

CITY OF WORCESTER

HOPE CEMETERY OFFICE BUILDING HVAC

SYSTEM UPGRADE

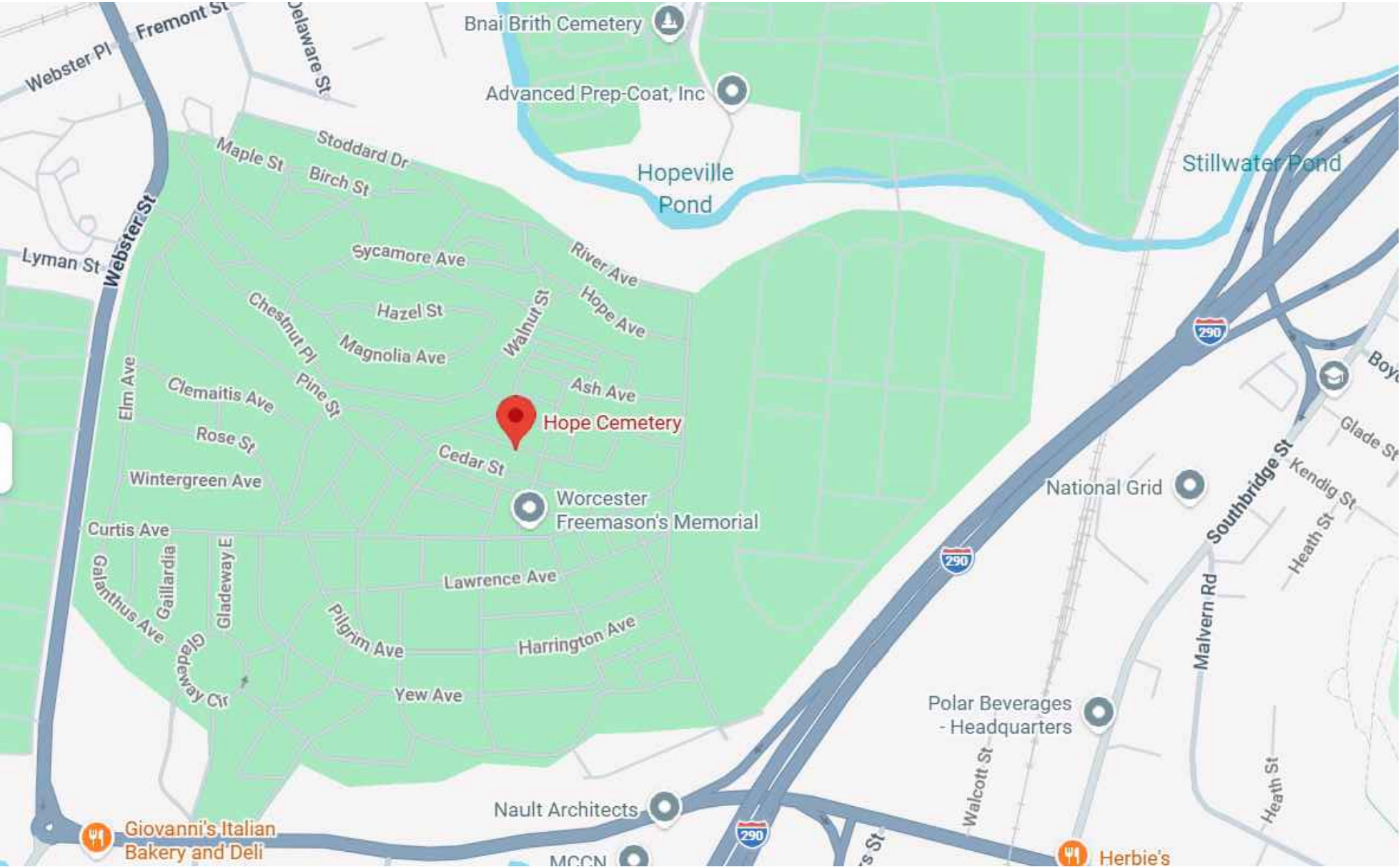
119 WEBSTER STREET,
WORCESTER, MA 01603



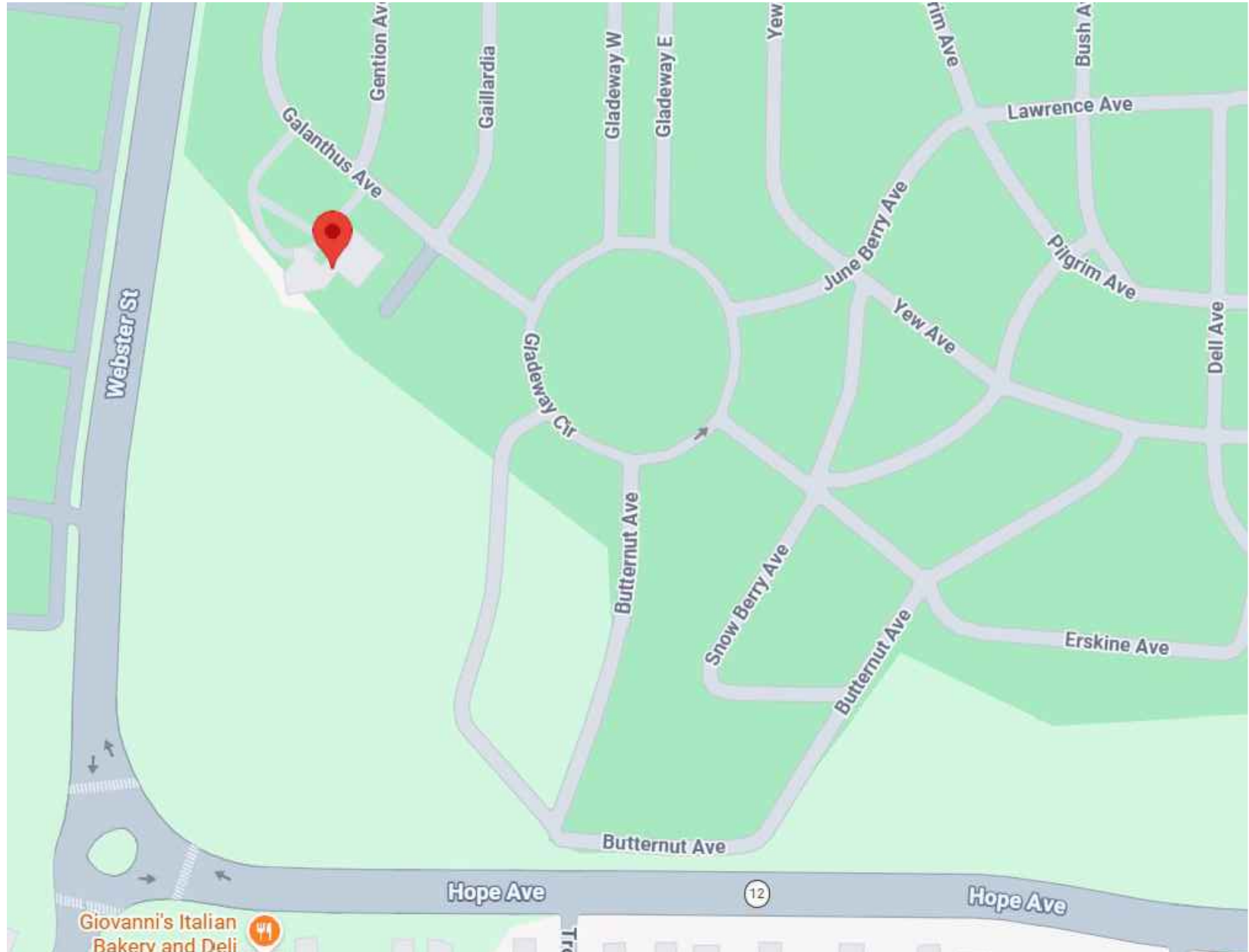
DRAWING LIST

- GENERAL**
- G001 COVER SHEET
- MECHANICAL**
- M001 MECHANICAL LEGEND, NOTES AND ABBREVIATIONS
MD100 MECHANICAL DEMOLITION PLAN
M100 MECHANICAL NEW WORK PLAN
M601 MECHANICAL DETAILS, CONTROLS, & SCHEDULES
- ELECTRICAL**
- E001 ELECTRICAL LEGEND, NOTES AND ABBREVIATIONS
ED100 ELECTRICAL DEMOLITION PLAN
E100 ELECTRICAL NEW WORK PLAN
E601 ELECTRICAL SCHEDULES
- FIRE ALARM**
- FA100 FIRE ALARM NEW WORK PLAN

VICINITY MAP



LOCALITY MAP



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200 Brickstone Square,
Andover, MA 01810-4488
T: 978.258.6200
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CLIENT

CONSULTANT

PROJECT NAME

CITY OF WORCESTER
HOPE CEMETERY
OFFICE BUILDING
HVAC SYSTEM
UPGRADE

119 WEBSTER ST
WORCESTER, MA 01603

KEY PLAN

REVISION/ISSUANCE

#	DESCRIPTION	DATE

PROJECT NO.:
DESIGNED BY:
CHECKED BY:
DATE:
SCALE:

PROJECT NUMBER:
DCG
CH
06.24.2026
NTS

SHEET NAME

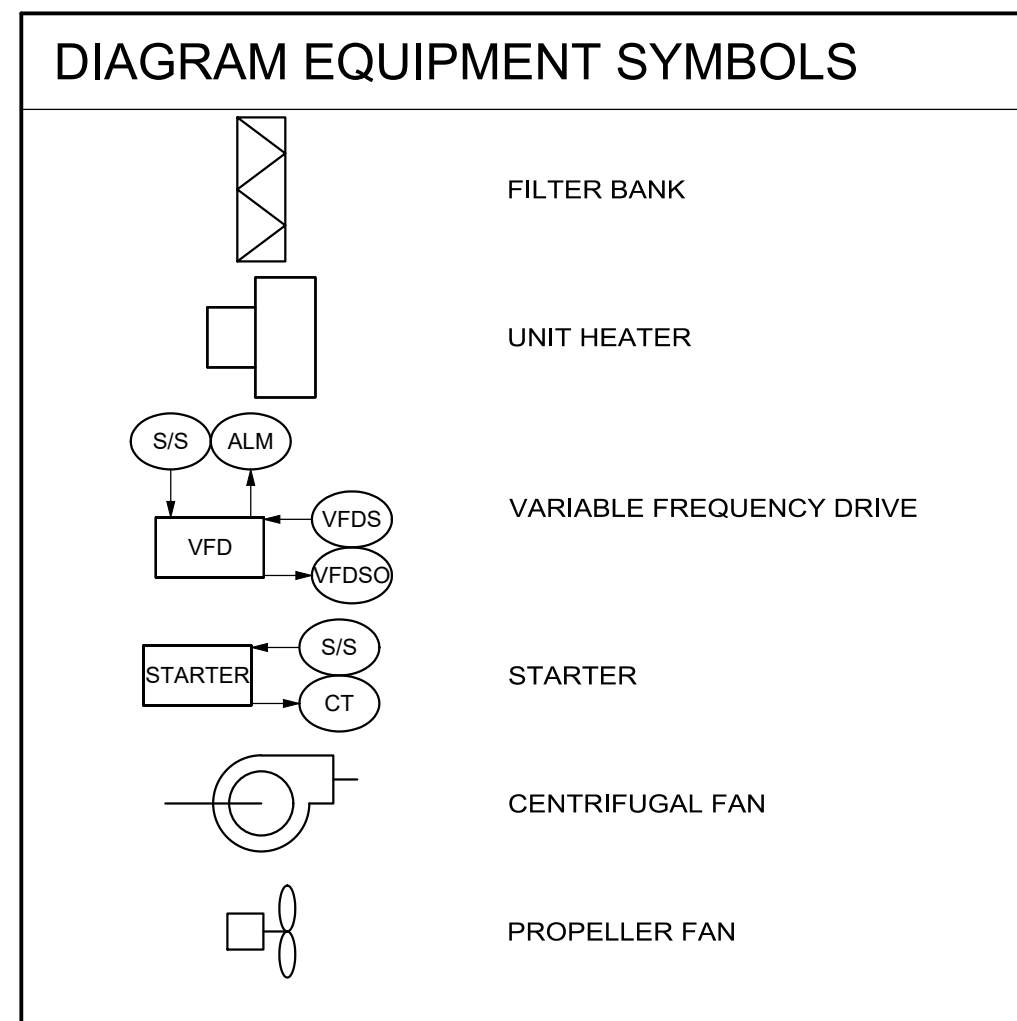
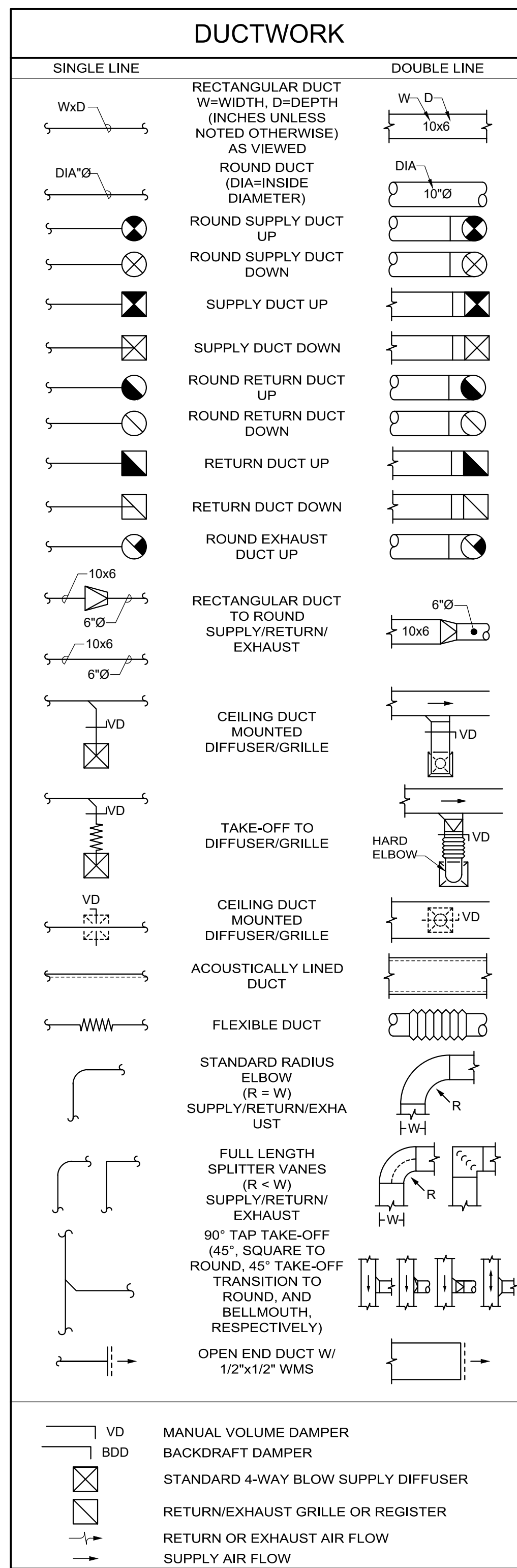
COVER SHEET

SHEET NUMBER

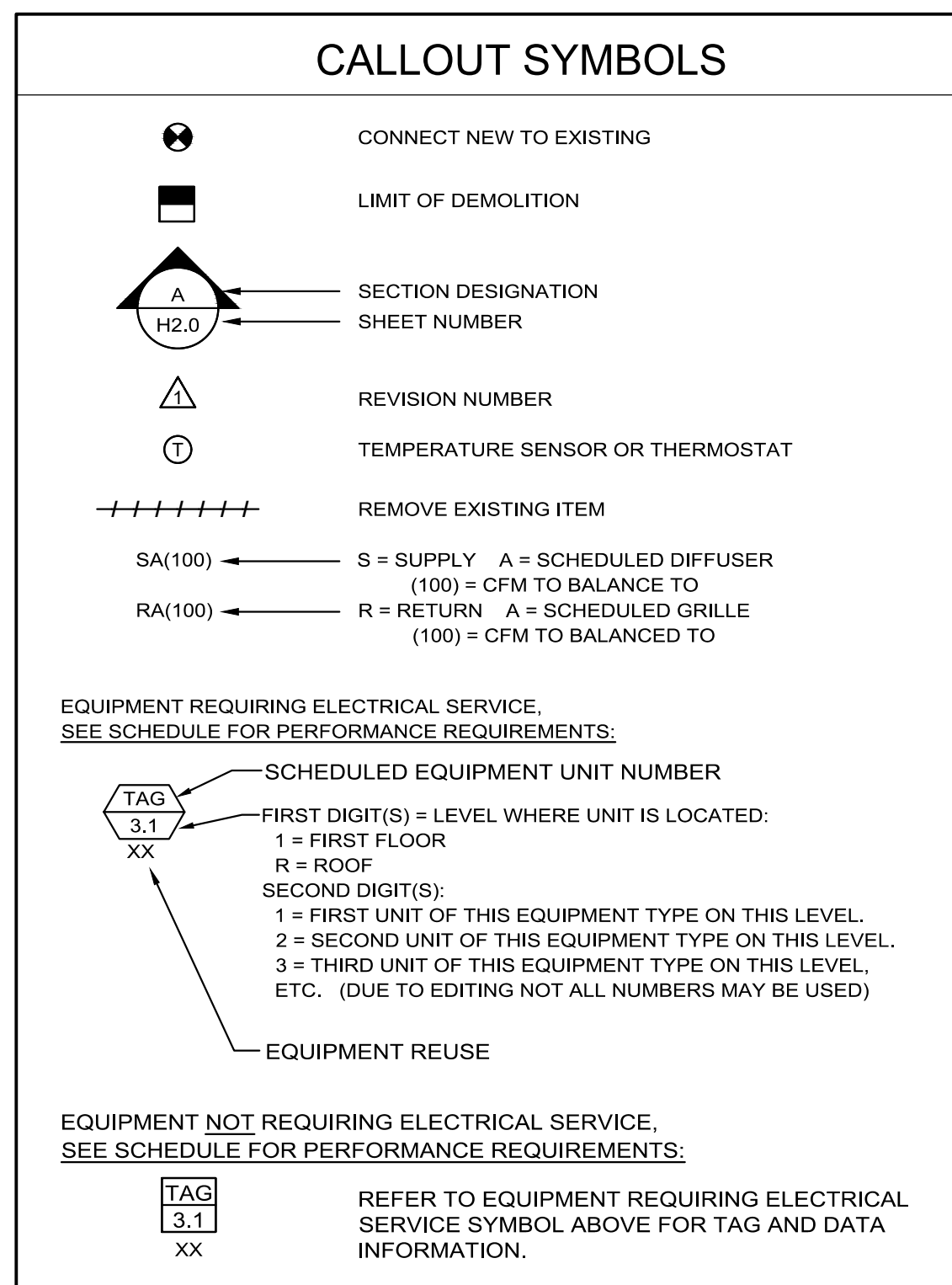
G001

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ABBREVIATIONS			
GENERAL			
AD	COMPRESSED AIR	N/A	NOT APPLICABLE
AD	ACCESS DOOR	NC	NORMALLY CLOSED OR NOISE CRITERIA
ADD'L	ADDITIONAL	NIC	NOT IN CONTRACT
AF	AIR FOIL	NO	NORMALLY OPEN
AF	ABOVE FINISHED FLOOR	NO	NUMBER
AFR	ABOVE FINISHED ROOF	NOM	NOMINAL
ALT	ALTITUDE OR ALTERNATE	NTS	NOT TO SCALE
AMP	AMPERE		
AP	ACCESS PANEL	OA	OUTSIDE AIR
APD	AIR PRESSURE DROP	OAI	OUTSIDE AIR INTAKE
ARCH	ARCHITECT	OC	ON CENTER
AS	AIR STREAM	OD	OUTSIDE DIAMETER
ATC	AUTOMATIC TEMPERATURE CONTROL	ODP	OPEN DRIP DROP
ATM	ATMOSPHERE	OV	OUTLET VELOCITY
AVE	AVERAGE		
		PCF	POUNDS PER CUBIC FOOT
BHP	BRAKE HORSEPOWER	PD	PRESSURE DROP
BI	BACKWARDS INCLINED	PH	PHASE
BLDG	BUILDING	PIB	PLUMBING
BOD	BOTTOM OF DUCT	POS	PROVIDED BY OTHER SECTION
BQ	BASQUEMENT	PSI	POUNDS PER SQUARE INCH
BTU	BRITISH THERMAL UNIT	PSIA	POUNDS PER SQUARE INCH ABSOLUTE
BTUH	BTU PER HOUR	PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
		PSIG	POUNDS PER SQUARE INCH GAUGE
		PVC	POLYVINYL CHLORIDE
C TO C	CENTER TO CENTER		
CENT	CENTRIFUGAL	QTY	QUANTITY
CF	CUBIC FEET		
CFM	CUBIC FEET PER MINUTE	R	RADIUS
CL	CENTERLINE	RA	RETURN AIR
CLG	CEILING OR COOLING	RET	RETURN
CO	CARBON MONOXIDE	REQ'D	REQUIRED
COLUMN	COLUMN	RH	RELATIVE HUMIDITY
CONC	CONCRETE	RLA	RUNNING LOAD AMPS
CONN	CONNECTION	RLF	RELIEF
CONTR	CONTRACTOR	RM	ROOM
		RPM	REVOLUTIONS PER MINUTE
D	DRAIN OR DEPTH		
DB	DRY BULB TEMPERATURE	SCH	SCHEDULE
DEG	DEGREE	SCR	SCREEN
DDC	DIRECT DIGITAL CONTROL	SCT	SATURATED CONDENSING TEMPERATURE
DIAMETER	DIAMETER	SDT	SMOKE DETECTOR
DIM	DIMENSION	SEN	SENSIBLE
DN	DOWN	SHC	SENSIBLE HEAT CAPACITY
DP	DIFFERENTIAL PRESSURE	SP	STATIC PRESSURE
		SPECS	SPECIFICATIONS
EA	EACH OR EXHAUST AIR	SQ	SQUARE
EAT	ENTERING AIR TEMPERATURE	SF	SQUARE FEET
EFF	EFFICIENCY	SS	STAINLESS STEEL
ELEC	ELECTRICAL	STL	STEEL
ELEV	ELEVATION	SUP	SUPPLY
EMER	EMERGENCY		
EMS	ENERGY MANAGEMENT SYSTEM	T	TEMPERATURE
ENT	ENTER	TA	THROWAWAY
ESP	EXTERNAL STATIC PRESSURE	TEL	TELEPHONE
EWT	ENTERING WATER TEMPERATURE	TEFC	TOTALLY ENCLOSED FAN COOLED
EXH	EXHAUST	TEMP	TEMPERATURE
EXIST	EXISTING	TSTAT	THERMOSTAT
EXT	EXTERNAL	TON	12,000 BTUH COOLING CAPACITY
EXP	EXPANSION	TOT	TOTAL
		Typ	TYPICAL
F	FAHRENHEIT		
FA	FREE AREA	UC	UNDERCUT DOOR
FC	FLEXIBLE CONNECTION		
FLA	FULL LOAD AMPS	V	VOLTS (ELECTRICAL)
FLEX	FLEXIBLE	VEL	VELOCITY
FLDR	FLOOR DRAIN		
FM	FEET PER MINUTE	W	WIDTH OR WATT
FPS	FEET PER SECOND	W	WITH
FRP	FIBERGLASS REINFORCED PLASTIC	WB	WET BULB TEMPERATURE
FS	FLOW SWITCH	WC	WATER COLUMN
FT	FEET	WG	WATER GAUGE
		WO	WITHOUT
G	GAS	WPD	WATER PRESSURE DROP
GA	GAUGE	WTD	WATER TEMPERATURE DIFFERENCE
GAL	GALLONS		
GALV	GALVANIZED	X	EXISTING EQUIPMENT TO BE REMOVED
GEN	GENERAL CONTRACTOR	XM	EXISTING EQUIPMENT TO REMAIN
GFLY	GLYCOL FEED UNIT	XM	NEW LOCATION OF RELOCATED EQUIPMENT
GPH	GALLONS PER HOUR	XR	EXISTING EQUIPMENT TO BE RELOCATED
GPM	GALLONS PER MINUTE		
GRD	GRADE	DUCT	
GWB	GYPSPUM WALL BOARD	ACD	AUTOMATIC CONTROL DAMPER
		BDD	BACKDRIFT DAMPER
HB	HOSE BIBB CONN.	BOD	BOTTOM OF DUCT
HD	HEAD	CD	CEILING DIFFUSER
HGT	HEIGHT	CV	CONSTANT VOLUME SUPPLY AIR TERMINAL
HHP	HORSEPOWER OR HIGH POINT	DIFF	DIFFUSER
HR	HOUR	EA	EXHAUST AIR
HTG	HEATING	RA	RETURN AIR
HZ	HERTZ (FREQUENCY, CYCLES PER SECOND)	RG	RETURN GRILLE
		SA	SUPPLY AIR
ID	INSIDE DIAMETER	SG	SUPPLY GRILLE
IN	INCHES	TOD	TOP OF DUCT
		TSP	TOTAL STATIC PRESSURE (IN. WG)
kW	KILOWATT	VD	VOLUME DAMP
		WMS	WIRE MESH SCREEN
L	LENGTH		
LAT	LEAVING AIR TEMPERATURE	EQUIPMENT	
LB	POUND	DDC	DIRECT DIGITAL CONTROL
LF	LINEAR FEET	DX	DIRECT EXPANSION
LP	LOW POINT	EBB	ELECTRIC BASEBOARD HEATER
LRA	LOCKED ROTOR AMPS	ECH	ELECTRIC CABINET HEATER
LVR	LOUVER	EH	EXHAUST FAN
LVR	LOUVERED DOOR	EUH	ELECTRIC UNIT HEATER
LVG	LEAVING	F	FAN
LWT	LEAVING WATER TEMPERATURE	UH	UNIT HEATER
		VF	VARIABLE FREQUENCY DRIVE
MAX	MAXIMUM	WAC	WINDOW AIR CONDITIONER
MBH	THOUSAND BTUH		
MCA	MINIMUM CIRCUIT AMPS		
MECH	MECHANICAL		
MEZZ	MEZZANINE		
MFR	MANUFACTURER		
MIN	MINIMUM		
MU	MAKE-UP WATER		



CONTROL ABBREVIATIONS	
ALM	ALARM
ATC	AUTOMATIC TEMPERATURE CONTROL
DAT	DISCHARGE AIR TEMPERATURE SENSOR
DDC	DIRECT DIGITAL CONTROL
ES	END SWITCH
FA	FAULT ALARM
HOA	HANDS-OFF AUTOMATIC SWITCH
LAT	LEAVING AIR TEMPERATURE SENSOR
S	SWITCH
SP	STATIC PRESSURE SENSOR
SPD	SPEED CONTROL
S/S	START/STOP
T	TEMPERATURE SENSOR/THERMOSTAT
TR	TEMPERATURE SENSOR/THERMOSTAT (ROOM)
VFDS	VARIABLE FREQUENCY DRIVE SPEED
WC	WATER COLUMN
X	REMOVE EXISTING ITEM



PIPING ABBREVIATIONS

_____ D _____	DRAIN
_____ G _____	NATURAL GAS
_____ RL _____	REFRIGERANT LIQUID
_____ RS _____	REFRIGERANT SUCTION
+++ (NAME) +++	REMOVE EXISTING PIPING

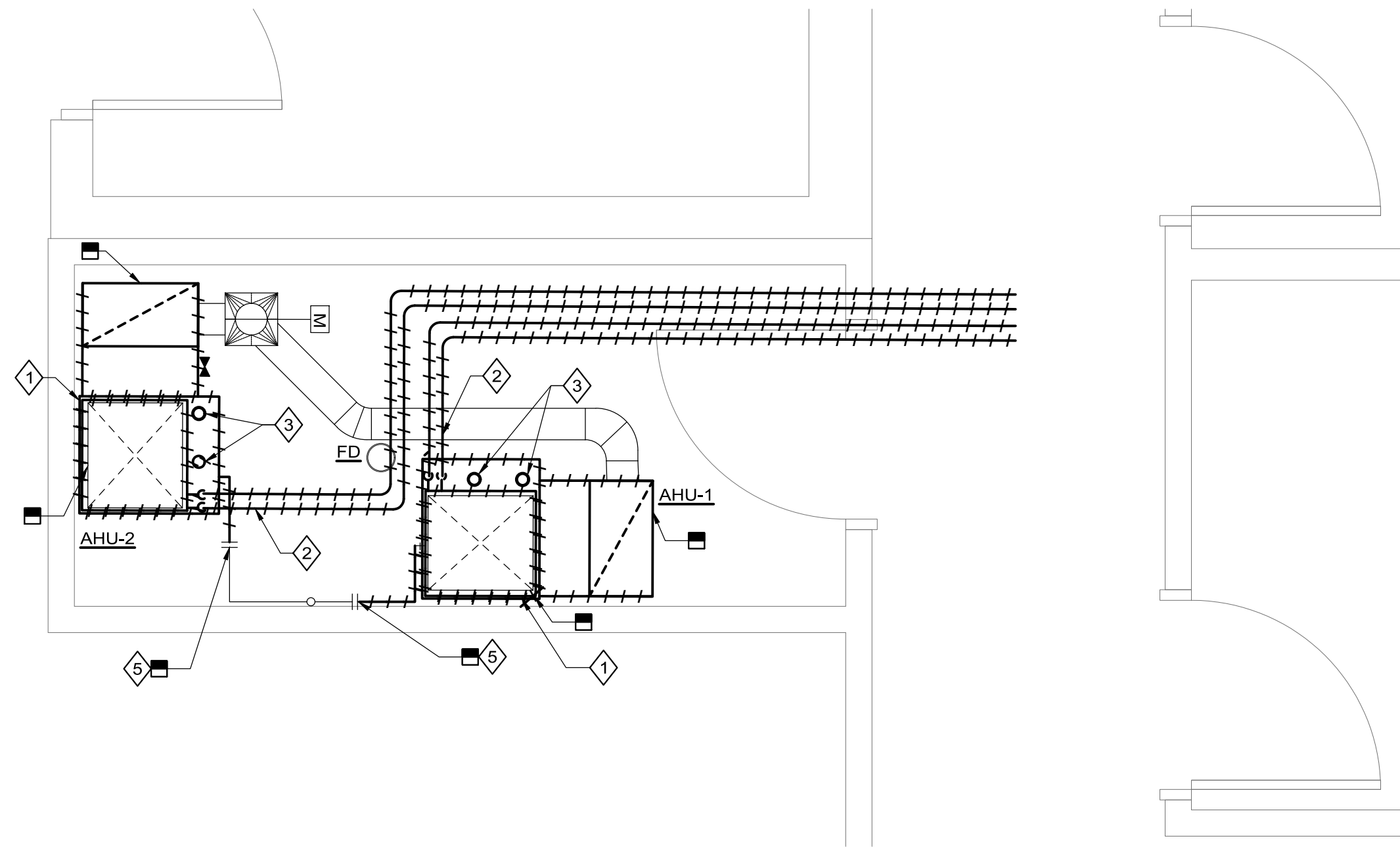
HVAC GENERAL NOTES

1. GENERAL NOTES APPLY TO ALL DRAWINGS.
2. THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. CONTRACTORS, BY SUBMITTING A BID, ARE DEEMED TO BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT INFLUENCES THE WORK DESCRIBED. ABSOLUTELY NO CLAIMS FOR EXTRA COMPENSATION WILL BE CONSIDERED FOR EXISTING CONDITIONS VISIBLE OR REASONABLY INFERABLE FROM A CAREFUL EXAMINATION OF THE EXISTING BUILDING.
3. THIS CONTRACTOR SHALL INSPECT THE EXISTING FIELD CONDITIONS AT THE SITE AND THE "AS-BUILT" BASE BUILDING CONTRACT DOCUMENTS PRIOR TO THE START OF ANY WORK TO DETERMINE WHAT EFFECT THE EXISTING CONDITIONS WILL HAVE ON HIS WORK. ANY POTENTIAL PROBLEM AREAS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND/OR ENGINEER IMMEDIATELY.
4. THIS CONTRACTOR SHALL CONNECT HIS WORK TO VARIOUS EXISTING PIPING, DUCTWORK, AND CONTROL SYSTEMS IN THE BASE BUILDING. THE NEW WORK SHALL BE COMPATIBLE WITH THE EXISTING SYSTEMS. LOCATION OF EQUIPMENT OR THE ROUTING OF THE VARIOUS SYSTEMS AS WELL AS OPENINGS IN FLOOR SLABS OR WALLS SHALL BE GOVERNED BY THE EXISTING CONDITIONS AS THEY APPEAR IN THE FIELD OR ON THE "AS-BUILT" DRAWINGS.
5. CARE SHALL BE TAKEN DURING THE INSTALLATION TO NOT DAMAGE OR INTERRUPT BUILDING SYSTEMS AND SERVICES THAT ARE ALREADY INSTALLED. DAMAGE TO SUCH SYSTEMS OR EQUIPMENT CAUSED BY THIS CONTRACTOR DURING INSTALLATION SHALL BE REPAIRED AND/OR REPLACED AT THIS CONTRACTOR'S EXPENSE TO THE COMPLETE SATISFACTION OF THE BUILDING OWNER.
6. SHUTDOWN OF EXISTING SYSTEMS FOR CONNECTION TO EXISTING SERVICES SHALL BE COORDINATED WITH THE CONSTRUCTION MANAGER OR GENERAL CONTRACTOR AND BUILDING OWNER. THIS CONTRACTOR SHALL SUBMIT REQUESTS, WHERE THEY AFFECT THE OPERATION OF THE BUILDING SYSTEMS, AT LEAST ONE WEEK IN ADVANCE OF ANY REQUIRED SHUTDOWN. THE ACTUAL SHUTDOWN PERIOD SHALL BE AS SHORT AS POSSIBLE AND AT A TIME MUTUALLY AGREEABLE TO THE BUILDING OWNER AND THE CONSTRUCTION MANAGER/GENERAL CONTRACTOR.
7. DRAWINGS ARE DIAGRAMMATIC. THEREFORE DETERMINE EXACT LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD.
8. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AND DUCTS (INCLUDING DISCONNECTS) AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
9. VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. VERIFY AND PROVIDE DUCT AND/OR PIPE TRANSITIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
10. ALL MATERIALS AND EQUIPMENT UNLESS SPECIFICALLY INDICATED AS REUSED, SHALL BE NEW.
11. DUCTWORK SHALL NOT RUN ALONG FULL HEIGHT PARTITIONS.
12. EXISTING ROOM THERMOSTATS AND SENSORS SHALL BE PROTECTED DURING CONSTRUCTION AND RELOCATED AS INDICATED ON THE DRAWINGS. INSTALL NEW AND RELOCATED ROOM THERMOSTATS AND SENSORS 4 FEET AFF OR AS DIRECTED OTHERWISE BY ARCHITECT.
13. WHEN SECTION OF DUCTWORK IS NOT LABELED FOR SIZE, THE LARGER SIZE INDICATED ON THE CONNECTED DUCT SHALL PREVAIL. SIZE OF DUCT RUN-OUTS TO DIFFUSER SHALL EQUAL DIFFUSER NECK SIZE.
14. THE FIRE PROOFING OF THE BUILDING STRUCTURE IS NOT TO BE REMOVED FOR THE INSTALLATION OF HANGERS, SUPPORTS, DUCTWORK, ETC. FIRE PROOFING IS DAMAGED, IT SHALL BE REPAIRED AT THE EXPENSE OF THE TRADE.
15. CONTRACTOR SHALL TEST AND CALIBRATE ALL CONTROLS AND VERIFY ALL ARE FULLY FUNCTIONAL AND SUBMIT DOCUMENTATION. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
16. CONTRACTOR SHALL PROVIDE AND SUBMIT DOCUMENTATION FOR TESTING AND BALANCING OF ALL AIR AND WATER SYSTEMS, DUCT AND PIPING PRESSURE AND LEAKAGE TESTS, OPERATING AND MAINTENANCE MANUALS, AND AS BUILT DRAWINGS. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
17. MANY EQUIPMENT SCHEDULES DO NOT LIST QUANTITIES. CONTRACTOR SHALL REFER TO ALL DRAWINGS AND PROVIDE THE REQUIRED QUANTITIES FOR ALL COMPONENTS.

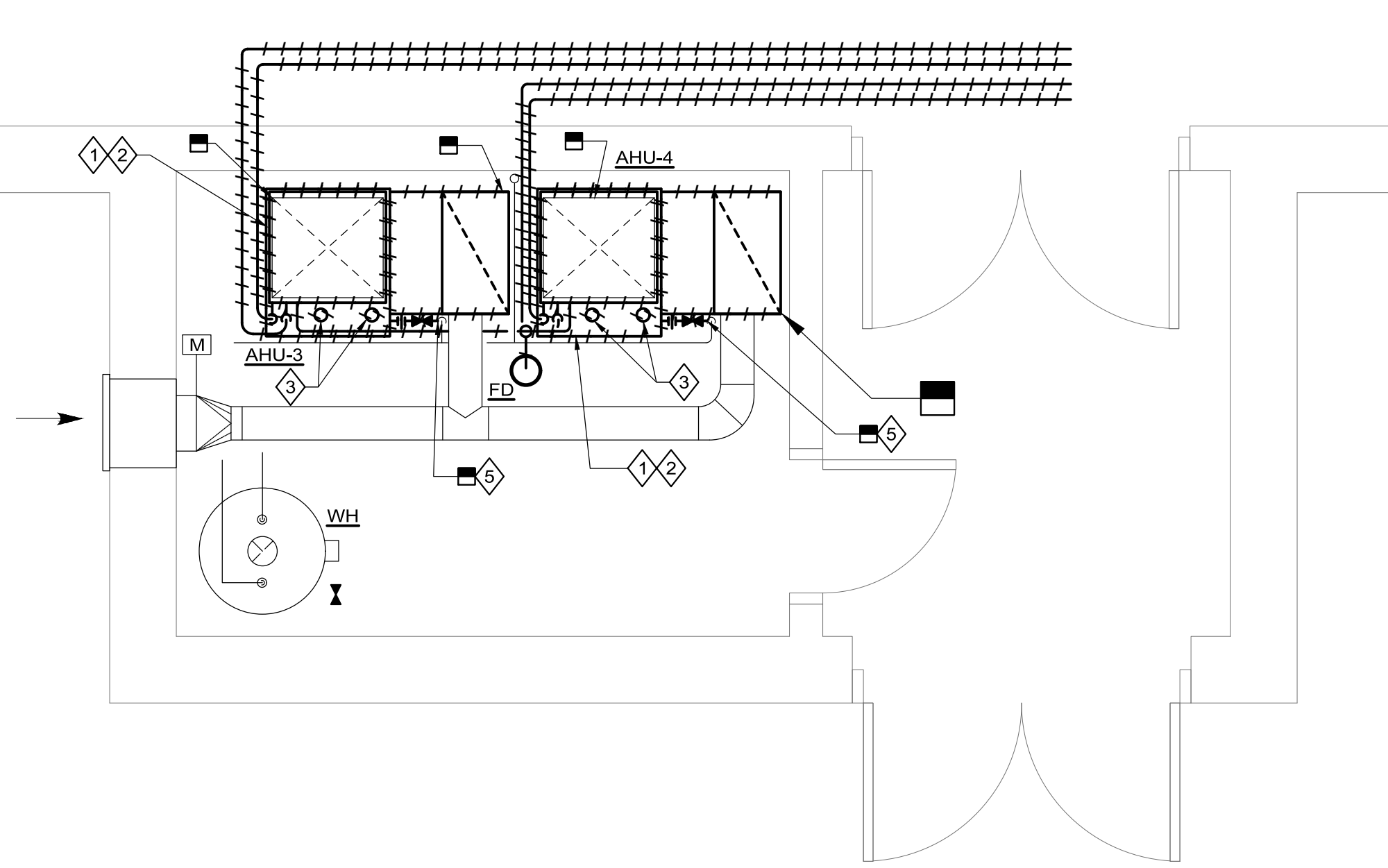
HVAC DEMOLITION NOTES

1. THE LOCATIONS OF EXISTING EQUIPMENT INCLUDING PIPING, DUCTWORK, EQUIPMENT, CONDUITS, ETC ARE SHOWN IN AN APPROXIMATE WAY ONLY. VISIT THE SITE PRIOR TO SUBMISSION OF THE BIDS AND COMMENCEMENT OF WORK TO BECOME FAMILIAR WITH THE ACTUAL CONDITIONS AND EXTENT OF THE WORK.
2. TRACE AND LABEL ALL EXISTING SYSTEMS WITHIN THE DEMOLITION AREA AND BEYOND PRIOR TO DISCONNECTION AND REMOVAL. TO ENSURE THAT NO AREA OUTSIDE THE DEMOLITION AREA IS AFFECTED. REVIEW IN DETAIL WITH THE GENERAL CONTRACTOR AND OWNER WHAT IS TO BE REMOVED AND REMAIN PRIOR TO WORK COMMENCING THE DEMOLITION. THERE SHALL BE NO INTERRUPTION OF SERVICES OUTSIDE THE DEMOLITION AREA WITHOUT APPROVAL FROM THE OWNER'S REPRESENTATIVE.
3. COORDINATE EQUIPMENT REMOVAL WITH ALL PARTIES TO PROVIDE DISCONNECTION. REMOVE EQUIPMENT BY UNFASTENING AT THE SUPPORTS OR ATTACHMENTS. ALSO REMOVE THE ATTACHMENTS FROM THE BUILDING, LEAVING NO COMPONENT OF THE ORIGINAL INSTALLATION.
4. EXERCISE CARE WITH EQUIPMENT THAT IS TO BE RELOCATED OR TURNED OVER TO THE OWNER. EXAMINE THE EQUIPMENT BEFORE REMOVAL IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE TO DETERMINE ITS CONDITION. DELIVER OWNER-RETAINED EQUIPMENT TO AN ON-SITE LOCATION DESIGNATED BY THE OWNER AND OBTAIN ACKNOWLEDGMENT OF RECEIPT IN ORIGINAL CONDITION.
5. INSTALL RELOCATED EQUIPMENT IN ORIGINAL CONDITION ENSURING NO DAMAGE.
6. PROMPTLY REPAIR ANY DAMAGE CAUSED DURING/BY THE EXECUTION OF WORK. DAMAGE INCLUDES BUT IS NOT LIMITED TO DESTRUCTION OF ITEMS INTENDED TO REMAIN OR TO BE SALVAGED.
7. NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY UNANTICIPATED HIDDEN CONDITIONS ENCOUNTERED DURING THE DEMOLITION.
8. ALL ITEMS REMOVED SHALL BE OFFERED TO THE OWNER FOR SALVAGE. IF THE OWNER DOES NOT TAKE POSSESSION, DISPOSE OF THE ITEMS IN A SAFE AND LEGAL MANNER. ALL ITEMS CLASSIFIED AS HAZARDOUS SHALL BE DISPOSED AS HAZARDOUS WASTES AND A UNIFORM HAZARDOUS WASTE MANIFEST SHALL BE PROVIDED TO THE OWNER.
9. ENSURE THE SAFE PASSAGE OF PERSONS IN AND AROUND THE BUILDING DURING DEMOLITION. PREVENT INJURY TO PERSONS AND DAMAGE TO PROPERTY. PROVIDE ADEQUATE SHORING AND BRACING TO PREVENT COLLAPSE. IMMEDIATELY REPAIR DAMAGED PROPERTY TO THE CONDITION BEFORE BEING DAMAGED. TAKE EFFECTIVE MEASURES TO PREVENT WINDBLOWN DUST.
10. DO NOT USE CUTTING TORCHES UNTIL WORK AREA IS CLEARED OF FLAMMABLE MATERIALS. AT CONCEALED SPACES, SUCH AS PIPE INTERIORS OR SHAFTS. VERIFY CONDITION AND CONTENTS OF HIDDEN SPACE BEFORE STARTING FLAME-CUTTING OPERATIONS. MAINTAIN FIRE WATCH AND PORTABLE FIRE-SUPPRESSION DEVICES DURING FLAME-CUTTING OPERATIONS. MAINTAIN ADEQUATE VENTILATION WHEN USING CUTTING TORCHES.
11. DRAIN, PURGE, OR OTHERWISE REMOVE, COLLECT, AND PROPERLY DISPOSE OF CHEMICALS, LIQUIDS, GASES, EXPLOSIVES, ACIDS, FLAMMABLES, OR OTHER DANGEROUS MATERIALS BEFORE PROCEEDING WITH DEMOLITION OPERATIONS.
12. PROPERLY LABEL ALL UNLABELED PIPES THAT REMAIN WITH COLOR PIPE MARKERS AND VALVE TAGS. MOUNT A VALVE AND SERVICES CHART IN THE AREA OF DEMOLITION THAT IDENTIFIES ALL LABELED SERVICES. TURN ONE COPY OF SAME OVER TO THE OWNER.
13. ALL DEMOLITION SCOPE ASSOCIATED WITH LOW VOLTAGE WIRING FOR CONTROLS AND ASSOCIATED INTERLOCKS BE INCLUDED IN THIS CONTRACT.

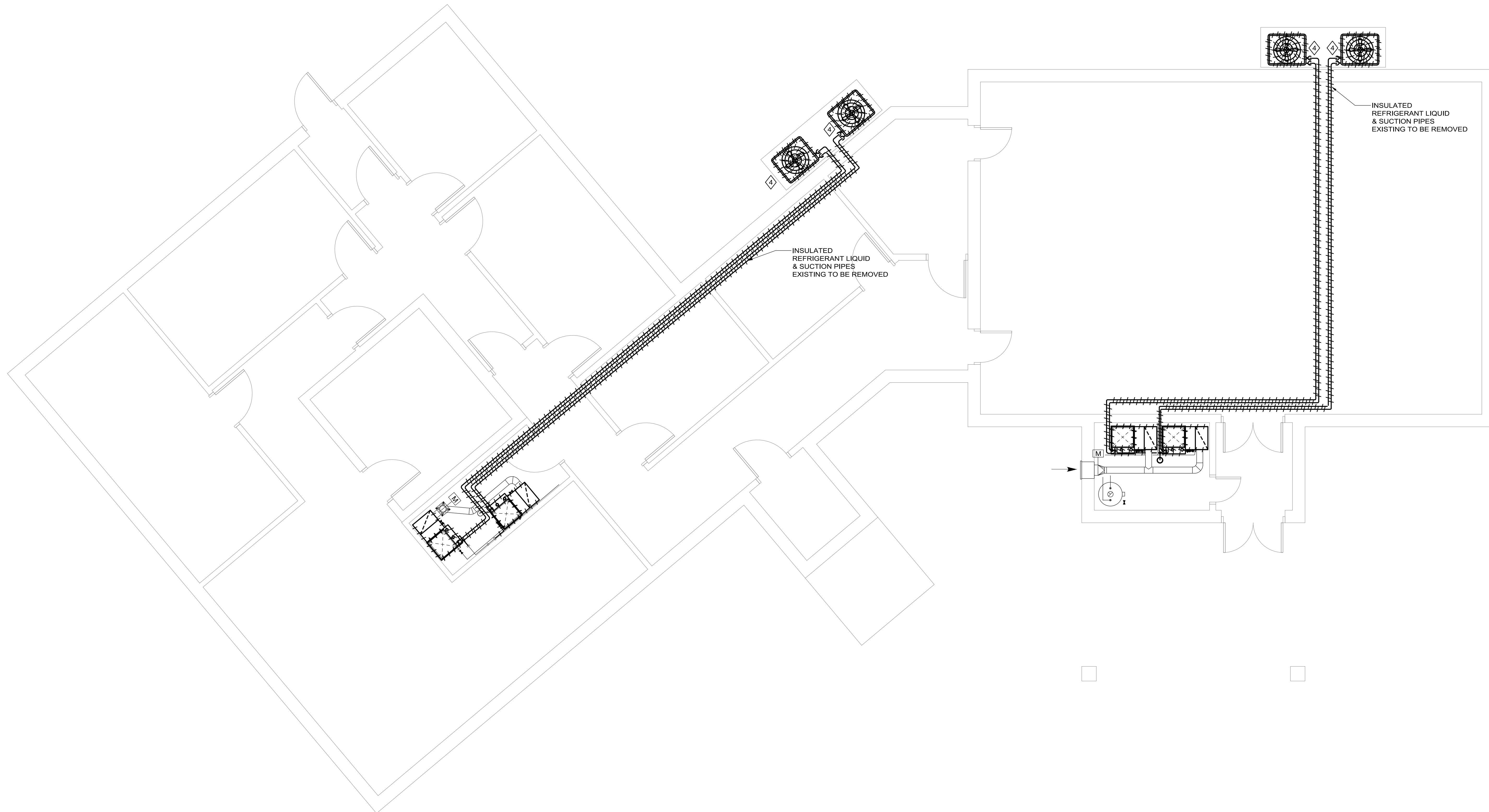
N V 5 200 Bricktown Square Andover, MA 01810-1488 T: 978-296-6200 www.NVE.com		
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100% BID SET 06/26/2026		
THE PROFESSIONAL ENGINEER SHALL APPROVE THIS BIDDY BEFORE ISSUING IT TO THE BIDDING. THE BIDDING SHALL BE RETURNED TO THE ENGINEER WITHIN 10 DAYS OF THE BIDDING. THE BIDDING SHALL BE RETURNED TO THE ENGINEER WITHIN 10 DAYS OF THE BIDDING. THE BIDDING SHALL BE RETURNED TO THE ENGINEER WITHIN 10 DAYS OF THE BIDDING.		
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CITY OF WORCESTER HOPE CEMETERY OFFICE BUILDING HVAC SYSTEM UPGRADE		
119 WEBSTER ST WORCESTER, MA 01603		
KEY PLAN		
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MECHANICAL LEGEND, NOTES AND ABBREVIATIONS		
SHEET NUMBER		
M001		



1 MECHANICAL DEMO PART PLAN RM 020
MD100 1/2"=1'0"



2 MECHANICAL DEMO PART PLAN RM 005
MD100 1/2"=1'0"



3 MECHANICAL DEMOLITION OVERALL PLAN
MD100 1/4"=1'0"

GENERAL NOTES:

- EXISTING CEILING TILES SHALL BE REMOVED TO FACILITATE THE REMOVAL OF THE EXISTING REFRIGERANT PIPING BETWEEN THE CONDENSING UNITS AND MECHANICAL ROOMS. TILES SHALL BE REINSTALLED UPON COMPLETION OF THE NEW WORK PHASE TO ACCOMMODATE THE INSTALLATION OF NEW REFRIGERANT PIPING.
- PRIOR TO THE COMMENCEMENT OF WORK AIRFLOW READINGS SHALL BE TAKEN FOR EACH OF THE FOUR AIR HANDLING UNITS WITHIN THE SCOPE OF WORK. CONTRACTOR SHALL TAKE READINGS OF EACH UNIT'S SUPPLY AIRFLOW, RETURN AIRFLOW, AND VENTILATION AIRFLOW. UPON COMPLETION OF PRECONSTRUCTION READINGS THE CONTRACTOR SHALL SUBMIT THE RESULTS IN A PRE-CONSTRUCTION BALANCING REPORT TO THE ENGINEER FOR REVIEW.
- CONTRACTOR SHALL REMOVE ALL EXISTING REFRIGERANT FROM THE EXISTING AIR CONDITIONING SYSTEMS AND DISPOSE OF ACCORDANCE WITH FEDERAL, STATE, AND LOCAL CODES.

KEY NOTES:

- EXISTING GAS FIRED FURNACE TO BE REMOVED. DISCONNECT EXISTING THERMOSTAT CONTROL WIRING. CUT BACK GAS PIPING AS NECESSARY TO FACILITATE REMOVAL. CUT BACK RETURN AIR DUCTWORK AS NECESSARY TO FACILITATE UNIT REMOVAL. DEMOLISH EXISTING FLUEVENT, & DISCONNECT FROM EXISTING ELECTRICAL SERVICE.
- EXISTING EVAPORATOR COIL TO BE REMOVED IN ITS ENTIRETY. DEMOLISH EXISTING REFRIGERANT PIPING BACK TO CONDENSING UNIT & CUT BACK SUPPLY AIR DUCTWORK AS NECESSARY TO FACILITATE UNIT REMOVAL.
- REMOVE EXISTING FLUINTAKE IN THEIR ENTIRETY.
- EXISTING AIR COOLED CONDENSING UNIT TO BE REMOVED IN ITS ENTIRETY INCLUDING PIPING AND ELECTRICAL WIRING.
- EXISTING GAS PIPING TO BE CUT BACK AS NECESSARY TO FACILITATE REMOVAL OF EXISTING GAS FURNACE.

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BID SET
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THE REPRESENTING ENGINEER HAS REVIEWED THIS BIDDING SET AND CONFIRMS THAT THE MATERIALS AND METHODS SHOWN ON THIS SET OF DRAWINGS REPRESENTS AN OFFER TO CONSTRUCT A PROJECT ACCORDING TO THE PROJECT'S DESIGN. THIS OFFER IS BASED ON THE INFORMATION PROVIDED AND DOES NOT CONSTITUTE A GUARANTEE OF THE PROJECT'S SUCCESS. THE ENGINEER'S REVIEW IS LIMITED TO THE INFORMATION PROVIDED AND DOES NOT CONSTITUTE A GUARANTEE OF THE PROJECT'S SUCCESS.

CLIENT

CONSULTANT

PROJECT NAME

CITY OF WORCESTER
HOPE CEMETERY
OFFICE BUILDING
HVAC SYSTEM
UPGRADE

119 WEBSTER ST
WORCESTER, MA 01603

KEY PLAN



REVISION/ISSUANCE

#	DESCRIPTION	DATE

PROJECT NO.: PROJECT NUMBER

DESIGNED BY: DCG

CHECKED BY: CH

DATE: 06/24/2026

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

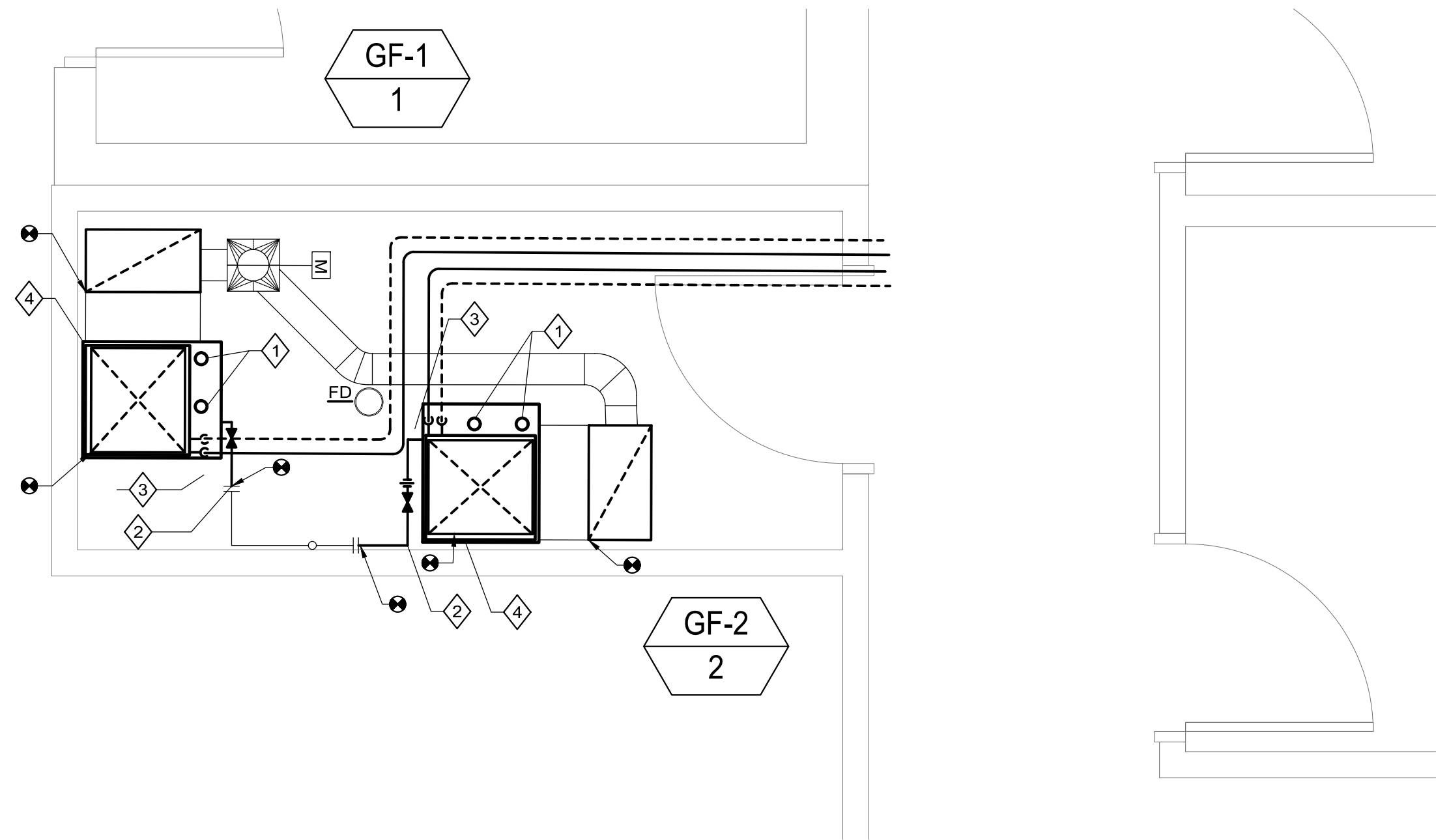
SHEET NAME

MECHANICAL
DEMOLITION PLAN

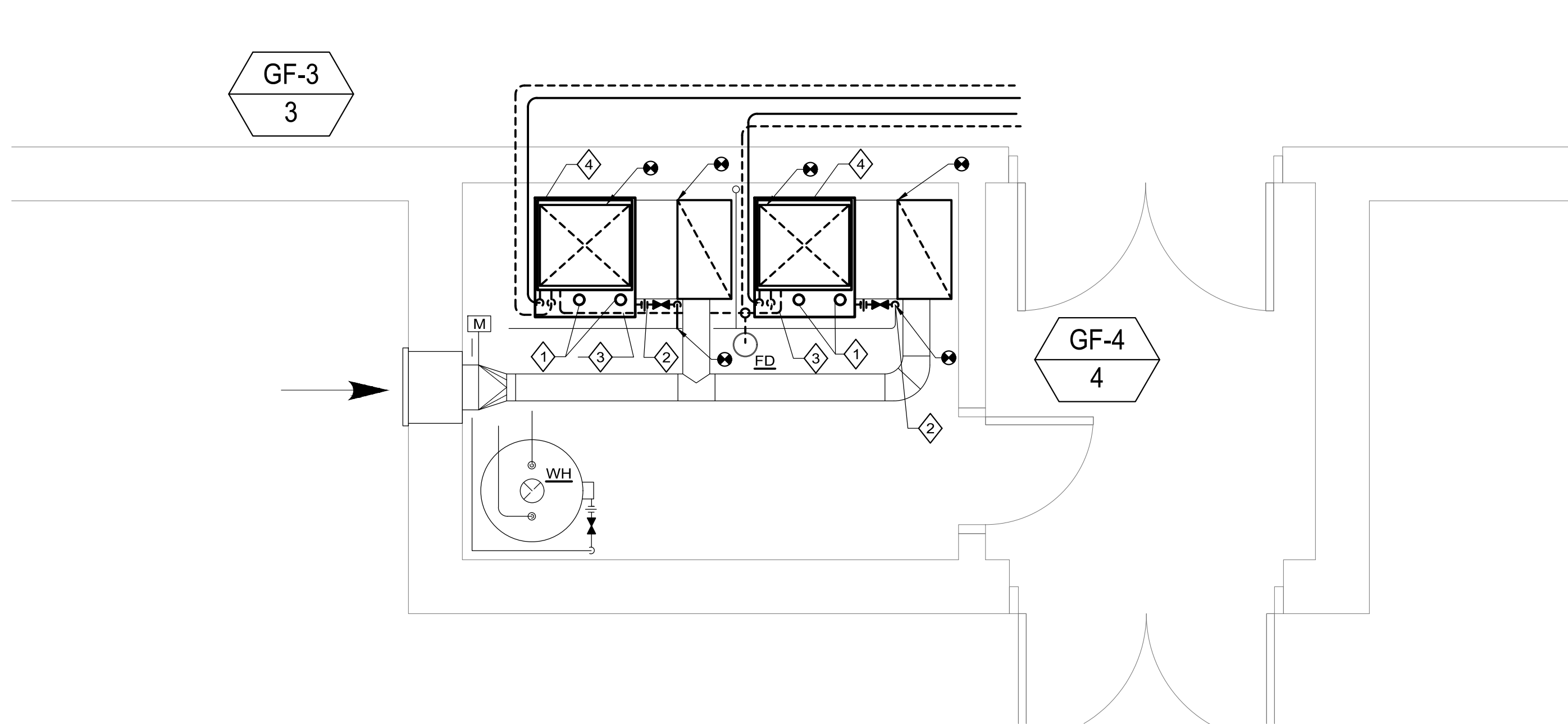
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MD100

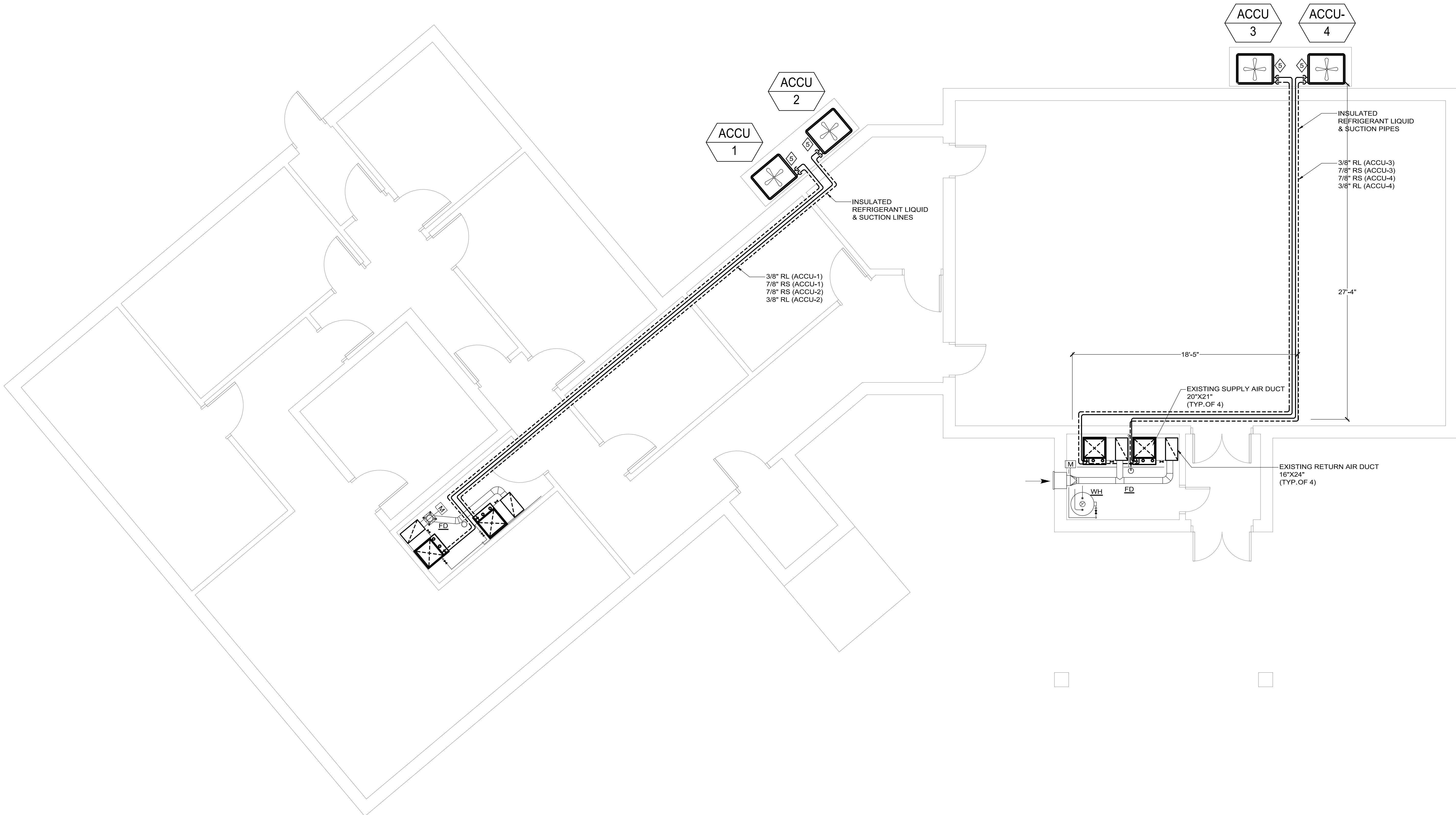
1/4" = 1'-0" 4'-0" 8'-0"



1 MECHANICAL PART PLAN RM 020



2 MECHANICAL PART PLAN RM 005



3 MECHANICAL OVERALL PLAN

- GENERAL NOTES:**
- REINSTALL CEILING TILES REMOVED DURING THE DEMOLITION TILES UPON COMPLETION OF THE INSTALLATION OF NEW REFRIGERANT PIPING.
 - GF-1 THRU GF-4 AIRFLOWS SHALL BE BALANCED BASED ON THE PRE CONSTRUCTION READINGS TAKEN.
- NOTES:**
- PROVIDE COMBUSTION AIR INTAKE AND FLUE EXHAUST PIPING FOR FURNACE. ROUTE PIPING THROUGH ROOF AND TERMINATE WITH APPROVED ROOF CAPS/HOODS. INSTALL IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND APPLICABLE CODES. FLASH ROOF OPENINGS AND SEAL AIR/WATER TIGHT.
 - PROVIDE $\frac{3}{4}$ " NATURAL GAS PIPING TO FURNACE. INSTALL A MANUAL SHUT-OFF VALVE, UNION, AND SEDIMENT TRAP (DRIP LEG) AT THE FURNACE GAS CONNECTION. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS, NFPA 54, AND ALL APPLICABLE CODES.
 - PROVIDE $\frac{3}{4}$ " CONDENSATE DRAIN PIPING FROM BOTH EVAPORATORS. ROUTE PIPING TO FLOOR LEVEL AND CONTINUE TO AN INDIRECT WASTE CONNECTION NEAR THE FLOOR DRAIN. MAINTAIN POSITIVE SLOPE TOWARD DRAIN.
 - INSTALL GAS FIRED FURNACE AND EVAPORATOR COIL PER MANUFACTURER RECOMMENDATIONS. PROVIDE NEW SUPPLY AIR DUCTWORK AND RECONNECT TO EXISTING SUPPLY AIR DUCTWORK. PROVIDE NEW RETURN AIR DUCTWORK WITH FILTER RACK AND RECONNECT TO EXISTING RETURN AIR DUCTWORK. RECONNECT EXISTING THERMOSTAT CONTROL WIRING TO NEW FURNACE CONTROL BOARD.
 - INSTALL NEW AIR COOLED CONDENSING UNIT PER MANUFACTURER RECOMMENDATIONS. MAINTAIN ALL REQUIRED CLEARANCES FOR ACCESS AND SERVICE. NEW CONDENSING UNITS SHALL BE INSTALLED UTILIZING EXISTING CONCRETE PAD.

STAMP

**100%
BID SET**
06/26/2026

CLIENT

CONSULTANT

PROJECT NAME

CITY OF WORCESTER
HOPE CEMETERY
OFFICE BUILDING
HVAC SYSTEM
UPGRADE

119 WEBSTER ST
WORCESTER, MA 01603

KEY PLAN



REVISION/ISSUANCE

#	DESCRIPTION	DATE

PROJECT NO: PROJECT NUMBER

DESIGNED BY: DCG

CHECKED BY: CH

DATE: 06/24/2026

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

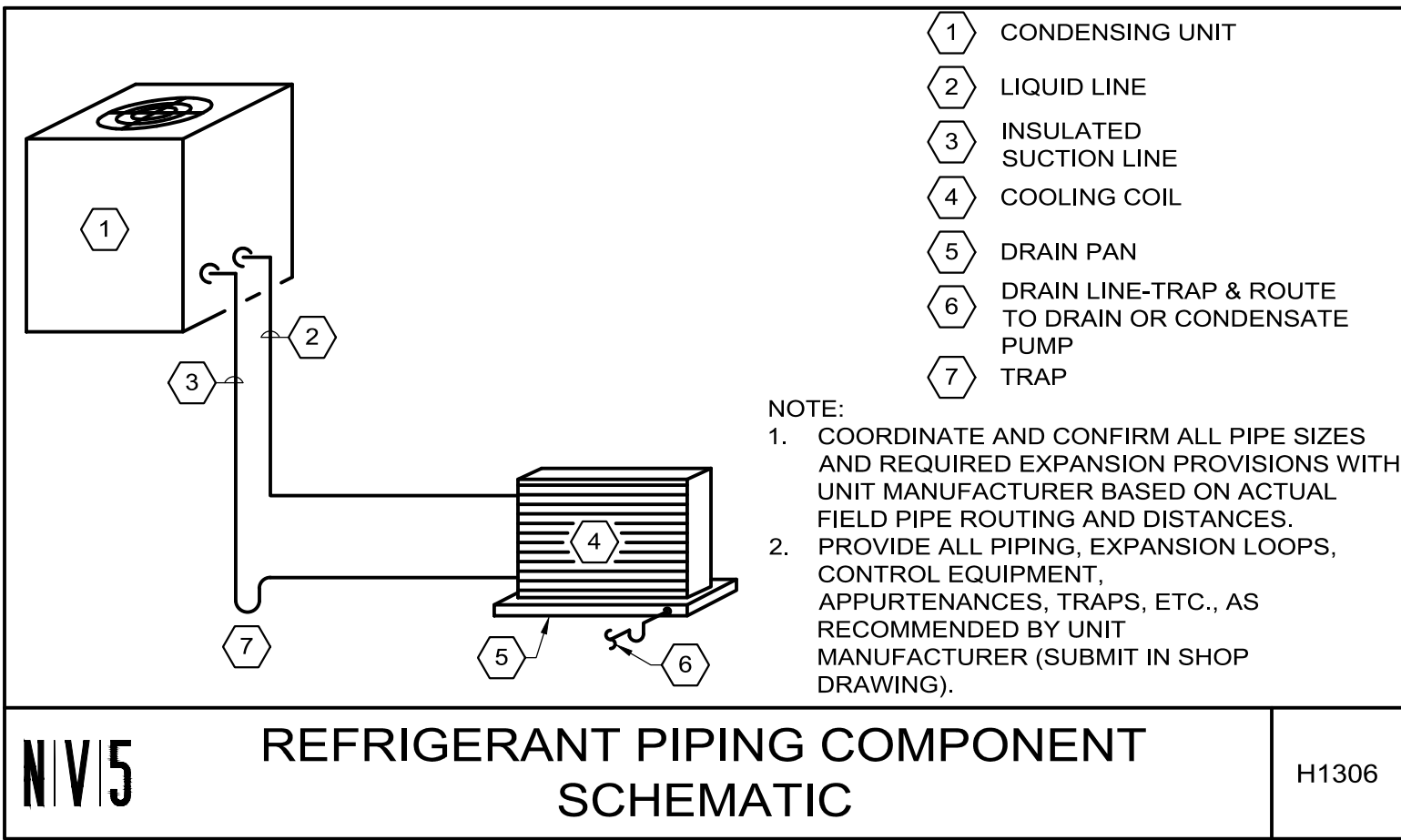
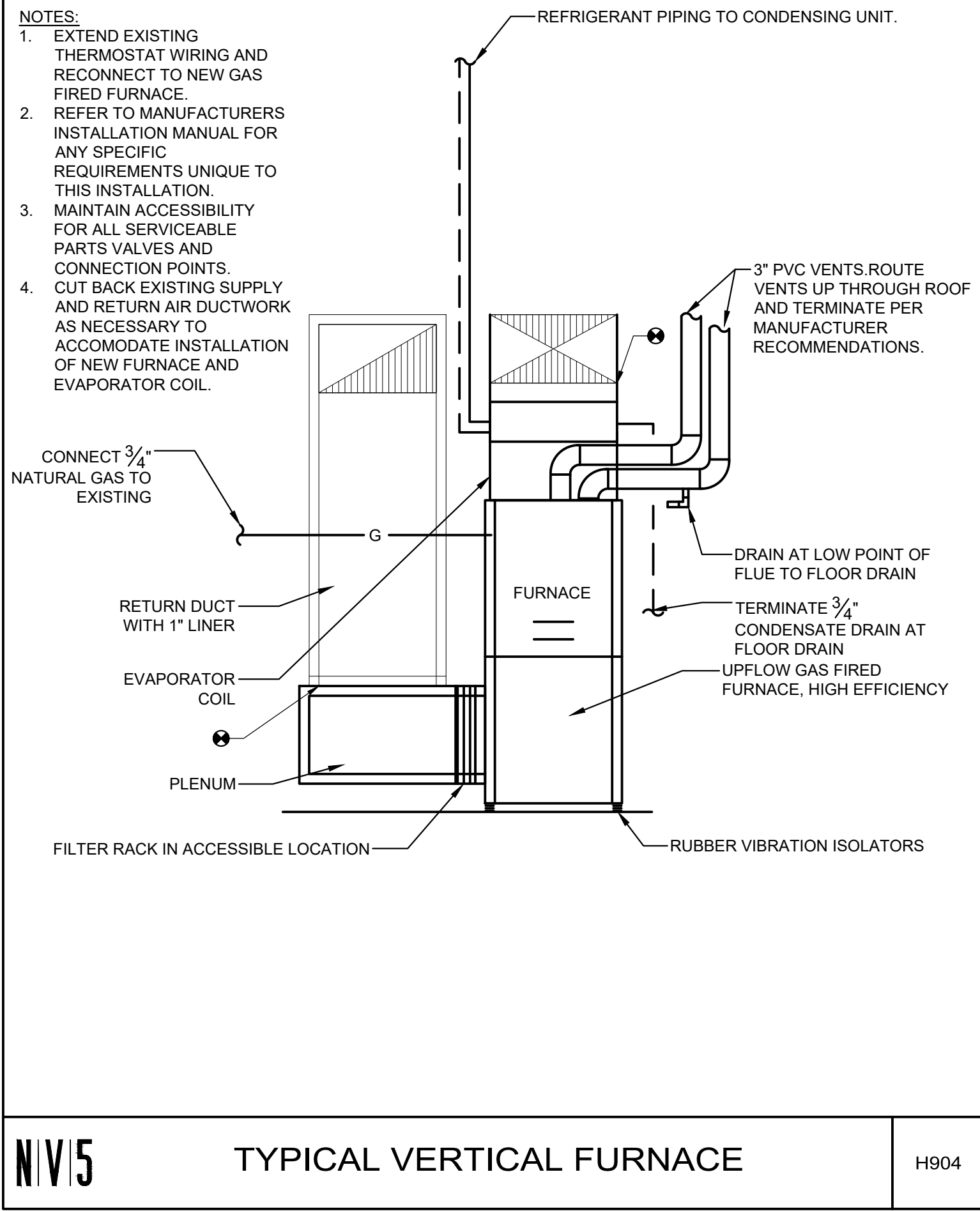
SHEET NAME

MECHANICAL NEW
WORK PLAN

SHEET NUMBER

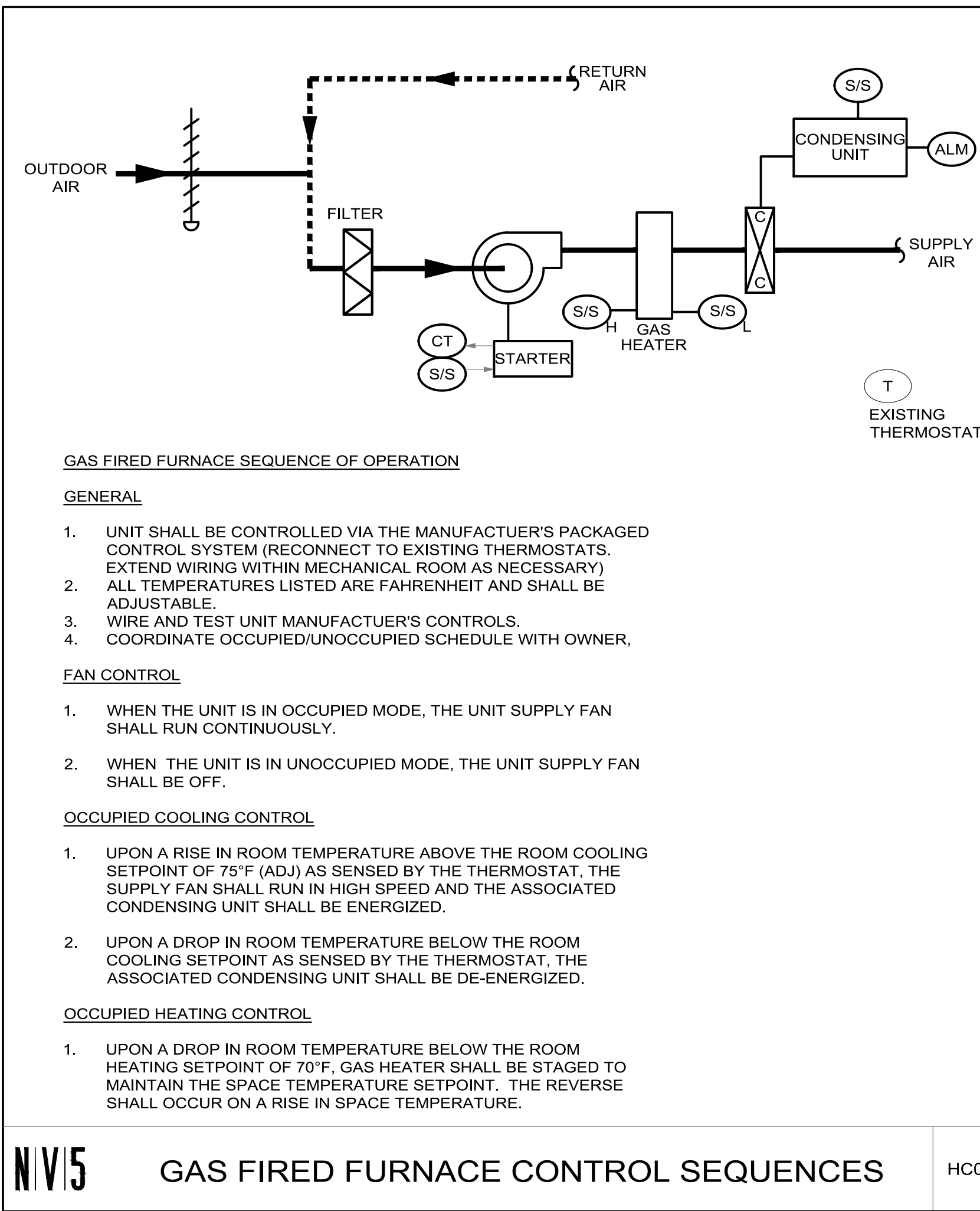
M100

1/4" = 1'-0" 4'-0" 8'-0"



GAS FIRED FURNACE SCHEDULE																		
TAG	SERVICE	LOCATION	CFM		ESP	FAN MOTOR HP	DX COOLING		GAS HEATING			ELECTRICAL					MANUFACTURER AND MODEL NUMBER (AS STANDARD)	REMARKS
			TOTAL	MIN. O.A.			TOTAL MBH	SENS MBH	INPUT MBH	OUTPUT MBH	EFFICIENCY	V	PH	HZ	MCA	MOCP		
GF-1	OFFICE	MECH RM 020	1500	100	0.8	1	46.4	32.3	100	95	95%	115	1	60	13.1	15	FRASER JOHNSTON /TLE9100C20UH11	
GF-2	OFFICE	MECH RM 020	1500	100	0.8	1	46.4	32.3	100	95	95%	115	1	60	13.1	15	FRASER JOHNSTON /TLE9100C20UH11	
GF-3	COMMONS 002	MECH 005	1500	100	0.8	1	46.4	32.3	100	95	95%	115	1	60	13.1	15	FRASER JOHNSTON /TLE9100C20UH11	
GF-4	COMMONS 002	MECH 005	1500	100	0.8	1	46.4	32.3	100	95	95%	115	1	60	13.1	15	FRASER JOHNSTON /TLE9100C20UH11	
NOTES: 1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DRAWINGS FOR ADDITIONAL INFORMATION. 2. PROVIDE WITH FRASER-JOHNSTON CTF4C5GFS1 EVAPORATOR COIL WITH FACTORY INSTALLED TXV, AND CORROSION RESISTANT DRAIN PAN DESIGNED OF A POLYBUTYLENE TEREPHTHALATE MATERIAL AND PROVIDED WITH WATER-TIGHT DRAIN PLUGS. 3. UNIT SHALL UPRIGHT DESIGN FOR UPFLOW VERTICAL INSTALLATION. 4. PROVIDE WITH VARIABLE SPEED BLOWER, TWO-SPEED INDUCER MOTOR, AND TWO-STAGE GAS VALVE. 5. PROVIDE WITH ADJUSTABLE BLOWER SPEED FOR COOLING, CONTINUOUS FAN, AND DEHUMIDIFICATION. 6. PROVIDE WITH ALUMINIZED-STEEL PRIMARY HEAT EXCHANGER. 7. PROVIDE WITH STAINLESS-STEEL CONDENSING SECONDARY HEAT EXCHANGER. 8. PROVIDE WITH FULLY-INSULATED CASING INCLUDING BLOWER SECTION. 9. UNIT SHALL BE DIRECT-VENT/SEALED COMBUSTION, SINGLE PIPE VENTING OR VENTILATED COMBUSTION AIR. 10. PROVIDE WITH FACTORY MOUNTED MICRO-PROCESSOR BASED ELECTRONIC CONTROLS.																		

AIR-COOLED CONDENSING UNIT SCHEDULE														
TAG	SERVICE	LOCATION	REFRIGERANT		D.B. TEMP. (°F)		ELECTRIC SERVICE					MIN. EFFICIENCY SEER2	MANUFACTURER AND MODEL NUMBER (AS STANDARD)	REMARKS
			TYPE	CHARGE (LBS)			V	PH	HZ	MCA	MOCp			
					MIN	MAX								
ACCU-1	AHU-1	SEE PLANS	R-454B	3.25	46	95	208	1	60	29.3	50	13.5	FRAER JOHNSTON / XC348E2S11	
ACCU-2	AHU-2	SEE PLANS	R-454B	3.25	46	95	208	1	60	29.3	50	13.5	FRAER JOHNSTON / XC348E2S11	
ACCU-3	AHU-3	SEE PLANS	R-454B	3.25	46	95	208	1	60	29.3	50	13.5	FRAER JOHNSTON / XC348E2S11	
ACCU-4	AGH-4	SEE PLANS	R-454B	3.25	46	95	208	1	60	29.3	50	13.5	FRAER JOHNSTON / XC348E2S11	
NOTES:														
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DRAWINGS FOR ADDITIONAL INFORMATION.														
2. PROVIDE WITH HIGH PRESSURE SWITCH.														
3. PROVIDE WITH DISCHARGE AND SUCTION PRESSURE TRANSDUCER.														
4. PROVIDE WITH TXV FOR COOLING.														
5. PROVIDE WITH FILTER DRIER (FIELD INSTALLED).														
6. PROVIDE WITH INTERNAL CRANKCASE HEATER.														
7. UNIT SHALL BE INSTALLED PER MANUFACTURER RECOMMENDATIONS - MAINTAIN ALL REQUIRED CLEARANCES FOR ACCESS AND SERVICE.														
8. REFRIGERANT PIPING SHALL BE SIZED PER MANUFACTURER'S RECOMMENDATIONS. VERIFY PIPING LENGTHS AND ROUTING PRIOR TO INSTALLATION.														
9. PROVIDE WITH RUBBER ISOLATION PADS.														
10. PROVIDE WITH DISCONNECT SWITCH AND STARTER.														
11. COORDINATE ELECTRICAL REQUIREMENTS WITH ELECTRICAL CONTRACTOR.														



NV5

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Andover, MA 01810-1488
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STAMP

100%
BID SET
06/26/2026

THE REPRESENTING ENGINEER HAS REVIEWED THIS BIDDING SET AND IS NOT PROVIDING ANY GUARANTEE OR WARRANTY FOR THE MATERIALS AND METHODS SHOWN ON THIS BIDDING SET. ALL BIDDING SETS ARE SUBJECT TO THE TERMS AND CONDITIONS OF THE BIDDING SET. THE BIDDING SET IS NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN CONSENT OF THE ENGINEER.

CLIENT

CONSULTANT

PROJECT NAME

CITY OF WORCESTER
HOPE CEMETERY
OFFICE BUILDING
HVAC SYSTEM
UPGRADE

119 WEBSTER ST
WORCESTER, MA 01603

KEY PLAN

REVISION/ISSUANCE

#	DESCRIPTION	DATE

PROJECT NO: PROJECT NUMBER
DESIGNED BY: DCG
CHECKED BY: CH
DATE: 06/24/2026
SCALE: NTS

SHEET NAME

MECHANICAL
DETAILS,
CONTROLS, &
SCHEDULES

SHEET NUMBER

M601

ELECTRICAL DEMOLITION NOTES

1. REFER TO THE MECHANICAL DRAWINGS FOR THE EXTENT OF THE DEMOLITION SCOPE OF WORK AND AREA. THE DEMOLITION PLANS INDICATE THE GENERAL INTENT AND ARE NOT INTENDED TO SHOW ALL ITEMS TO BE REMOVED OR RETAINED. THE ENTIRE SCOPE MAY EXTEND BEYOND THE AREA DELINEATED BY THE MECHANICAL ARCHITECTURAL DEMOLITION LIMITS TO FULLY COMPLY WITH VARIOUS REQUIREMENTS OF THE CONTRACT DOCUMENTS.
2. THE ELECTRICAL DEMOLITION PLANS ARE NOT INTENDED TO SHOW ALL ITEMS TO BE REMOVED OR RETAINED. NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY UNANTICIPATED HIDDEN CONDITIONS ENCOUNTERED DURING THE DEMOLITION.
3. PERFORM ELECTRICAL DEMOLITION WORK AS SHOWN ON THE DRAWINGS AND AS SPECIFIED IN COOPERATION WITH THE OTHER TRADES AND AS SCHEDULED AND APPROVED BY THE OWNER'S REPRESENTATIVE. DISCONNECT AND MAKE SAFE ALL ELECTRICAL EQUIPMENT IDENTIFIED FOR REMOVAL ON THE ELECTRICAL AND HVAC PLANS.
4. THE LOCATIONS OF EXISTING EQUIPMENT INCLUDING PIPING, DUCTWORK, EQUIPMENT, CONDUITS, ETC ARE SHOWN IN AN APPROXIMATE WAY ONLY. VISIT THE SITE PRIOR TO SUBMISSION OF THE BIDS AND COMMENCEMENT OF WORK TO BECOME FAMILIAR WITH THE ACTUAL CONDITIONS AND EXTENT OF THE WORK.
5. POWER OUTAGES CAUSED BY DEMOLITION THAT AFFECT OTHER AREAS SHALL BE HELD TO A MINIMUM. SHUTDOWNS SHALL BE COORDINATED WITH USERS AND THE OWNER, NIGHT, WEEKEND, AND/OR HOLIDAY TIME REQUIRED TO PERFORM ELECTRICAL DEMOLITION WORK OR NEW ELECTRICAL WORK SHALL BE CARRIED AS PART OF THE CONTRACT COST.
6. CIRCUIT TRACE AND LABEL ALL EXISTING BRANCH CIRCUITS AND FEEDERS WITHIN THE AREA OF DEMOLITION SCOPE PRIOR TO DE-ENERGIZING AND DISCONNECTION. THERE SHALL BE NO INTERRUPTION OF SERVICES OUTSIDE THE DEMOLITION AREA WITHOUT APPROVAL FROM THE OWNER'S REPRESENTATIVE.
7. DE-ENERGIZE AND REMOVE ALL CONDUCTORS AND RACEWAYS TO THEIR POINTS OF ORIGIN WITHIN THE AREA OF DEMOLITION SCOPE. ITEMS IDENTIFIED FOR DEMOLITION SHALL NOT BE ABANDONED IN PLACE. RACEWAYS THAT ENTER MASONRY WALLS AND CEILING SHALL BE CUT FLUSH AT THE INTERFACE FOR PATCHING BY OTHERS. ALL CIRCUIT BREAKERS ASSOCIATED WITH THE DEMOLITION SCOPE SHALL BE DE-ENERGIZED AND LABELED SPARE.
8. PROMPTLY REPAIR ANY DAMAGE CAUSED DURING/BY THE EXECUTION OF WORK. DAMAGE INCLUDES BUT IS NOT LIMITED TO DESTRUCTION OF ITEMS INTENDED TO REMAIN OR TO BE SALVAGED.
9. EXERCISE CARE WITH EQUIPMENT THAT IS TO BE RELOCATED OR TURNED OVER TO THE OWNER. EXAMINE THE EQUIPMENT BEFORE REMOVAL IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE TO DETERMINE ITS CONDITION. DELIVER OWNER-RETAINED EQUIPMENT TO AN ON-SITE LOCATION DESIGNATED BY THE OWNER AND OBTAIN ACKNOWLEDGMENT OF RECEIPT IN ORIGINAL CONDITION.
10. ALL ITEMS REMOVED SHALL BE OFFERED TO THE OWNER FOR SALVAGE. IF THE OWNER DOES NOT TAKE POSSESSION, DISPOSE OF THE ITEMS IN A SAFE AND LEGAL MANNER. ALL ITEMS NOT OFFERED AS SALVAGE OR HAZARDOUS SHALL BE DISPOSED AS HAZARDOUS WASTES AND A UNIFORM HAZARDOUS WASTE MANIFEST SHALL BE PROVIDED TO THE OWNER.
11. ENSURE THE SAFE PASSAGE OF PERSONS IN AND AROUND THE BUILDING DURING DEMOLITION. PREVENT INJURY TO PERSONS AND DAMAGE TO PROPERTY. PROVIDE ADEQUATE SHORING AND BRACING TO PREVENT COLLAPSE. IMMEDIATELY REPAIR DAMAGED PROPERTY TO THE CONDITION BEFORE BEING DAMAGED. TAKE EFFECTIVE MEASURES TO PREVENT WINDBLOWN DUST.
12. THE EXISTING FIRE ALARM SYSTEM SHALL REMAIN FULLY FUNCTIONAL DURING THE ENTIRE DEMOLITION AND CONSTRUCTION PERIOD. REUSE OF EXISTING FIRE ALARM SYSTEM, RACEWAYS, NOT BE ALLOWED. ALL REQUIRED SYSTEM SHUTDOWNS SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER'S REPRESENTATIVE AND THE AUTHORITY HAVING JURISDICTION. DEMOLITION OF THE EXISTING SYSTEM SHALL NOT COMMENCE UNTIL THE NEW SYSTEM HAS BEEN COMPLETELY INSTALLED, TESTED AND APPROVED BY THE AUTHORITY HAVING JURISDICTION.
13. CREATE AND SUBMIT IMPAIRMENT PLANS TO THE OWNER AND AHJ IF ANY PORTION OF THE EXISTING FIRE ALARM SYSTEM IS TAKEN OUT OF SERVICE DURING THE EXECUTION OF THE PROJECT.

MOTOR & CONTROLS LEGEND	
	DISCONNECT SWITCH RATED 30AMP, 3-POLE, IN NEMA TYPE 1 ENCLOSURE, UNLESS OTHERWISE NOTED "3R" - INDICATES NEMA TYPE 3R ENCLOSURE "2P" - INDICATES 2-POLE SINGLE PHASE DISCONNECT "60A" - INDICATES 60A SWITCH
	FUSED DISCONNECT SWITCH, 3-POLE, IN NEMA TYPE 1 ENCLOSURE, UNLESS OTHERWISE NOTED "3R" - INDICATES NEMA TYPE 3R ENCLOSURE "60AS" - INDICATES 60AMP SWITCH "50AF" - INDICATES 50AMP FUSES
	EQUIPMENT TAG, TOP ALPHANUMERIC CORRESPONDS TO EQUIPMENT ID. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION.

EXISTING EQUIPMENT LEGEND	
XM	EXISTING EQUIPMENT TO REMAIN
X	EXISTING EQUIPMENT TO BE REMOVED
XR	EXISTING EQUIPMENT TO BE RELOCATED
XN	NEW LOCATION OF EXISTING RELOCATED EQUIPMENT
NR	EXISTING EQUIPMENT TO BE REMOVED AND NEW EQUIPMENT TO BE INSTALLING ON EXISTING BENCH/REEFER
	EXISTING EQUIPMENT FOR INFORMATION ONLY - INDICATED BY SYMBOL WITH LIGHT AND OUT OF FUNCTION LINE TYPE
	EXISTING EQUIPMENT TO BE REMOVED- INDICATED BY SYMBOL WITH DASHED AND IN FUNCTION LINE TYPE

WIRING DEVICE LEGEND	
	DUPLEX RECEPTACLE, GROUNDING TYPE, RATED 20A, 125V "5"- INDICATES CIRCUIT NUMBER "GFI"- INDICATES INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER "WP" - INDICATES WEATHERPROOF

BRANCH CIRCUIT & FEEDER LEGEND	
————	BRANCH CIRCUIT OR FEEDER CONCEALED IN FINISHED AREAS
-----	BRANCH CIRCUIT OR FEEDER, CONCEALED IN OR UNDER FLOOR SLAB
—○—	BRANCH CIRCUIT OR FEEDER TURNING UP TOWARDS OBSERVER
—●—	BRANCH CIRCUIT OR FEEDER TURNING DOWN AWAY FROM OBSERVER
—┐	CONDUIT STUBBED ABOVE CEILING

POWER DISTRIBUTION	
—	208Y/120 VOLT PANELBOARD, SURFACE MOUNTED REFER TO PANELBOARD SCHEDULE

ABBREVIATIONS			
A/AMP	AMPERE	KWH	KILOWATT HOURS
AC	ALTERNATING CURRENT	LTG	LIGHTING
ADA	AMERICAN WITH DISABILITIES ACT	MCB	MAIN CIRCUIT BREAKER
AF	AMPERE FRAME	MEC	MASSACHUSETTS ELECTRICAL CODE
AFB	ABOVE FINISHED FLOOR	M/G	MOTOR/GENERATOR SET
AFG	ABOVE FINISHED GRADE	MH	MANHOLE
AIC	AMPERE INTERRUPTING CAPACITY	MLO	MAIN LUGS ONLY
AL	ALUMINUM	MTD	MOUNTED
AT	AMPERE TRIP	MTG	MOUNTING
ATS	AUTOMATIC TRANSFER SWITCH	NC	NORMALLY CLOSED CONTACT
AWG	AMERICAN WIRE GAUGE	NEC	NATIONAL ELECTRICAL CODE
B	BURIED	NO	NORMALLY OPEN CONTACT
C	CONDUIT	NTS	NOT TO SCALE
CA	CABLE	#	NUMBER
CATV	CABLE TELEVISION	OPD	OVER CURRENT PROTECTION DEVICE
CCTV	CLOSED CIRCUIT TELEVISION SYSTEM	POS	PROVIDED UNDER OTHER SECTIONS
CB	CIRCUIT BREAKER	PVC	POLYVINYL CHLORIDE
CKT	CIRCUITS	PWR	POWER
CPU	CENTRAL PROCESSING UNIT	RGS	RIGID GALVANIZED STEEL
CL	CENTERLINE	RMS	ROOT MEAN SQUARE VALUE
dB	DECIBEL	RPM	REVOLUTIONS PER MINUTE
DC	DIRECT CURRENT	SPD	SURGE PROTECTIVE DEVICE
DWG	DRAWING	SN	SOLID NEUTRAL
EC	ELECTRICAL CONTRACTOR	SWBD	SWITCHBOARD
EMT	ELECTRIC METALLIC TUBING	TB	TERMINAL BLOCK
FDR	FEEDER	TEL	TELEPHONE
FLMT	FLEXIBLE LIQUID TIGHT METALLIC TUBING	TERMN	TERMINAL
FREQ	FREQUENCY	TSP	TWISTED SHIELDED PAIR
GEQ	GROUNDING ELECTRODE	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSER
GFI	GROUND FAULT INTERRUPTING	TYP	TYPICAL
GND	GROUND	UG	UNDERGROUND
HH	HANDHOLE	UNO	UNLESS NOTED OTHERWISE
HP	HORSEPOWER	UPS	UNINTERRUPTIBLE POWER SUPPLY
HVC	HEATING, VENTILATING AND AIR CONDITIONING	UTP	UNSHIELDED TWISTED-PAIR
HZ	HERTZ	V	VOLTS
IG	ISOLATED GROUND	VA	VOLT-AMPERE
JB	JUNCTION BOX	VSD	VARIABLE SPEED DRIVE
KV	KILOVOLT-AMPERE	W	WATTS
KWA	KILOWATT	WP	WEATHERPROOF



STAMP

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BID SET**
06/26/2026

THE PROFESSIONAL ENGINEER SEAL AFFIXED TO THIS SHEET APPLIES ONLY TO THE MATERIAL AND ITEMS SHOWN ON THIS SHEET. ALL DRAWINGS, INSTRUMENTS OR OTHER DOCUMENTS NOT CARRYING THIS SEAL SHALL NOT BE CONSIDERED PREPARED BY THIS ENGINEER, AND THIS ENGINEER EXPRESSLY DISCLAIMS ANY AND ALL RESPONSIBILITY FOR SUCH PLAN, DRAWING OR DOCUMENT NOT BEING THIS SEAL.

CLIENT

CONSULTANT

PROJECT NAME

CITY OF WORCESTER

HOPE CEMETERY OFFICE BUILDING HVAC SYSTEM UPGRADE

119 WEBSTER ST
WORCESTER, MA 01603

KEY PLAN

REVISION/ISSUANCE

[illegible]

PROJECT NO.: _____ PROJECT NUMBER _____

DESIGNED BY: _____

CHECKED BY: _____

DATE: 06.24.2020

SCALE: _____ NTS

SHEET NAME

ELECTRICAL LEGEND, NOTES AND ABBREVIATIONS

SHEET NUMBER

E001

STAMP

100%
BID SET
06/26/2026

THE REPRESENTED OWNER HAS REVIEWED THIS BIDDING SET ONLY FOR THE MATERIALS AND METHODS SPECIFIED IN THE BIDDING SET. THE BIDDING SET IS NOT A CONTRACT DOCUMENT AND DOES NOT CONSTITUTE A CONTRACT. THE BIDDING SET IS NOT A CONTRACT DOCUMENT AND DOES NOT CONSTITUTE A CONTRACT.

CLIENT

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CITY OF WORCESTER
HOPE CEMETERY
OFFICE BUILDING
HVAC SYSTEM
UPGRADE119 WEBSTER ST
WORCESTER, MA 01603

KEY PLAN



REVISION/ISSUANCE

#	DESCRIPTION	DATE

PROJECT NO: _____ PROJECT NUMBER
DESIGNED BY: _____ MVM
CHECKED BY: _____ DJC
DATE: _____ 06/24/2026
SCALE: _____ 1/4" = 1'-0"

SHEET NAME

ELECTRICAL
NEW WORK PLAN

SHEET NUMBER

E100

NOTES:

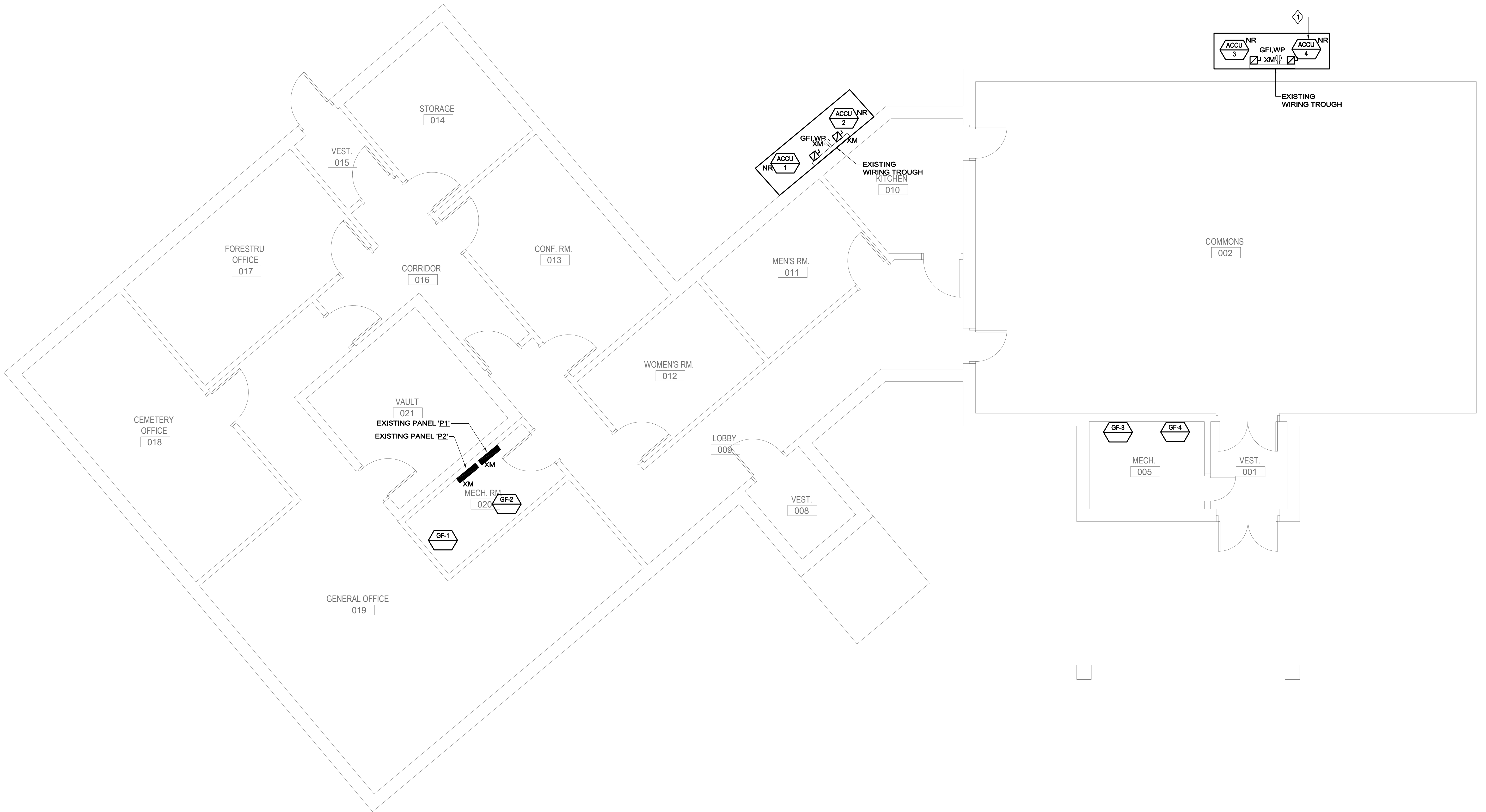
1. REFER TO DRAWING E001 FOR LEGEND, SYMBOLS AND GENERAL NOTES.
2. REFER TO ARCHITECTURAL DRAWINGS FOR ASSOCIATED NOTES, MOUNTING DETAILS, HEIGHTS AND EXACT LOCATIONS OF ALL DEVICES.
3. CIRCUIT NUMBERS DENOTE CIRCUITING INTENT. EXACT NUMBER DESIGNATIONS SHALL BE DETERMINED IN THE FIELD AND REFLECTED ON THE AS BUILT DRAWINGS. INTERCONNECTING BRANCH WIRING SHALL BE SIZED EQUAL TO THE HOMERUN UNLESS NOTED OTHERWISE.
4. VOLTAGE DROP HAS BEEN CONSIDERED IN THE DESIGN OF ALL BRANCH CIRCUITRY AND FEEDER SIZES BASED ON EQUIPMENT LAYOUTS AND SHORTEST CONDUCTOR/RACEWAY ROUTING. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR DEVIATIONS TAKEN THAT WILL INCREASE CONDUCTOR/RACEWAY LENGTHS. BRANCH CIRCUITS LONGER THAN 75' FOR 120V FROM PANEL TO LAST OUTLET SHALL BE INCREASED A MINIMUM OF ONE SIZE ABOVE THAT SPECIFIED TO LIMIT VOLTAGE DROP TO LESS THAN 3%. FEEDERS SHALL FOLLOW SIMILAR GUIDELINES AND BE LIMITED TO A 2% DROP.
5. POWER BRANCH CIRCUITRY SHALL BE INSTALLED IN CONDUIT FROM THE PANEL TO THE FIRST DEVICE AND/OR WHERE EXPOSED, POWER BRANCH CIRCUITRY MAY BE TYPE MC CABLE WHERE CONCEALED ABOVE SUSPENDED CEILINGS AND IN METAL STUD WALLS.
6. MAINTAIN CONTINUITY OF BRANCH CIRCUITRY ASSOCIATED WITH ALL EXISTING POWER DEVICES TO REMAIN.

KEYNOTES

RECONNECT/EXTEND EXISTING BRANCH CIRCUIT WIRING/CONDUIT TO NEW UNIT AS REQUIRED. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION.

NOTES:

- 1 REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.



1 ELECTRICAL NEW WORK PLAN
E100 1/4"=1'-0"

1/4" = 1'-0" 4'-0" 8'-0"

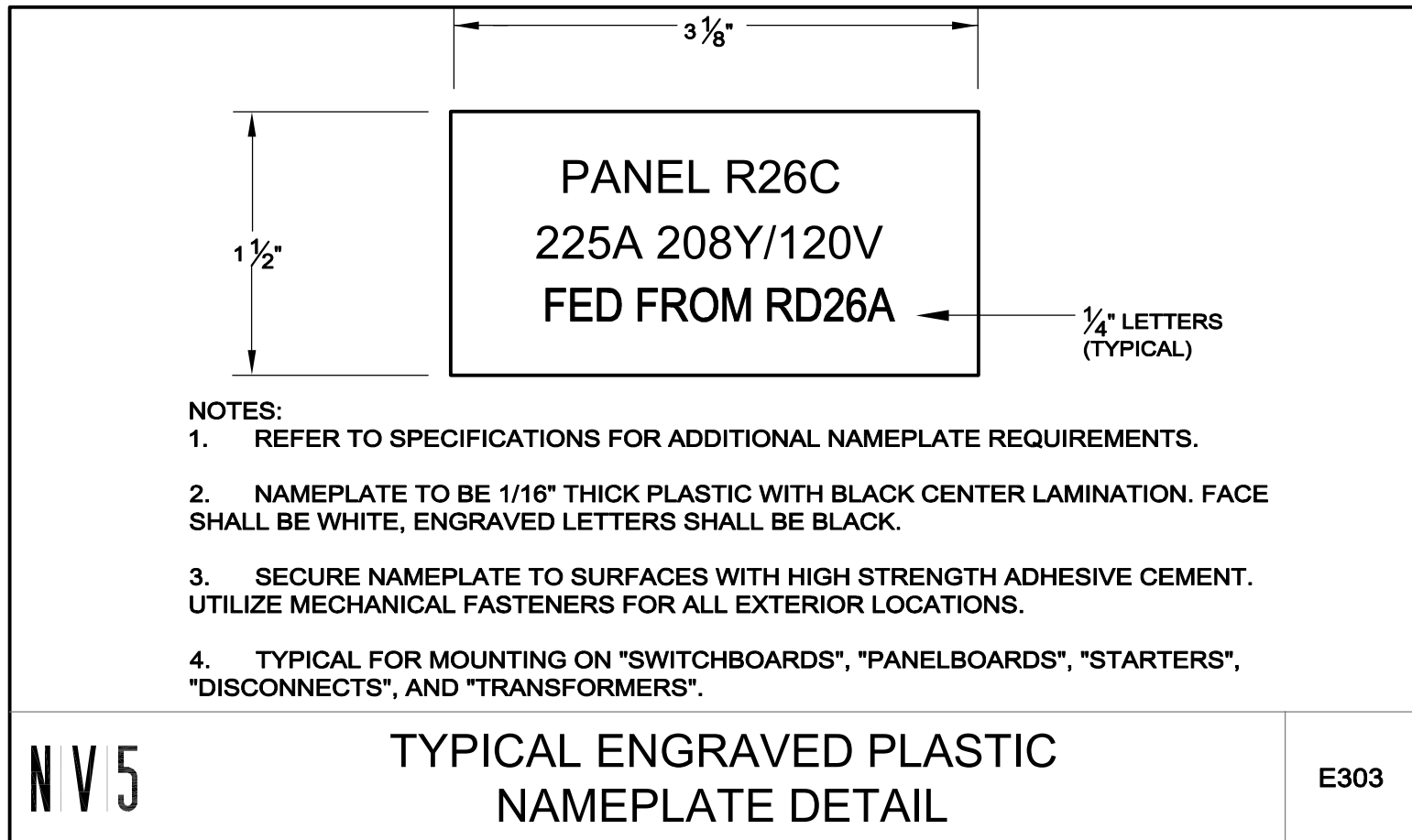
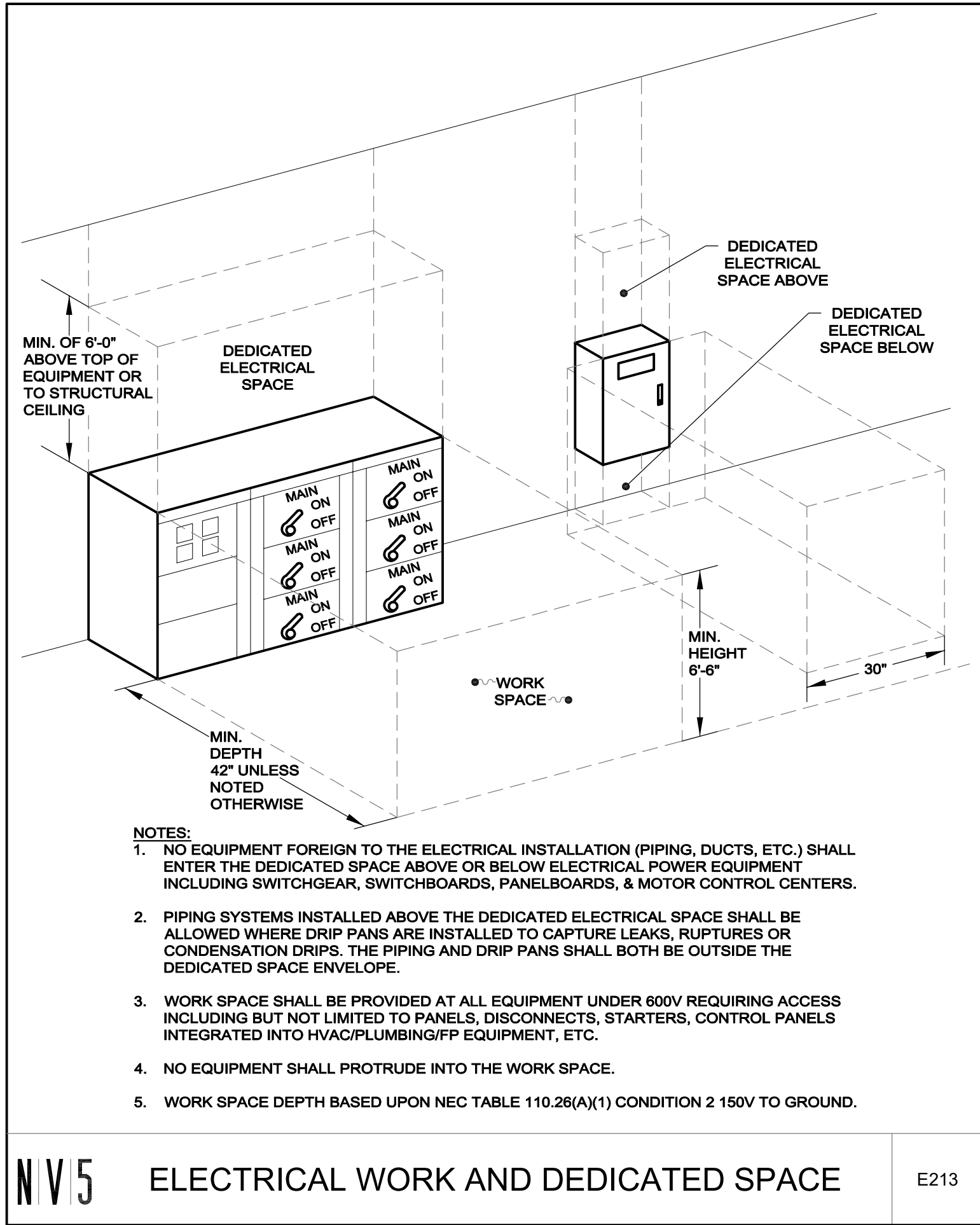
W:\BLD\Pages\2026\017150 - Worcester Hope Cemetery Office\00 Drawings\CAD\09_Elec\05-017150-ES01-ELECTRICAL SCHEDULES - DETAILS.dwg (PAPER) June 24, 2026 - 6:18 PM mads.mcdonald

MECHANICAL EQUIPMENT SCHEDULE																														
LOAD TAG	STARTER LOCATION	LOAD					STARTER										POWER SOURCE		CONNECTION					BRANCH CIRCUIT	REMARKS					
		HP	FLA	KVA	VOLT	PH	NEMA SIZE	TYPE	OVERCURRENT			PB	HOA	INDICATING LIGHTS			AUXILIARY	PANEL	C/B	FLEX	JB	REC	DISC							
									CB	RK1 FUSE	MCP			R	G	A							CPT			CONTACTS		AS	AF	NEMA
																										NO	NC			
ACCU-1	NOTE 8		25	4.9	208	1												P1-3	50A/2P	X					60	40	3R	2#6+10G-3/4"C	NOTES 11, 12	
ACCU-2	NOTE 8		25	4.9	208	1												P1-13	50A/2P	X					60	40	3R	2#6+10G-3/4"C	NOTES 11,12	
ACCU-3	NOTE 8		25	4.9	208	1												P1-20	50A/2P	X					60	40	3R	2#6+10G-3/4"C	NOTES 11,12	
ACCU-4	NOTE 8		25	4.9	208	1												P1-10	50A/2P	X					60	40	3R	2#6+10G-3/4"C	NOTES 11,12	
GF-1	NOTE 8		10	1.25	120	1												P1-17	15A/1P	X					30		1	2#12+12G-3/4"C		
GF-2	NOTE 8		10	1.25	120	1												P1-19	15A/1P	X					30		1	2#12+12G-3/4"C		
GF-2	NOTE 8		10	1.25	120	1												P1-2	15A/1P	X					30		1	2#12+12G-3/4"C		
GF-4	NOTE 8		10	1.25	120	1												P1-16	15A/1P	X					30		1	2#12+12G-3/4"C		
NOTES:																	KEY FVNR FULL VOLTAGE NON-REVERSING FVR FULL VOLTAGE REVERSING 2S1W TWO SPEED SINGLE WINDING 2S2W TWO SPEED TWO WINDING RVAT REDUCED VOLTAGE AUTOTRANSFORMER RVWP REDUCED VOLTAGE PART WINDING RVYDOT REDUCED VOLTAGE WYE DELTA OPEN TRANSITION RVYDCT REDUCED VOLTAGE WYE DELTA CLOSED TRANSITION MMS MANUAL MOTOR STARTER CB CIRCUIT BREAKER MCP MOTOR CIRCUIT PROTECTOR PB START AND STOP PUSH BUTTON HOA HAND-OFF-AUTOMATIC SELECTOR SWITCH CPT CONTROL POWER TRANSFORMER VFD VARIABLE FREQUENCY DRIVE W/O BYPASS VFD/B VARIABLE FREQUENCY DRIVE W/ BYPASS CNTR CONTACTOR - NO THERMAL OVERLOAD													
1. NOTES 2-6 APPLY TO ALL APPLICABLE LOADS. 2. PROVIDE THERMAL OVERLOAD UNITS FOR ALL STARTERS SIZED TO MATCH LOAD NAMEPLATE AND NEC REQUIREMENTS. 3. BRANCH CIRCUIT WIRING METHODS SHALL BE AS NOTED ON THE DRAWINGS AND/OR SPECIFICATIONS FOR THE APPLICABLE LOCATION. THE FINAL THREE FEET (MAXIMUM) SHALL BE FLEXIBLE METAL OR LIQUIDTIGHT FLEXIBLE METAL CONDUIT. 4. COPPER BRANCH CIRCUIT CONDUCTOR SIZING BASED UPON NEC TABLE 310.15(B)(16). MAKE ADJUSTMENTS TO CONDUCTORS FOR TEMPERATURE OR VOLTAGE DROP THAT EXCEED NEC AND SPECIFICATION CRITERIA. 5. RACEWAY SIZES ARE BASED UPON GRSC AND LFMC WITH THWN CONDUCTORS. 6. VFD SHALL BE CONTROLLED VIA REMOTE 4-20mA OR 0-5V SIGNAL PROVIDED BY THE HVAC ATC CONTRACTOR. 7. REQUIRED DISCONNECT IS PROVIDED INTEGRAL/PREWIRED TO MECHANICAL EQUIPMENT. 8. REQUIRED STARTER IS PROVIDED INTEGRAL/PREWIRED TO MECHANICAL EQUIPMENT. 9. DISCONNECT FOR 2S1W AND 2S2W MOTORS SHALL BE SIX POLE. 10. PROVIDE NEUTRAL FROM SOURCE TO STARTER ONLY FOR 120V CONTROL POWER OF 208V 3PH UNITS. 11. FUSES FOR DISCONNECT SWITCHES SHALL BE CLASS RK5. 12. RECONNECT/EXTEND EXISTING BRANCH CIRCUIT WIRING/CONDUIT TO NEW UNIT AS REQUIRED.																														

EXISTING PANELBOARD SCHEDULE												
PANEL: P1		VOLTS: 208Y/120		MOUNT: SURFACE		GROUND BUS: Y						
MAIN: MCB		AMPS: 225		AIC: 10,000		ISOLATED GROUND BUS: N						
		PH/WIRE: 3/4		LOC: -		200% NEUTRAL: N						
CIR.	AMPS/ POLES	DESCRIPTION OF LOAD	LOAD KVA	LOAD BY PHASE, KVA			LOAD KVA	DESCRIPTION OF LOAD	AMPS/ POLES	CIR.		
1	20/1	GAS HWH		1.80	B		1.80	AHU-3	20/1	2		
3	50/2	ACCU-1	4.16			4.16		RANGE	50/2	4		
5			4.16							6		
7	20/1	SPARE (ON)		0.00				DISPOSAL	20/1	8		
9	20/1	DISH WASHER				4.16	4.16	ACCU-4	50/2	10		
11	20/1	KITCHEN REC				4.16	4.16			12		
13	50/2	ACCU-2	4.16	4.16				RANGE HOOD	20/1	14		
15			4.16			5.96		AHU-4	20/1	16		
17	20/1	AHU-1	1.80			1.80	1.80	SPARE (ON)	20/1	18		
19	20/1	AHU-2	1.80	5.96			4.16	ACCU-3	50/2	20		
21	20/2	ELEC HEATER (COMMONS ENTRY)				0.00		WP GFI REC	20/1	22		
23								MOTORIZED DAMPER	20/1	24		
25	20/2	ELEC HEATER (MAIN ENTRY)		0.00				MOTORIZED DAMPER	20/1	26		
27						0.00			20/1	28		
29	20/1	ELEC HEATER REAR ENTRY				0.00		SPARE (ON)	20/1	30		
31	20/1	ELEC HEATER REAR ENTRY		0.00				SPARE (ON)	20/1	32		
33	20/1	PORTE COCHERE				0.00		SPARE (ON)	20/1	34		
35	20/1	OUTSIDE SPOT LIGHTS				0.00		SPACE		36		
37		SPACE		0.00				SPACE		38		
39		SPACE				0.00		SPACE		40		
41		SPACE				0.00		SPACE		42		
CONNECTED KVA BY PHASE -				11.92	18.44	10.12		TOTAL CONNECTED KVA-	40.48			
								DEMAND FACTOR	1.00			
								TOTAL DEMAND KVA-	40.48			
								TOTAL DEMAND AMPERES-	112.36			

EXISTING PANELBOARD SCHEDULE - NEW WORK												
PANEL: P1		VOLTS: 208Y/120		MOUNT: SURFACE		GROUND BUS: Y						
MAIN: MCB		AMPS: 225		AIC: 10,000		ISOLATED GROUND BUS: N						
		PH/WIRE: 3/4		LOC: -		200% NEUTRAL: N						
CIR.	AMPS/ POLES	DESCRIPTION OF LOAD	LOAD KVA	LOAD BY PHASE, KVA			LOAD KVA	DESCRIPTION OF LOAD	AMPS/ POLES	CIR.		
1	20/1	GAS HWH		1.25			1.25	GF-3	15/1	2		
3	50/2	ACCU-1	2.45			2.45		RANGE	50/2	4		
5			2.45							6		
7	20/1	SPARE (ON)		0.00				DISPOSAL	20/1	8		
9	20/1	DISH WASHER				2.45	2.45	ACCU-4	50/2	10		
11	20/1	KITCHEN REC				2.45	2.45			12		
13	50/2	ACCU-2	2.45	2.45				RANGE HOOD	20/1	14		
15			2.45			3.70		GF-4	15/1	16		
17	15/1	GF-1	1.25			1.25		SPARE (ON)	20/1	18		
19	15/1	GF-2	1.25	3.70			2.45	ACCU-3	50/2	20		
21						2.45	2.45			22		
23	20/2	ELEC HEATER (COMMONS ENTRY)				0.00		WP GFI REC	20/1	24		
25								MOTORIZED DAMPER	20/1	26		
27	20/2	ELEC HEATER (MAIN ENTRY)		0.00		0.00		MOTORIZED DAMPER	20/1	28		
29	20/1	ELEC HEATER REAR ENTRY				0.00		SPARE (ON)	20/1	30		
31	20/1	ELEC HEATER REAR ENTRY		0.00				SPARE (ON)	20/1	32		
33	20/1	PORTE COCHERE				0.00		SPARE (ON)	20/1	34		
35	20/1	OUTSIDE SPOT LIGHTS				0.00		SPACE		36		
37		SPACE		0.00				SPACE		38		
39		SPACE				0.00		SPACE		40		
41		SPACE				0.00		SPACE		42		
CONNECTED KVA BY PHASE -				7.40	11.05	6.15		TOTAL CONNECTED KVA-	24.60			
								DEMAND FACTOR	1.00			
								TOTAL DEMAND KVA-	24.60			
								TOTAL DEMAND AMPERES-	68.28			

KEYNOTES	
1	CONNECTED LOAD BASED ON BREAKER RATING AT 80%. EQUIPMENT NAMEPLATE DATA IS NOT AVAILABLE.
2	DISCONNECT/REMOVE EXISTING BREAKER AND PROVIDE NEW BREAKER AS ILLUSTRATED. CIRCUIT BREAKER TYPE AND AIC RATING SHALL MATCH EXISTING BREAKERS. PROVIDE TYPEWRITTEN UPDATED PANEL DIRECTORY AND RE-BALANCE LOADS TO WITHIN 10% PHASE TO PHASE UPON COMPLETION OF WORK.
NOTES: 1 REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.	



NV5

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Andover, MA 01810-4488
T. 978.298.6200
www.NV5.com

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BID SET
06/26/2026

THE PROPRIETOR HEREBY RELEASES THE BIDDERS FROM ALL LIABILITY FOR THE MATERIALS AND WORKMANSHIP OF THE BIDDERS. THE BIDDERS SHALL BE RESPONSIBLE FOR THE MATERIALS AND WORKMANSHIP OF THE BIDDERS. THE BIDDERS SHALL BE RESPONSIBLE FOR THE MATERIALS AND WORKMANSHIP OF THE BIDDERS.

CLIENT

CONSULTANT

PROJECT NAME
CITY OF WORCESTER
HOPE CEMETERY
OFFICE BUILDING
HVAC SYSTEM
UPGRADE

119 WEBSTER ST
WORCESTER, MA 01603

KEY PLAN

REVISION/ISSUANCE
DESCRIPTION DATE

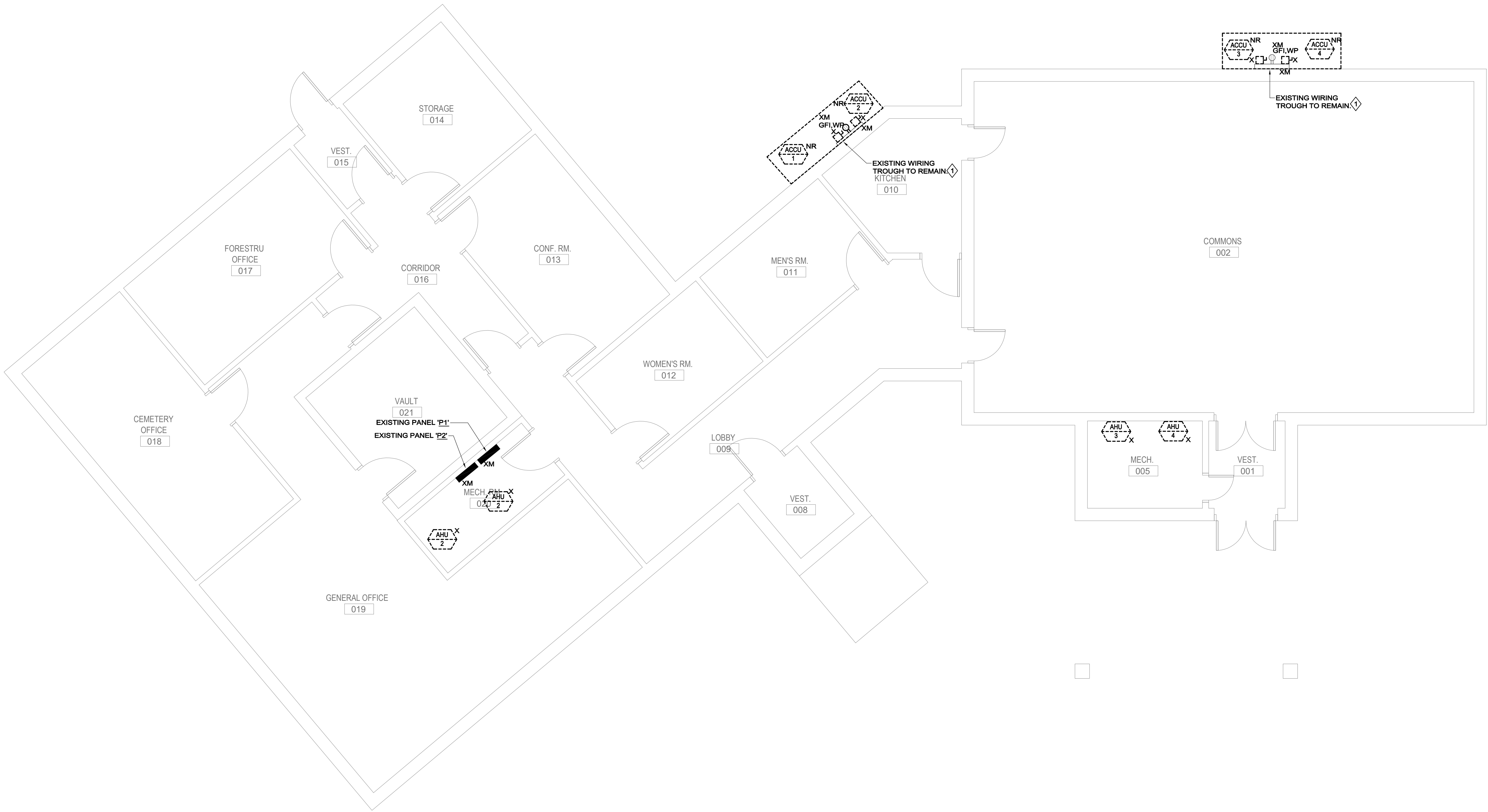
PROJECT NO: PROJECT NUMBER
DESIGNED BY:
CHECKED BY:
DATE: 06/24/2026
SCALE: NTS

SHEET NAME
ELECTRICAL
SCHEDULES

SHEET NUMBER
E601

W:\BLD\Pages\2026\017150 - Worcester Hope Cemetery Office\00 Drawings\CAD\09_Elec\05-017150-ES01-ELECTRICAL SCHEDULES - DETAILS.dwg (PAPER) June 24, 2026 - 6:18 PM mads.mcdonald

W:\BID\Projects\2026\071950 - Worcester Hope Cemetery Office Building Electrical Demolition Plan.dwg [PAPER] June 24, 2026 6:18 PM mma:rdm\ed



1 ELECTRICAL DEMOLITION PLAN
ED100 1/4"=1'-0"

1/4" = 1'-0" 4'-0" 8'-0"

- NOTES:**
1. REFER TO DRAWING E001 FOR LEGEND, SYMBOLS AND DEMOLITION NOTES.
 2. REFER TO MECHANICAL DRAWINGS FOR ASSOCIATED NOTES, DETAILS AND EXACT LOCATION OF ALL EQUIPMENT.
 3. MAINTAIN CONTINUITY OF BRANCH CIRCUITRY ASSOCIATED WITH ALL EXISTING POWER DEVICES TO REMAIN.

KEYNOTES	
1	EXISTING UNIT AND RELATED DISCONNECT SWITCH SHALL BE DISCONNECTED/REMOVED. RELATED WIRING TROUGH AND BRANCH CIRCUIT WIRING/CONDUIT HOME RUN SHALL BE DISCONNECTED, 'MADE SAFE' AND RETAINED FOR REUSE.
NOTES:	
1 REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.	

**100%
BID SET**
06/26/2026

THE REPRESENTING ENGINEER HAS REVIEWED THIS BIDDING SET ONLY TO THE MATERIALS AND METHODS SHOWN ON THIS SET. ALL DIMENSIONS, SPECIFICATIONS, AND CONDITIONS FOR THE WORK SHALL BE AS SHOWN ON THE DRAWINGS. THE ENGINEER HAS NOT CONDUCTED A VISUAL INSPECTION OF THE PROJECT SITE OR THE EXISTING CONDITIONS. THE ENGINEER HAS NOT CONDUCTED A VISUAL INSPECTION OF THE PROJECT SITE OR THE EXISTING CONDITIONS.

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REVISION/ISSUANCE		
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PROJECT NO: _____ PROJECT NUMBER
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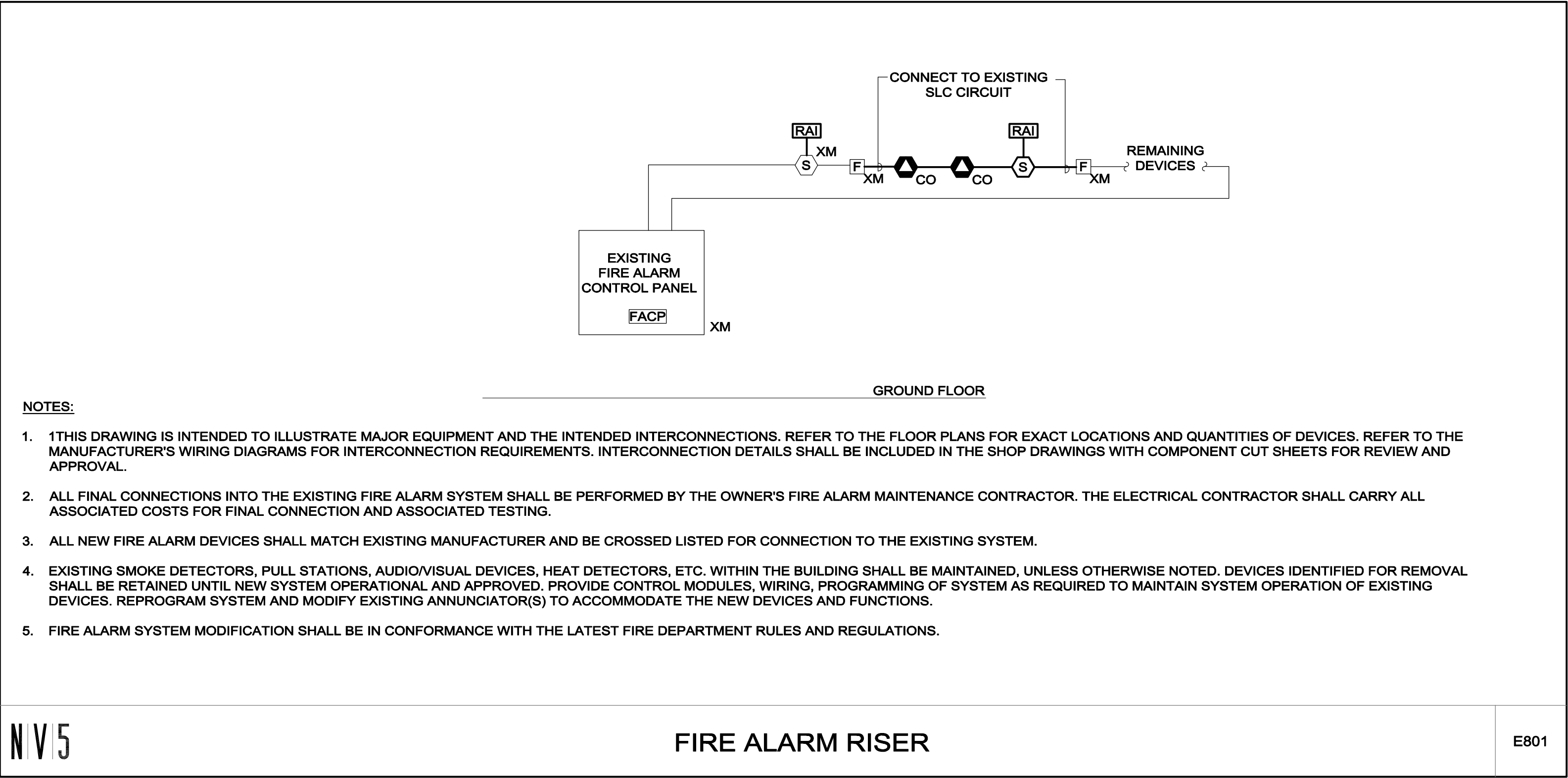
SHEET NAME

ELECTRICAL
DEMOLITION PLAN

SHEET NUMBER

ED100

W:\BLD\Projects\2025-071940 - Worcester Hope Cemetery Office\00 Drawings\CAD\B - ELEC\017940 FA100 FIRE ALARM NEW WORK PLAN.dwg [PAPER] June 24, 2025 - 5:15 PM mduffy.mcdmell



FIRE ALARM NOTES:

1. FIRE ALARM BRANCH CIRCUITRY SHALL BE INSTALLED IN CONDUIT FROM THE PANEL TO THE FIRST DEVICE AND/OR WHERE EXPOSED. FIRE ALARM BRANCH CIRCUITRY MAY BE TYPE MC CABLE WHERE CONCEALED ABOVE SUSPENDED CEILINGS AND IN METAL STUD WALLS.
2. MC CABLE FOR FIRE ALARM SERVICE SHALL HAVE A RED IDENTIFIER ALONG ITS ENTIRE LENGTH. JUNCTION BOX COVERS AND CONDUIT COUPLINGS FOR ALL FIRE ALARM WIRING RACEWAYS SHALL BE PAINTED RED PRIOR TO INSTALLATION.
3. MAINTAIN CONTINUITY OF BRANCH CIRCUITRY ASSOCIATED WITH ALL EXISTING FIRE ALARM DEVICES TO REMAIN.

FIRE ALARM LEGEND

FACP	FIRE ALARM CONTROL PANEL
S	FIRE ALARM SMOKE DETECTOR, PHOTO ELECTRIC UNLESS NOTED OTHERWISE
CO	GAS DETECTOR "XX" INDICATES GAS TYPE CO = CARBON MONOXIDE SENSOR
F	FIRE ALARM MANUAL PULL STATION
RAI	REMOTE ALARM INDICATOR

FIRE ALARM PERMIT SUBMISSION NOTES

1. REFERENCE TO NFPA 72 ARE TO THE 2019 EDITION IN ACCORDANCE WITH 780 CMR.
2. THIS DRAWING CONSTITUTES THE TIER ONE FLOOR PLAN SUBMISSION IN ACCORDANCE WITH THE MA STATE BUILDING CODE 780CMR 901.2.2.1 THESE REQUIREMENTS INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
 - a. FLOOR PLAN ILLUSTRATING ALL ROOM USES.
 - b. LOCATION OF ALL INITIATING DEVICES.
 - c. LOCATION OF ALL FIRE ALARM CONTROL PANELS AND ANNUNCIATORS.
3. THE INSTALLING CONTRACTOR IS RESPONSIBLE FOR THE DEVELOPMENT AND SUBMISSION OF THE REQUIRED TIER TWO SHOP DRAWINGS IN ACCORDANCE WITH 780CMR 901.2.2 AND 907.1.2. TIER TWO SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND BE OF SUFFICIENT QUALITY TO BE APPROVED PRIOR TO THE CONTRACTORS SUBMISSION TO THE AHJ FOR PERMIT.
 - a. NAME, LICENSE NUMBER AND LICENSE EXPIRATION DATE OF THE INSTALLING CONTRACTOR.
 - b. RISER DIAGRAM WITH ALL DEVICES, INTERCONNECTING WIRING AND CIRCUITING INTENT.
 - c. MANUFACTURER'S CUT SHEETS FOR ALL DEVICES AND MATERIALS.
 - d. THE ACTUAL BUILDING FA SEQUENCE OF OPERATIONS OBTAINED FROM THE OWNER'S FA MAINTENANCE CONTRACTOR
 - e. FLOOR PLANS DERIVED FROM THE TIER ONE SUBMISSION PLANS WITH THE FOLLOWING INFORMATION MODIFIED/ADDED:
 - i. ACAD PLANS WILL BE MADE AVAILABLE FOR THE CONTRACTORS USE INCLUDING ALL TIER ONE INFORMATION IN ACCORDANCE WITH THE CONTRACTUAL REQUIREMENTS. THE DOCUMENT SHALL CLEARLY INDICATE THE CONTRACTOR'S OWNERSHIP OF ILLUSTRATED INFORMATION.
 - ii. CONDUIT ROUTING AND CONDUCTOR TYPE AND COUNT BETWEEN ALL DEVICES ILLUSTRATING INSTALLATION INTENT, WHERE REQUIRED BY THE RISER AND/OR SPECIFICATIONS, CLEARLY ILLUSTRATE CLASS A SEPARATIONS.
 - iii. AUDIBLE DEVICE TAP SETTINGS WHERE ADJUSTABLE.
 - iv. INITIATING DEVICE ADDRESSES WHERE MANUFACTURER CAN APPLY THEM PRIOR TO INSTALLATION ON THE SLC.
5. NFPA 72 AND 780 CMR 901.2.2.3. TIER THREE RECORD DRAWINGS INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
 - a. AS-BUILT PLANS DERIVED FROM THE TIER TWO FLOOR PLANS ILLUSTRATING INSTALLED CONDITIONS AND DEVICE ADDRESSES.
 - b. WRITTEN VERSION OF SEQUENCE OF OPERATION SHALL BE INCLUDED.
 - c. O&M MANUAL PER NFPA 72 REQUIREMENTS.
 - d. SYSTEM RECORD OF COMPLETION FORM PER NFPA 72 FIGURES 7.8.2(a) THRU (f) SECTIONS AS APPLICABLE TO THE PROJECT SCOPE.
 - e. SYSTEM RECORD OF INSPECTION AND TESTING FORM PER NFPA 72 FIGURE 7.8.2(g) THRU (i) SECTIONS AS APPLICABLE TO THE PROJECT SCOPE.
 - f. CONFIRMATION THAT A RECORD COPY OF THE SITE SPECIFIC SOFTWARE HAS BEEN DELIVERED TO THE OWNER'S REPRESENTATIVE.

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BID SET**
06/26/2026

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SHEET NAME

**FIRE ALARM
NEW WORK PLAN**

SHEET NUMBER

FA100