City of Milwaukee

Department of Public Works

Infrastructure Services Division
Facilities Development & Management Section

CITY OF MILWAUKEE DEPT. OF PUBLIC WORKS

MILWAUKEE, WISCONSIN 53202

4TH & HIGHLAND PARKING STRUCTURE RTU REPLACEMENT PROJECT

CONSTRUCTION DOCUMENTS - NOVEMBER 12, 2012

DRAWING INDEX:

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G001 GENERAL PROJECT COVER SHEET

MECHANICAL/ELECTRICAL

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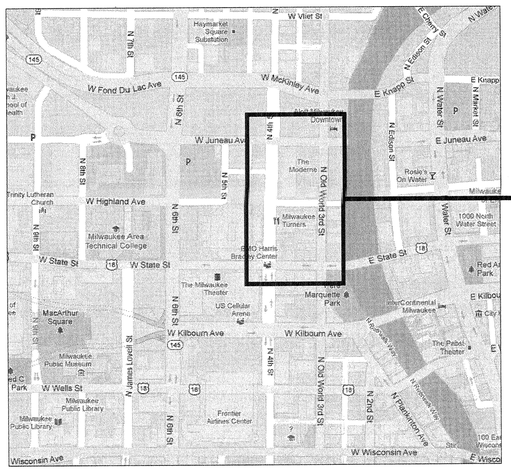
ME202 MECHANICAL/ELECTRICAL ROOF PLANS
ME800 MECHANICAL/ELECTRCAL SCHEDULES & DETAILS

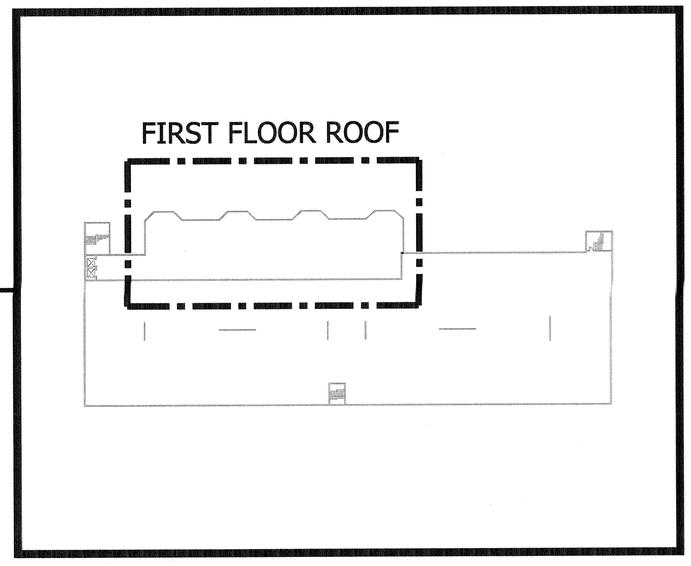
PROJECT SIGN-OFF

APPROVED:	SIGNATURE	DATE
SUPERVISOR IN CHARGE		12-11-12
DIRECTOR, FACILITIES DEVELOPMENT AND MANAGEMENT		12-12-2012
FOR COMMISSIONER OF PUBLIC WORKS		12/12/12



NORTH

GEOGRAPHIC VICINITY PLAN



NORTH

BUILDING PROJECT KEY PLAN AREA OF WORK

City of Milwaukee

Department of Public Works

Infrastructure Services Division
Facilities Development & Management Section

4TH & HIGHLAND PARKING STRUCTURE HVAC PROJECT RTU REPLACEMENT 324 WEST HIGHLAND AVENUE MILWAUKEE, WI

WISCONSIN KEVIN M. PGPE 26603 MUSKEGO, WI PROFESSIONAL ENGINEER 12-10-12

REVISION HISTORY - THIS SHEET

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GENERAL PROJECT COVER SHEET

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DRAWN	CCP

CONSTRUCTION DOCUMENTS

G001

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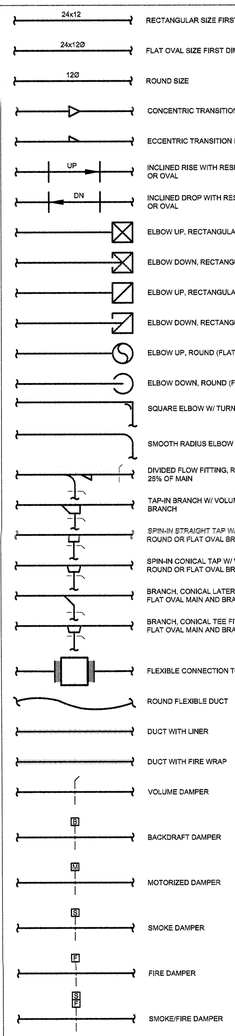
A	
ACS	AUTOMATIC CONTROL SYSTEM
AFF	ABOVE FINISHED FLOOR
AFMS	AIRFLOW MEASURING STATION
AG	AIR GAP FITTING
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
AP	ACCESS PANEL(S)
APD	AIR PRESSURE DROP
ARCH	ARCHITECT(URAL)
ATU	AIR TERMINAL UNIT
B	
BHP	BRAKE HORSE POWER
BLDG	BUILDING
BSMT	BASEMENT
BTUH	BRITISH THERMAL UNIT PER HOUR
BWV	BACK WATER VALVE
C	
CFH	CUBIC FOOT PER HOUR
CFM	CUBIC FOOT PER MINUTE
CIP	CAST IRON PIPE
CLG	CEILING
CO	CLEAN OUT
COMB	COMBINATION
CONC	CONCRETE
COND	CONDENS(ATE) (ER)
CONN	CONNECTION
CONT	CONTINU(E) (OUS) (ATION)
CONTR	CONTRACT(OR)
CORR	CORRIDOR
D	
DA	DIALYSIS ACID
DDC	DIRECT DIGITAL CONTROL (PANEL)
DEG	DEGREE(S)
DET	DETAIL
DI	DEIONIZED WATER
DIFF	DIFFUSER
DMPR	DAMPER
DN	DOWN
DW	DIALYSIS WATER
DWG(S)	DRAWING(S)
E	
EA	EACH
EA	EXHAUST AIR
ELEC	ELECTRIC(AL)
EMER	EMERGENCY
EXG	EXISTING
EXH	EXHAUST
EJ	EXPANSION JOINT
EXT	EXTERIOR
F	
F	FAHRENHEIT
FDV	FIRE DEPARTMENT VALVE
FFD	FUNNEL FLOOR DRAIN
FFE	FINISHED FLOOR ELEVATION
FLR	FLOOR
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
F&T	FLOAT AND THERMOSTATIC (TRAP)
FT	FOOT, FEET
FTG	FOOTING
FTR	FINNED TUBE RADIATION
G	
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GEN	GENERATOR
GENL	GENERAL
GPH	GALLON(S) PER HOUR
GPM	GALLON(S) PER MINUTE
GRL	GRILLE
H	
HB	HOSE BIB
HP	HIGH PRESSURE
HP	HORSEPOWER
HTG	HEATING
HTR	HEATER
HV	HOSE VALVE
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
I	
ID	INSIDE DIAMETER/DIMENSION
IN	INCH(ES)
INSUL	INSULATION
INV	INVERT
L	
LBS/HR	POUNDS PER HOUR
LF	LINEAL FOOT, FEET
LVR	LOUVER
M	
MAX	MAXIMUM
MBH	1000 BTUH
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL(LY)
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MIN	MINUTE
MISC	MISCELLANEOUS
N	
NIC	NOT IN CONTRACT
NO	NUMBER
NTS	NOT TO SCALE
O	
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER/DIMENSION
P	
PD	PRESSURE DROP
PLBG	PLUMBING
PRES	PRESSURE
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
R	
R	RADIUS
RA	RETURN AIR
REG	REGISTER
REQD	REQUIRED
RH	RELATIVE HUMIDITY
RM	ROOM
RO	REVERSE OSMOSIS
RPM	REVOLUTIONS PER MINUTE
RPZ	REDUCED PRESSURE BACKFLOW PREVENTER
RTU	ROOFTOP UNIT
S	
SA	SUPPLY AIR
SHT	SHEET
SP	STATIC PRESSURE
SPEC(S)	SPECIFICATION(S)
SQ	SQUARE
SS	STAINLESS STEEL
STRUC	STRUCTUR(E) (AL)
T	
T	THERMOSTAT
TEMP	TEMPERATURE
TMV	THERMOSTATIC MIXING VALVE
TYP	TYPICAL
V	
VAV	VARIABLE AIR VOLUME
VENT	VENTILATION OR VENTILATOR
VERT	VERTICAL
VIB SOL	VIBRATION ISOLATION
VOL	VOLUME
VS	VENT STACK
VSD	VARIABLE SPEED DRIVE (MOTOR CONTROLLER)
VTR	VENT THROUGH ROOF
W	
W	WASTE
W/	WITH
W/O	WITHOUT
WH	WALL HYDRANT
WS	WASTE STACK
WTR	WATER

REFER TO PIPING, FIRE PROTECTION AND MEDICAL GAS DESIGNATIONS AND EQUIPMENT SCHEDULES FOR ADDITIONAL ABBREVIATIONS.

THIS IS THE MASTER HGA ABBREVIATION LIST. IT SHOULD NOT BE EDITED. ADD AN ENTRY TO IT ONLY IF IT IS ABSOLUTELY NECESSARY FOR THE PROJECT.

1



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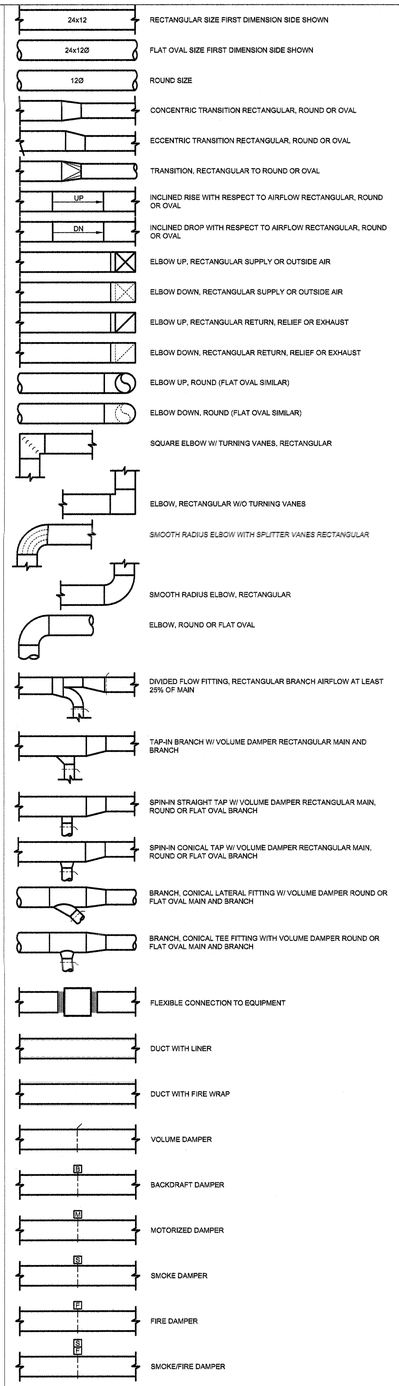

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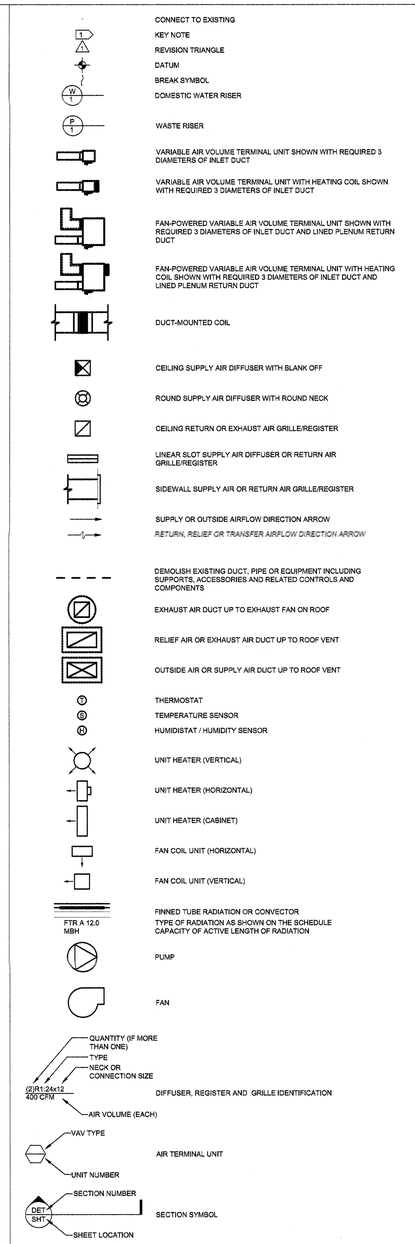

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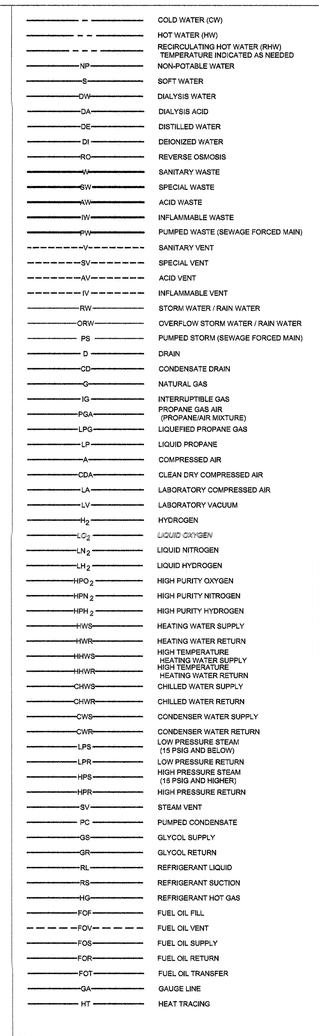

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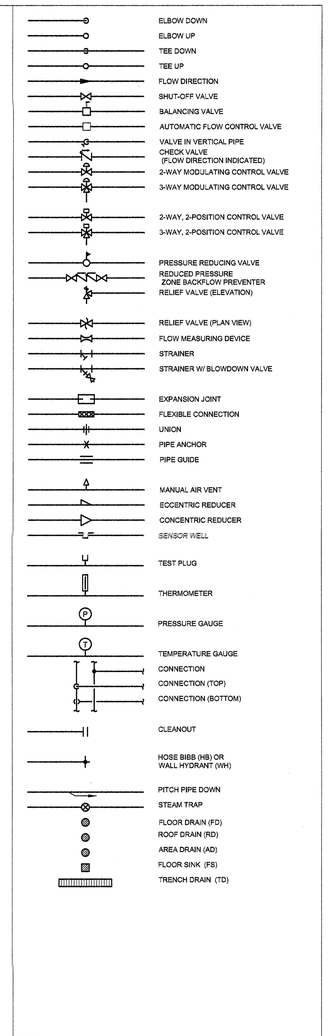

6

ELECTRICAL SYMBOLS

	MOTOR DISCONNECT
	GFCI RECEPTACLE

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MECHANICAL/ELECTRICAL SYMBOLS & ABBREVIATIONS

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CONSTRUCTION DOCUMENTS

ME001

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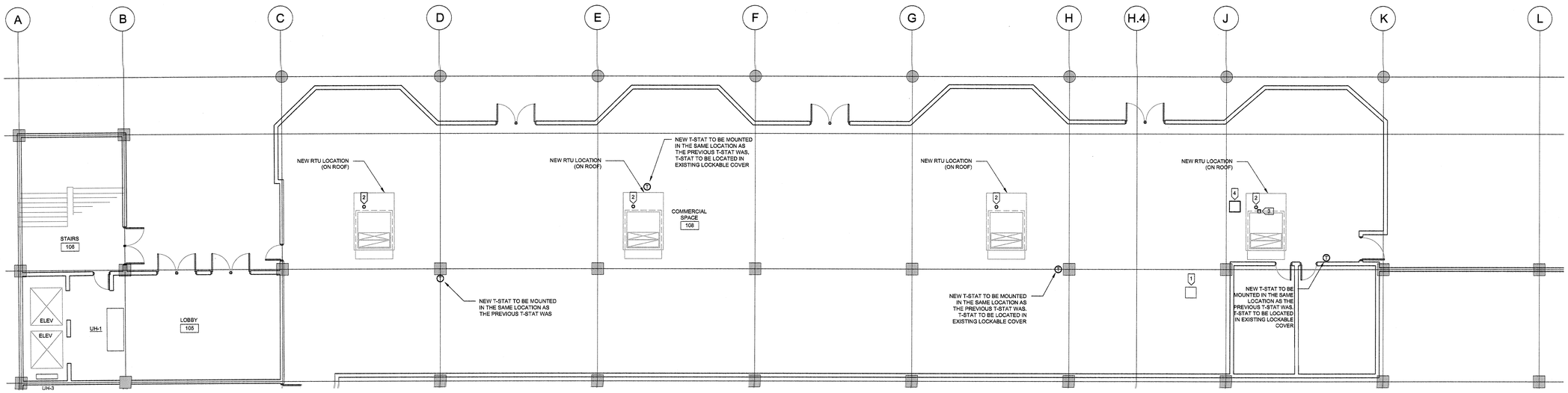


GENERAL NOTES

A. THE INFORMATION SHOWN PERTAINING TO EXISTING CONDITIONS SUCH AS LOCATION OF EQUIPMENT, PIPING, OUTLETS, AND OTHER BUILDING CONDITIONS HAS BEEN BASED ON "AS-BUILT" RECORDS AND FIELD VERIFICATION WITH LIMITED ACCESS. LAYOUT AND DISTRIBUTION OF PIPING AND DUCTWORK MAY BE DIFFERENT THEN IN THE FIELD.

1 / ME201 FIRST FLOOR MECHANICAL/ELECTRICAL PLAN

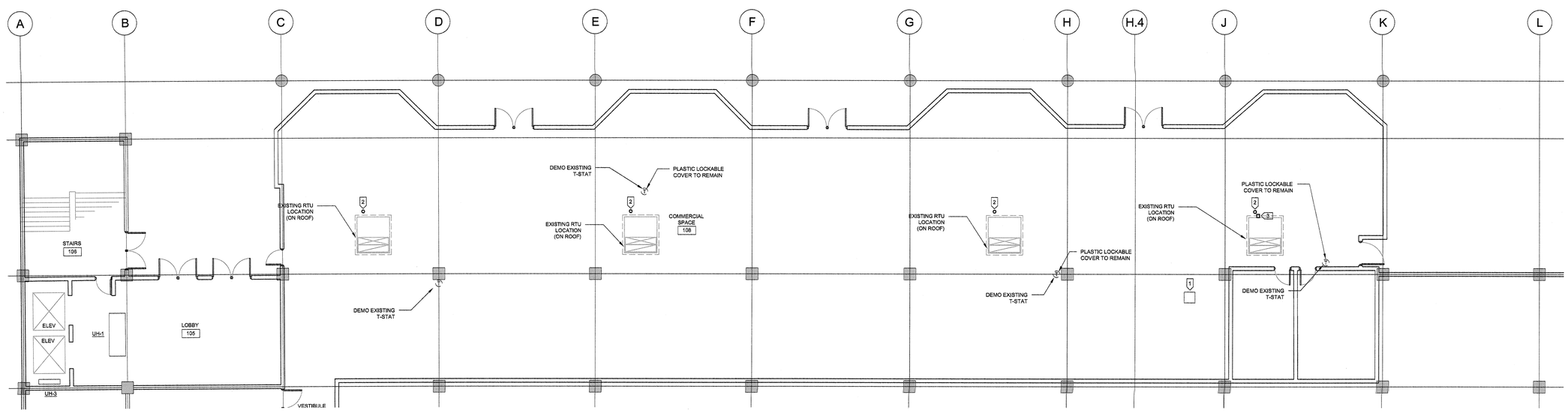
1/8" = 1'-0"

ELECTRICAL GENERAL NOTES

A. VERIFY EXISTING CONDUCTORS SERVING RTU ARE #4 AWG OR LARGER.

ELECTRICAL KEYED NOTES X

1. EXISTING RTU FEEDER PULL BOX. UTILIZE THIS BOX TO PULL CONDUCTORS BACK. FEEDER RUN WILL NEED TO BE EXTENDED TO FEED NEW RTU.
2. EXISTING ROOFTOP PENETRATION. RESTORE WEATHERPROOFING AFTER INSTALLATION OF NEW CONDUITS THROUGH ROOF. SEE SPECIFICATION FOR ROOFING RESTORATION.
3. EXISTING JUNCTION BOX FOR 120V WIRING. RELOCATE IF NECESSARY TO COORDINATE CONDUIT PLACEMENT THROUGH PENETRATION.
4. PROVIDE NEW JUNCTION/SPLICE BOX NEAR PENETRATION. PROVIDE MINIMUM (3) #4 AWG THWN COPPER CONDUCTORS WITH #8 AWG GROUND.



DEMOLITION GENERAL NOTES

A. THE INFORMATION SHOWN PERTAINING TO EXISTING CONDITIONS SUCH AS LOCATION OF EQUIPMENT, PIPING, OUTLETS, AND OTHER BUILDING CONDITIONS HAS BEEN BASED ON "AS-BUILT" RECORDS AND FIELD VERIFICATION WITH LIMITED ACCESS. LAYOUT AND DISTRIBUTION OF PIPING AND DUCTWORK MAY BE DIFFERENT THEN IN THE FIELD.

B. THE CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF PIPING AND ACCESSORIES.

C. CONTRACTOR SHALL COORDINATE ALL SYSTEM/EQUIPMENT SHUT-DOWNS WITH THE BUILDING OWNER. NOTIFY ARCHITECT/ENGINEER OF ANY CONFLICTS.

D. EQUIPMENT, PIPING, DUCTWORK, AND OTHER ACCESSORIES INDICATED AS DASHED SHALL BE DEMOLISHED. PROTECT EXISTING ROOF CURBS, ENDS OF ELECTRICAL WIRING, PIPING AND DUCTWORK MAINS FOR FUTURE RECONNECTION.

E. ITEMS TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UNLESS NOTED OTHERWISE.

F. FOR MORE INFORMATION ON ROOFTOP UNIT DEMOLITION REFER TO DETAIL NO. 1 ON SHEET ME800.

2 / ME201 FIRST FLOOR MECHANICAL/ELECTRICAL DEMO PLAN

1/8" = 1'-0"

DEMOLITION ELECTRICAL KEYED NOTES X

1. APPROXIMATE LOCATION OF PULL BOX IN CEILING OF FIRST FLOOR. EXISTING CONDUIT IS CONTINUOUS FROM PULL BOX TO RTU DISCONNECT. SEE NEW WORK FOR MODIFICATION TO EXISTING CONDUIT RUN. FIELD VERIFY SIMILAR CONFIGURATION FOR OTHER RTUs.
2. EXISTING ROOF PENETRATION. REMOVE WEATHERPROOFING IN ORDER TO RE-WORK CONDUITS.
3. EXISTING JUNCTION BOX. THIS BOX IS SOURCE FOR 120V RECEPTACLE CIRCUIT USED FOR RTU SERVICE. DISCONNECT 1/2" CONDUIT. FIELD VERIFY SIMILAR CONFIGURATION FOR OTHER RTUs.

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REVISION HISTORY - THIS SHEET

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FIRST FLOOR MECHANICAL/ELECTRICAL PLANS

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CONSTRUCTION DOCUMENTS

ME201

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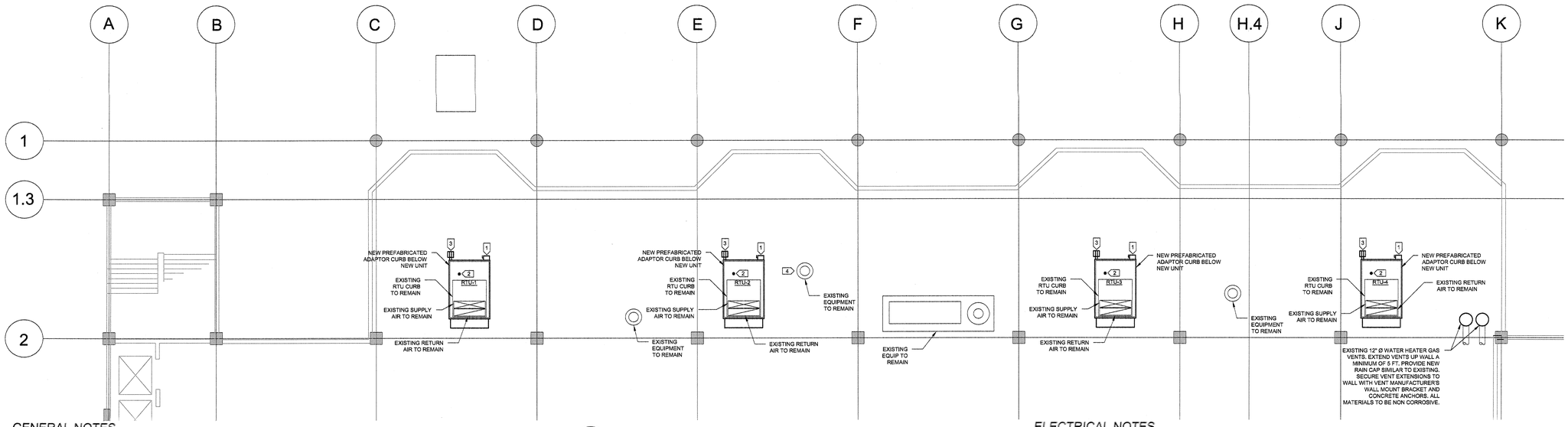


GENERAL NOTES

A. THE INFORMATION SHOWN PERTAINING TO EXISTING CONDITIONS SUCH AS LOCATION OF EQUIPMENT, PIPING, OUTLETS, AND OTHER BUILDING CONDITIONS HAS BEEN BASED ON "AS-BUILT" RECORDS AND FIELD VERIFICATION WITH LIMITED ACCESS. LAYOUT AND DISTRIBUTION OF PIPING AND DUCTWORK MAY BE DIFFERENT THEN IN THE FIELD.

B. FOR MORE INFORMATION ON EQUIPMENT REFER TO THE SCHEDULES ON SHEET M800.

C. FOR MORE INFORMATION ON ROOFTOP UNIT INSTALLATION REFER TO DETAIL NO. 2 ON SHEET M800.

1 / ME202 MECHANICAL/ELECTRICAL ROOF PLAN
1/8" = 1'-0"

ELECTRICAL NOTES

A. EXTEND EXISTING CIRCUIT TO NEW DISCONNECTING MEANS. VERIFY EXISTING CONDUCTOR SIZE IS #4 AWG OR LARGER.

B. PROVIDE #8 AWG EQUIPMENT GROUND FROM NEAREST JUNCTION BOX TO RTU ENCLOSED CIRCUIT BREAKER.

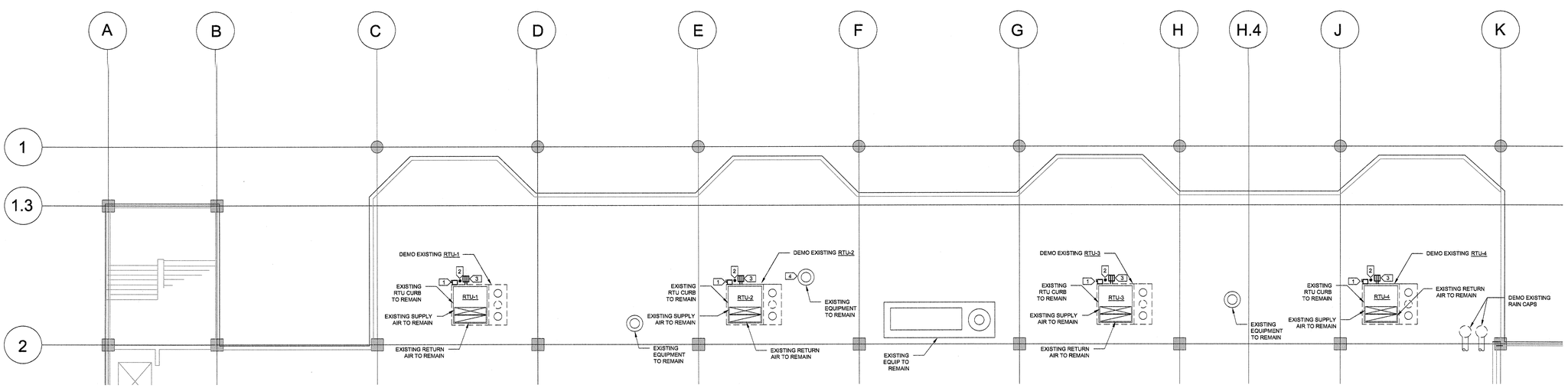
C. COORDINATE ELECTRICAL WORK ASSOCIATED WITH RTUs WITH MANUFACTURER'S REQUIREMENTS.

D. MINIMUM WIRE SIZE FROM ENCLOSED CIRCUIT BREAKER TO RTU SHALL BE (3) #6 AWG WITH (1) #10 AWG GROUND.

E. POWER CONNECTIONS ARE SHOWN UTILIZING THE EXISTING ROOF PENETRATION. CONFIGURATION OF RTU BASE ADAPTER MIGHT INVALIDATE THIS APPROACH. PROVIDE UNIT COST FOR RELOCATION OF ROOF PENETRATION APPROXIMATELY 25 INCHES WEST OF EXISTING. INCLUDE COST TO RESTORE ROOFING AT EXISTING LOCATION.

ELECTRICAL KEYED NOTES

1. PROVIDE NEW NEMA 3R ENCLOSED 60 A CIRCUIT BREAKER FOR RTU OVERCURRENT PROTECTION AND DISCONNECTING MEANS.
2. RE-WORK CONDUIT LOCATIONS IN ROOF PENETRATION. REFER TO ME800 FOR DETAILS.
3. PROVIDE 20A GFCI DAMP LOCATION RECEPTACLE WITH IN-USE WEATHERPROOF COVER. CONNECT TO EXISTING RTU SERVICE RECEPTACLE CIRCUIT SAVED IN DEMOLITION PHASE.
4. RECONNECT EQUIPMENT USING SAME CIRCUIT SAVED IN DEMOLITION PHASE. PROVIDE LIQUIDTIGHT FLEXIBLE METAL CONDUIT CONNECTION AT EQUIPMENT.



DEMOLITION GENERAL NOTES

A. THE INFORMATION SHOWN PERTAINING TO EXISTING CONDITIONS SUCH AS LOCATION OF EQUIPMENT, PIPING, OUTLETS, AND OTHER BUILDING CONDITIONS HAS BEEN BASED ON "AS-BUILT" RECORDS AND FIELD VERIFICATION WITH LIMITED ACCESS. LAYOUT AND DISTRIBUTION OF PIPING AND DUCTWORK MAY BE DIFFERENT THEN IN THE FIELD.

B. THE CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF PIPING AND ACCESSORIES.

C. CONTRACTOR SHALL COORDINATE ALL SYSTEM/EQUIPMENT SHUT-DOWNS WITH THE BUILDING OWNER. NOTIFY ARCHITECT/ENGINEER OF ANY CONFLICTS.

D. EQUIPMENT, PIPING, DUCTWORK, AND OTHER ACCESSORIES INDICATED AS DASHED SHALL BE DEMOLISHED. PROTECT EXISTING ROOF CURBS, ENDS OF ELECTRICAL WIRING, PIPING AND DUCTWORK MAINS FOR FUTURE RECONNECTION.

E. ITEMS TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UNLESS NOTED OTHERWISE.

F. FOR MORE INFORMATION ON ROOFTOP UNIT DEMOLITION REFER TO DETAIL NO. 1 ON SHEET ME800.

2 / ME202 MECHANICAL/ELECTRICAL ROOF DEMO PLAN
1/8" = 1'-0"

DEMOLITION ELECTRICAL KEYED NOTES

1. EXISTING RTU DISCONNECTING MEANS TO BE REMOVED. PULL WIRES BACK AT NEAREST PULL BOX. RTUs ARE FED FROM TENANT 480V PANEL IN LOWER LEVEL MAIN ELECTRICAL ROOM. ELEC. ROOM IS LOCATED BETWEEN COLUMNS H & J; 1.9 & 2.9.
2. EXISTING PITCH POCKET TO BE REPLACED. USE EXISTING PENETRATION.
3. EXISTING WEATHERPROOF GFCI RECEPTACLE. REMOVE RECEPTACLE, CONDUIT AND WIRE BACK TO JUNCTION BOX IN CEILING BELOW. CIRCUIT WILL BE USED FOR NEW WEATHERPROOF GFCI.
4. EXISTING FAN TO REMAIN IN SERVICE. DISCONNECT TEMPORARILY TO COORDINATE CONDUIT RE-WORK AND PLACEMENT THROUGH PITCH POCKET AT RTU-2.

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MECHANICAL/ELECTRICAL ROOF PLANS

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ME202

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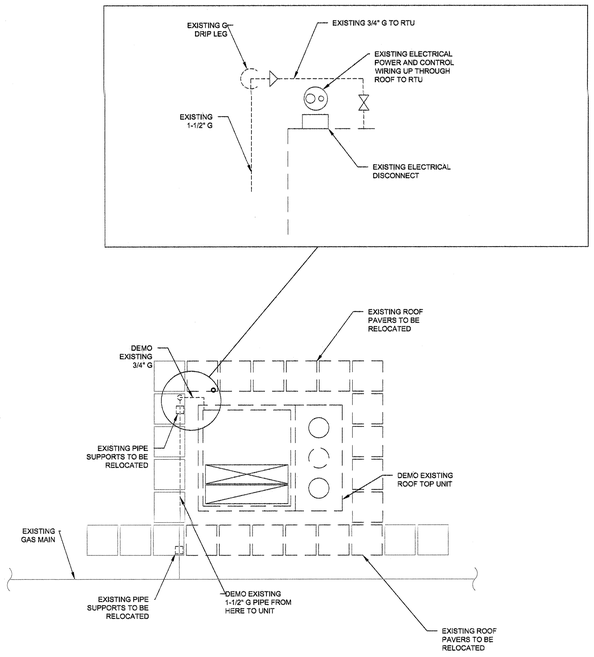
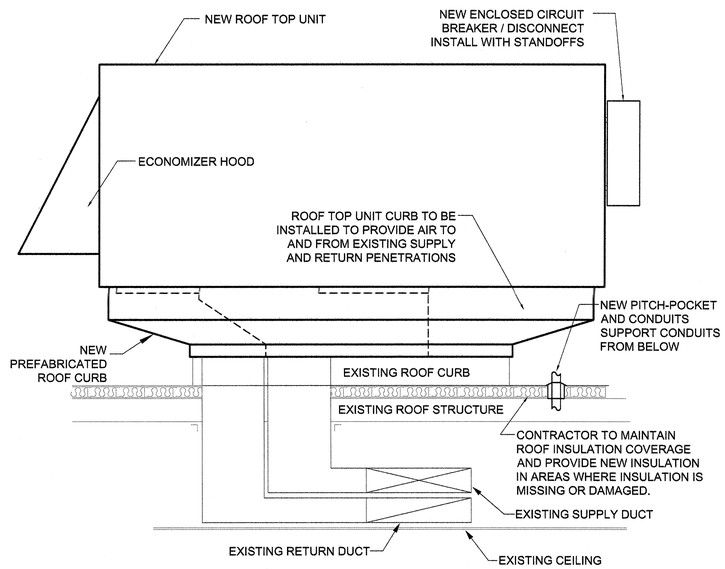
ROOFTOP UNIT SCHEDULE (RTU)

		SUPPLY FAN							DX COOLING COIL				GAS FIRED HEAT EXCHANGER				ELECTRCIAL DATA							
TAG	LOCATION	SA (CFM)	MIN OAI (CFM)	MOTOR HP	TSP (IN WG)	ESP (IN WG)	NOMINAL TONS	EER	EAT DB (DEG F)	EAT WB (DEG F)	LAT DB (DEG F)	LAT WB (DEG F)	EAT (DEG F)	LAT (DEG F)	INPUT (MBH)	OUTPUT (MBH)	VOLTAGE	Hz	PHASE	MCA	MOP	MANUFACTURER	MODEL	NOTES
RTU-1	ROOF OF COMMON AREA	6,000	1,200	5.0	1.40	1.00	17.5	11.0	79.0	67.0	55.0	55.5	55.0	98.0	350.0	284.0	460.0	60.0	3.0	44.0	60.0	TRANE	YSD210	
RTU-2	ROOF OF COMMON AREA	6,000	1,200	5.0	1.40	1.00	17.5	11.0	79.0	67.0	55.0	55.5	55.0	98.0	350.0	284.0	460.0	60.0	3.0	44.0	60.0	TRANE	YSD211	
RTU-3	ROOF OF COMMON AREA	6,000	1,200	5.0	1.40	1.00	17.5	11.0	79.0	67.0	55.0	55.5	55.0	98.0	350.0	284.0	460.0	60.0	3.0	44.0	60.0	TRANE	YSD212	
RTU-4	ROOF OF COMMON AREA	6,000	1,200	5.0	1.40	1.00	17.5	11.0	79.0	67.0	55.0	55.5	55.0	98.0	350.0	284.0	460.0	60.0	3.0	44.0	60.0	TRANE	YSD213	

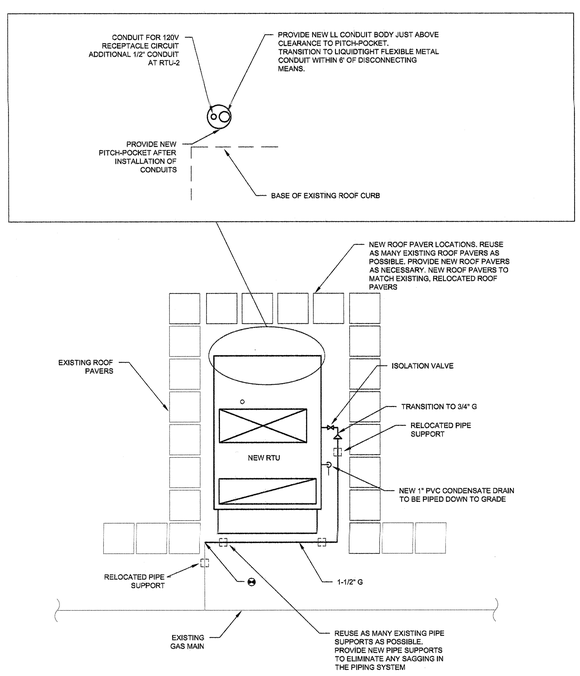
NOTES:
1. ESP INCLUDES PRESSURE DROP EXTERIOR TO UNIT
2. TSP INCLUDES PRESSURE DROPINTERIOR AND EXTERIOR TO UNIT



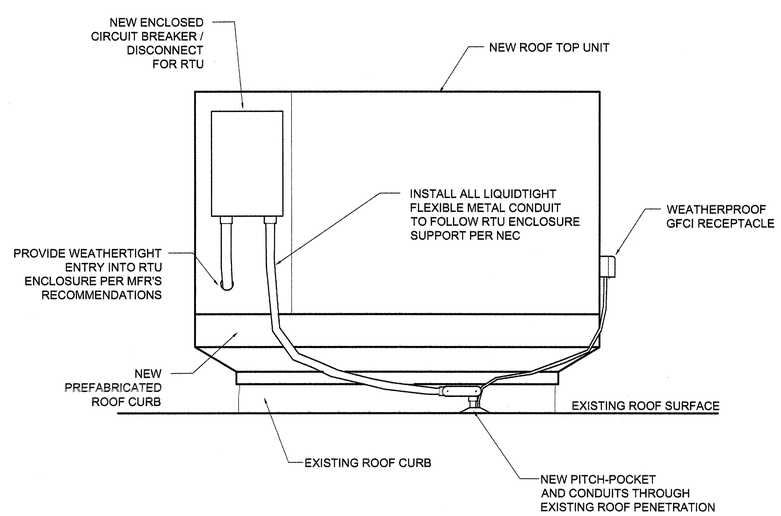
1 TYPICAL ROOFTOP UNIT DEMOLITION PLAN
NOT TO SCALE



3 TYPICAL ROOFTOP UNIT INSTALLATION SECTION
NOT TO SCALE



2 TYPICAL ROOFTOP UNIT INSTALLATION PLAN
NOT TO SCALE



4 TYPICAL ROOFTOP UNIT ELECTRICAL ELEVATION
NOT TO SCALE

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