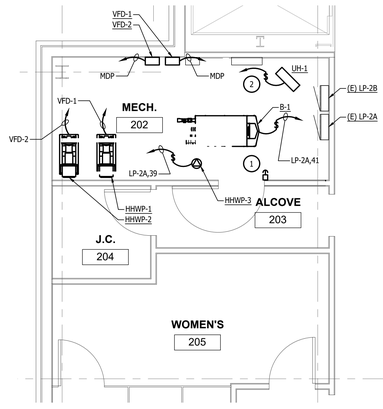
⚠ DEMOLITION KEYED NOTES

1	DISCONNECT EXISTING BOILER AND MAKE SAFE. PREPARE FOR CONNECTION OF NEW BOILER. EXTEND CIRCUIT AS REQUIRED. REFER TO NEW WORK PLANS FOR FURTHER INFORMATION.
2	DISCONNECT EXISTING BASE PUMP AND MAKE SAFE. PREPARE FOR CONNECTION OF NEW HEATING HOT WATER PUMP. EXTEND CIRCUIT AS REQUIRED. REFER TO NEW WORK PLANS AND ONE-LINE DIAGRAM FOR FURTHER INFORMATION.
3	DISCONNECT EXISTING VARIABLE FREQUENCY DRIVE AND MAKE SAFE. PREPARE FOR CONNECTION OF NEW VARIABLE FREQUENCY DRIVE. REFER TO NEW WORK PLANS AND ONE-LINE DIAGRAM FOR FURTHER INFORMATION.
4	DISCONNECT EXISTING CIRCULATING PUMP. REMOVE COMPLETE BACK TO SOURCE INCLUDING CONDUIT AND WIRING.
5	DISCONNECT EXISTING MOTOR STARTER. REMOVE COMPLETE BACK TO SOURCE INCLUDING CONDUIT AND WIRING. RETAIN BREAKER AS SPARE. REFER TO ONE-LINE DIAGRAM FOR FURTHER INFORMATION.
6	DISCONNECT EXISTING UNIT HEATER AND MAKE SAFE. PREPARE FOR CONNECTION OF NEW UNIT HEATER. EXTEND CIRCUIT AS REQUIRED. REFER TO NEW WORK PLANS FOR FURTHER INFORMATION.

1 / ED2.10 — ELECTRICAL DEMOLITION ENLARGED BOILER ROOM PLAN

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



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(X) NEW WORK KEYED NOTES

1	NEW BOILER EMERGENCY POWER OFF. REFER TO EMERGENCY BOILER POWER OFF WIRING DIAGRAM LOCATED ON SHEET E500. COORDINATE THE EXACT LOCATION FOR MOUNTING WITH THE OWNER PRIOR TO INSTALLATION.
2	RECONNECT NEW UNIT HEATER TO CIRCUIT AVAILABLE AS A RESULT OF THE DEMOLITION OF THE EXISTING UNIT HEATER.

2 / E2.10 — ELECTRICAL NEW WORK ENLARGED BOILER ROOM PLAN

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

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STATE OF MICHIGAN — DAVID JOHN LITTLEFIELD — ENGINEER — No. 62092 — REGISTERED PROFESSIONAL

MACOMB COUNTY EXECUTIVE BOARD OF COMMISSIONERS

HVAC EQUIPMENT RENOVATIONS

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ELECTRICAL DEMOLITION & NEW WORK ENLARGED BOILER ROOM PLANS

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
CHECKED BY TJO

REVISIONS
BIDS 05/12/2025

DATE: APRIL 01, 2025

SHEET NO.
E4.00

JOB NO.
242043

Panel Designation: LP-2A
Panel Location: MECH 202
Fed From: MDP
Feeder Size: EXISTING
NEW PANEL

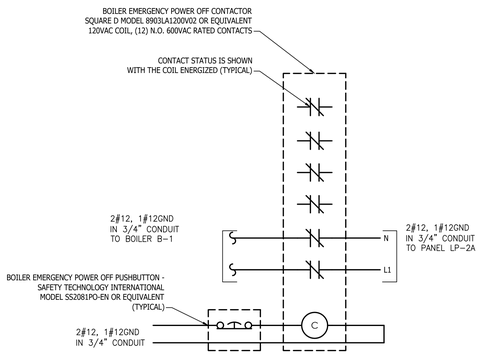
Main: MLO
Bussing: 250A
Ground Bus: STANDARD
Aounting: SURFACE
Neutral: 100%

P-P Voltage: 208
P-N Voltage: 120
Phase: 3
Wire: 4
Min SC Interrupting Rating: EXISTING

Remarks	Light Load	Recept Load	Cont Load	nonC Load	OC Prot	CKT	Ø A	Ø B	Ø C	CKT	OC Prot	nonC Load	Cont Load	Recept Load	Light Load	Remarks
TOILET LIGHTING	1000				20	1	X			2	20				1200	OFFICE LIGHTING
LOBBY LIGHTING	1500				20	3		X		4	20				1200	OFFICE LIGHTING
CORRIDOR LIGHTING	1200				20	5			X	6	20				1000	CONFERENCE ROOM LIGHTING
OPEN OFFICE LIGHTING	1000				20	7	X			8	20				800	OFFICE LIGHTING
OPEN OFFICE LIGHTING	1000				20	9		X		10	20				800	OFFICE LIGHTING
OPEN OFFICE LIGHTING	1000				20	11			X	12	20				1200	OFFICE LIGHTING
SIGN	500				20	13	X			14	20			892		PROJECTOR/SCREEN
SIGN	500				20	15		X		16	20			540		RECP
SIGN	500				20	17			X	18	20			540		RECP
SIGN	500				20	19	X			20	20			540		RECP
RECP		540			20	21		X		22	20			1080		RECP
RECP		1080			20	23			X	24	20			540		RECP
EF-2				528	20	25	X			26	20			720		RECP
EWC				1000	20	27		X		28	20			1500		COPIER
REC LOBBY AND CR		540			20	29			X	30	20			180		**CONV. RECP ROOF**
REC		540			20	31	X			32	20					SPARE
DISHWASHER				1200	20	33		X		34	20					SPARE
DISPOSAL				864	20	35			X	36	20					SPARE
U.C. REFRIGERATOR				280	20	37	X			38	20					SPARE
HHWP-3			**1176**		**20**	39		X		40	20					SPARE
BOILER B-1				**1200**	**15**	41			X	42	20					SPARE

Load Description	Connected Load ØA	ØB	ØC	Total	Demand Factor	Demand Load ØA	ØB	ØC	Total
Lighting or Continous Load (Volt-Amps)	5000	5000	4900	14900	1.00	5000	5000	4900	14900
180VA Receptacle Load (Volt-Amps)	2692	3660	2880	9232	1.00 (First 10kVA)	2692	3660	2880	9232
	Amount over 10kVA			*0*	0.50 (> 10kVA)	0	0	0	0
Continuous Load (Volt-Amps)	0	1176	0	1176	1.00	0	1176	0	1176
Non-Continuous Load (Volt-Amps)	808	2200	2064	5072	0.80	646	1760	1651	4058
Total Load (kVA)	8.50	12.04	9.84	30.38	**125% of Light/Cont and Recept**	8.34	11.60	9.43	29.37
Total Ampacity (Amps)	70.8	100.2	82.0	84.3	**(<10kVA) load plus other load**	69.4	96.6	78.5	81.5
Minimum Feeder Sizing (Amps)	86.8	118.3	98.2	101.1	**<---- per NEC Article 215.2 ---->**	85.4	114.6	94.7	98.3

Receptacle Demand Factor per Article 220.44 of the National Electrical Code.



BOILER EMERGENCY POWER SHUT OFF WIRING DIAGRAM

NO SCALE

SEQUENCE OF OPERATION:

NORMAL CONDITIONS – UNDER NORMAL CONDITIONS, THE CONTACTOR COIL IS ENERGIZED USING THE NORMALLY CLOSED CONTACT OF THE BOILER EMERGENCY POWER OFF PUSHBUTTON AND ALL OF THE ASSOCIATED CONTACTS IN THE CONTACTOR ARE CLOSED WHILE THE COIL IS ENERGIZED.

ACTIVATION – UPON BOILER EMERGENCY POWER OFF ACTIVATION BY DEPRESSING THE BOILER EMERGENCY POWER OFF PUSHBUTTON, THE CONTACTOR COIL DE-ENERGIZES AND ALL OF THE ASSOCIATED CONTACTS IN THE CONTACTOR ARE OPENED DE-ENERGIZING THE BOILERS.

RESET – TWIST THE BOILER EMERGENCY POWER OFF PUSHBUTTON TO RESET THE BOILER EMERGENCY POWER OFF SYSTEM AND RE-ENERGIZE THE CONTACTOR COIL WHICH THEN CLOSES ALL OF THE ASSOCIATED CONTACTS IN THE CONTACTOR.

FAILURE MODE – UPON POWER FAILURE TO THE BOILER EMERGENCY POWER OFF SYSTEM, THE CONTACTOR COIL DE-ENERGIZES AND ALL OF THE ASSOCIATED CONTACTS IN THE CONTACTOR ARE OPENED DE-ENERGIZING THE BOILERS.

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DAVID JOHN LITTLEFIELD
ENGINEER
No. 62921
PROFESSIONAL

MACOMB COUNTY EXECUTIVE BOARD OF COMMISSIONERS

HVAC EQUIPMENT RENOVATIONS

TALMER BUILDING - 120 N. MAIN ST., MT CLEMENS, MI 48043

ELECTRICAL DETAILS AND PANEL SCHEDULES

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

DRAWN BY TJO
CHECKED BY TJO

REVISIONS
BIDS 05/12/2025

DATE: APRIL 01, 2025

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E5.00

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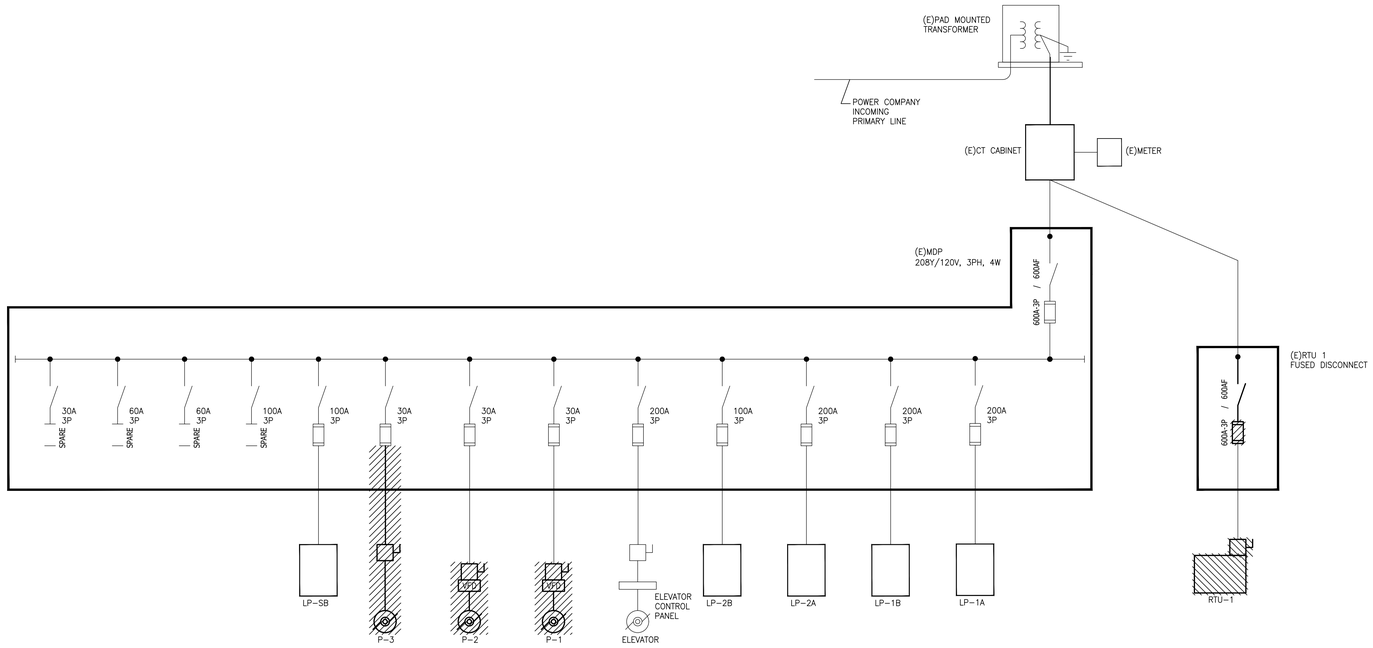
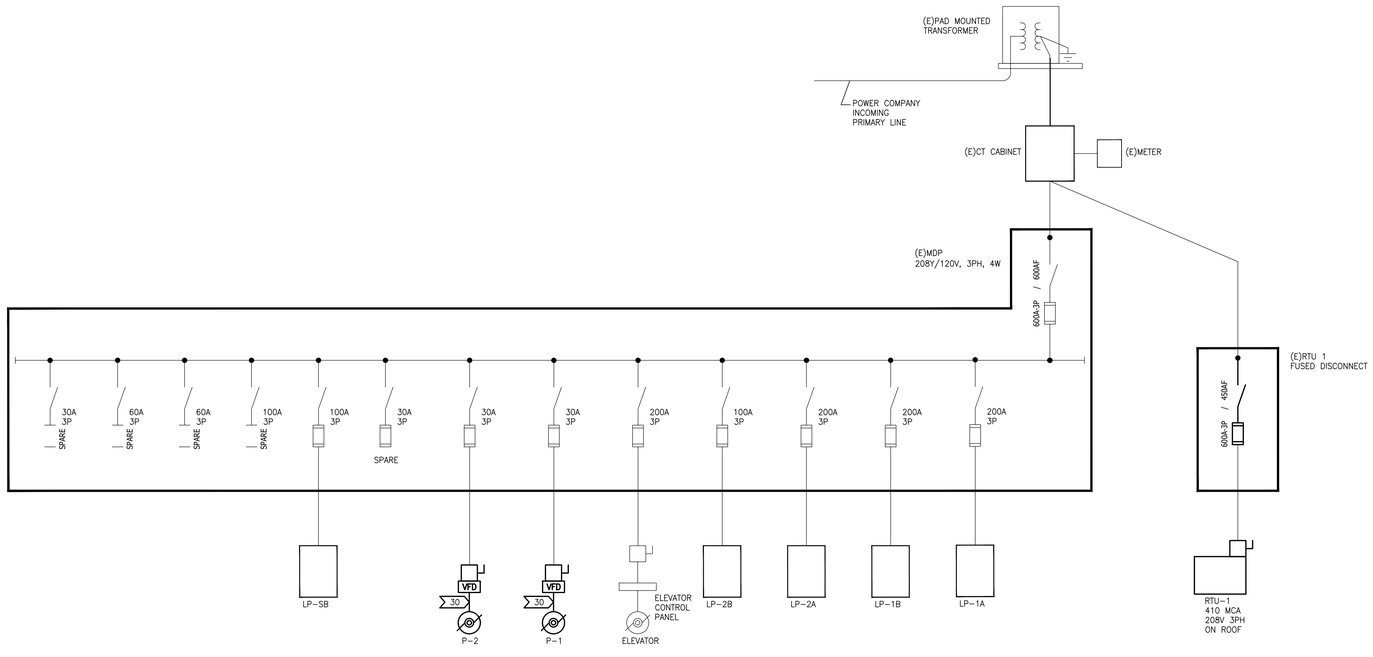


ONE-LINE DIAGRAM - DEMOLITION WORK
NO SCALE



ONE-LINE DIAGRAM - NEW WORK
NO SCALE

FEEDER (AMPS)	COND. SIZE	COPPER FEEDER AND CONDUIT SIZES	
		3 WIRE WITH GROUND	4 WIRE WITH GROUND
∑ 30	10	3/4"C, 3#10 & 1#10 GRD.	3/4"C, 4#10 & 1#10 GRD.

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ELECTRICAL ONE-LINE DIAGRAM

PRELIMINARY ☐
DESIGN DEVELOPMENT ☐
CONSTRUCTION ■
FINAL RECORD ☐

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