EMERGENCY GENERATOR REPLACEMENT
18-20 AND 76 EAST WORCESTER STREET

DEPARTMENT OF PUBLIC WORKS
WORCESTER, MASSACHUSETTS
BID DOCUMENTS
NOVEMBER 4, 2025
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LOCUS MAP
SCALE 1:1000

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RACEWAY SUPPORT LEGEND

TELE/DATA TAGS

DEVICE INDICATOR LETTER "X" COMMUNICATES CONNECTION TYPE

OPTIONAL TYPE DESIGNATOR
"BLANK" - TELE/DATA DEVICE WITH NO OPTION
"C" - MOUNTED 8" ABOVE WORK SURFACE OR COUNTERTOP
"H" - MOUNTED HIGH ON WALL

WALL	CLG	FLR	TELE/DATA SYMBOL DESCRIPTION
			DATA ONLY OUTLET DEVICE
			VOICE / DATA COMBINATION OUTLET DEVICE
			VOICE ONLY OUTLET DEVICE

TELE/DATA NOTES

1. ALL WALL MOUNTED DEVICES ARE TO BE MOUNTED 18" AFF UNLESS OTHERWISE NOTED.
2. COORDINATE MOUNTING HEIGHTS WITH THE ARCHITECT PRIOR TO INSTALLATION.
3. BACK BOX AND TO BE PROVIDED WITH 1"C (WITH PULL STRING) RUN CONCEALED WITHIN WALL TO ABOVE FINISHED CEILING AND TERMINATING WITHIN 6" OF CABLE TRAY. WIRING AND DEVICES BY OTHERS.

DEVICE SYMBOLS	DEVICE SYMBOL DESCRIPTION
	3/4" THICK x 8'-0" HIGH x LENGTH AS INDICATED ON THE DRAWINGS PLYWOOD. PLYWOOD SHALL BE PAINTED GRAY AND MOUNTED TO WALL.
AV	2-GANG BACKBOX WITH SINGLE GANG PLASTER RING AND COVERPLATE

COMMUNICATION DEVICE NOTES

1. COORDINATE EXACT LOCATION OF SECURITY CAMERAS AND CCTV'S WITH OWNER AND SECURITY VENDOR PRIOR TO INSTALLATION.

WIRING LEGEND

- J-HOOK CABLE MANAGEMENT TYPICALLY MOUNTED 6" ABOVE FINISHED CEILING
- CABLE TRAY (WITH FITTING)
- FITTING CONDUIT TURNING UP
- CONDUIT TURNING DOWN
- CONDUIT STUBBED 6" ABOVE ACCESSIBLE CEILING AT 90° ANGLE WITH BUSHED END
- FLEXIBLE RACEWAY
- PP123 / 5 HOMERUN TO PANELBOARD "PP123"; BRANCH CIRCUIT No. 5; 2#12 & 1#12G., 3/4"C. UNLESS OTHERWISE NOTED.

WIRING METHODS

REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION

NOTE: SIZE AND INSTALL BRANCH CIRCUIT CONDUCTORS FOR A MAXIMUM BRANCH CIRCUIT VOLTAGE DROP OF 3% FROM PANELBOARDS. TOTAL VOLTAGE DROP FROM SERVICE ENTRY TO LAST DEVICE ON THE CIRCUIT TO NOT EXCEED 5%. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND OPTIONS.

NORMAL SYSTEM FEEDERS	THHN/THWN/XHHW CONDUCTORS IN EMT
EMERGENCY SYSTEM FEEDERS	MI CABLE
EQUIPMENT SYSTEM FEEDERS	THHN/THWN/XHHW CONDUCTORS IN EMT
NORMAL BRANCH CIRCUITS	THHN/THWN/XHHW CONDUCTORS IN EMT OR HOSPITAL GRADE AC CABLE
EMERGENCY SYSTEM (LIFE SAFETY AND CRITICAL) BRANCH CIRCUITS	THHN/THWN/XHHW CONDUCTORS IN EMT
NURSE CALL SYSTEM WIRING	CONDUCTORS IN EMT
TELEDATA WIRING	CAT6 WIRING IN EMT (REFER TO COMMUNICATIONS LEGEND FOR ADDITIONAL INFORMATION)

POWER LEGEND

PANEL TAGS

"BUILDING NUMBER"
- "CR" - CRITICAL
- "LS" - LIFE SAFETY
- "EQ" - EQUIPMENT BRANCH
- "E" - EMERGENCY
- "LX" - LEGAL STANDBY
- "OX" - OPTIONAL STANDBY
- "S" - SWITCHBOARD
- "D" - DISTRIBUTION PANEL
- "L" - LIGHTING
- "M" - MECHANICAL
- "K" - KITCHEN PANEL
- "P" - POWER
- FLOOR
- SEQUENTIAL PANEL NUMBER PER FLOOR

#-XXX##

NOTE: PANEL NAMES MAY NOT USE ALL TAG LANGUAGE.

PANEL MOUNTING SYMBOL DESCRIPTION

- FLUSH MOUNTED PANELBOARD
- SURFACE MOUNTED PANELBOARD

PANEL HATCH SYMBOL DESCRIPTION

- 240/ 208/ 120V PANELBOARD
- 600/ 480/ 277V PANELBOARD
- 240/ 208/ 120V DISTRIBUTION BOARD
- 600/ 480/ 277V DISTRIBUTION BOARD

POWER SYMBOLS	POWER SYMBOL DESCRIPTION
	DISCONNECT SWITCH - NEMA 1 ENCLOSURE - UNFUSED DISCONNECT SWITCH - NEMA 1 ENCLOSURE - FUSED
	30A/3P UNLESS OTHERWISE NOTED
60AS 3P / 40AF	60AS - DENOTES SWITCH AMPERAGE RATING 40AF - DENOTES FUSE AMPERAGE RATING 3P - DENOTES 3-POLE
$M	MANUAL MOTOR STARTER - INTEGRAL THERMAL PROTECTION
VFD	VARIABLE FREQUENCY DRIVE
T#	DRY TYPE TRANSFORMER # - SIZE, REFER TO TRANSFORMER SCHEDULE
GTA	GENERATOR ANNUNCIATOR PANEL
ATSA	ATS ANNUNCIATOR PANEL

SITE LEGEND

- HH - HANDHOLE
- EM - ELECTRIC MANHOLE
- TM - TELEPHONE / DATA MANHOLE
- EH - ELECTRIC HANDHOLE
- TH - TELEPHONE / DATA HANDHOLE
- M - UTILITY SERVICE METER
- UP-1 - UTILITY POLE
- LC - LIGHTING CONTACTOR
- TC - TIME CLOCK

EMERGENCY CALL SYSTEM LEGEND

- ET - EMERGENCY CALL
  - "T"- DENOTES TOILET/ DRESSING ROOM STATION LOCATION, WALL MOUNTED DEVICE WITH PULLCORD.
  - "S"- DENOTES SHOWER STATION LOCATION, WALL MOUNTED DEVICE WITH PULLCORD.
  - "MS"- DENOTES EMERGENCY CALL SYSTEM MASTER STATION
  - "A"- DENOTES EMERGENCY CALL SYSTEM ANNUNCIATOR STATION
- DOME LIGHT LOCATION - CEILING OR WALL AS DIRECTED BY ARCHITECT OR HOSPITAL PERSONNEL.

STAMPED

DEVICE LEGEND

RECEPTACLE TAGS

OPTIONAL TYPE DESIGNATOR
"BLANK" - RECEPTACLE WITH NO OPTION
"GFI" - GROUND FAULT INTERRUPTER
"C" - MOUNTED 8" ABOVE WORK SURFACE OR COUNTERTOP
"REF" - MOUNTED AT 48" FOR FULL HEIGHT REFRIGERATOR
"UC" - MOUNTED UNDER CABINET
"WP" - WEATHERPROOF TYPE: NEMA 3R MINIMUM
"WR" - WEATHER RESISTANT DEVICE AND IN-USE COVER
"TR" - TAMPER RESISTANT
"USB" - COMBINATION USB DEVICE
"CP" - RECEPTACLE MOUNTED IN CEILING FOR PROJECTOR
"PT" - 2 HOUR FIRE RATED POKE-THROUGH
"TV" - MOUNTED HIGH ON WALL BEHIND TELEVISION.
"H" - MOUNTED HIGH ON WALL
"HS" - HALF SWITCHED
"USB" - COMBINATION USB/DUPLEX RECEPTACLE

PANELBOARD BRANCH CIRCUIT NUMBER

REC SYMBOLS WALL	CLG	FLR	RECEPTACLE SYMBOL DESCRIPTION
			DUPLEX RECEPTACLE
			DOUBLE DUPLEX RECEPTACLE
			SINGLE RECEPTACLE
			DUPLEX RECEPTACLE, ON GENERATOR
			DOUBLE DUPLEX RECEPTACLE, ON GENERATOR
			SINGLE RECEPTACLE, ON GENERATOR
			HOSPITAL GRADE, DUPLEX RECEPTACLE
			HOSPITAL GRADE, DOUBLE DUPLEX RECEPTACLE
			HOSPITAL GRADE, DUPLEX RECEPTACLE, ON GENERATOR
			HOSPITAL GRADE, DOUBLE DUPLEX RECEPTACLE, ON GENERATOR
S1	S1	S1	SPECIAL PURPOSE RECEPTACLE NEMA TYPE AS INDICATED ON THE PLANS

RECEPTACLE NOTES

1. ALL RECEPTACLES ARE MOUNTED 18" AFF UNLESS OTHERWISE NOTED.
2. COORDINATE MOUNTING HEIGHTS WITH THE ARCHITECT PRIOR TO INSTALLATION.
3. ALL RECEPTACLES SHALL BE NEMA 5-20R UNLESS OTHERWISE NOTED.
4. PROVIDE ALL RECEPTACLES WITHIN 6'-0" OF A SINK WITH GFCI PROTECTION.
5. ALL RECEPTACLES WITHIN PATIENT ACCESSIBLE AREAS SHALL BE TAMPERPROOF TYPE DEVICES.
6. PROVIDE TAMPERPROOF RECEPTACLES IN ALL CHILD CARE FACILITIES, PRESCHOOLS AND EDUCATION FACILITIES, DORMITORY UNITS, AND WITHIN BUSINESS OFFICES / CORRIDORS / WAITING ROOMS ETC. WITHIN CLINICS / MEDICAL OFFICES / OUTPATIENT FACILITIES.

JUNCTION BOX TAGS

DEVICE INDICATOR LETTER "X" COMMUNICATES CONNECTION TYPE

OPTIONAL TYPE DESIGNATOR
"BLANK" - JUNCTION BOX WITH NO OPTION
"ADO" - AUTOMATIC DOOR OPERATOR
"ATC" - AUTOMATIC TEMPERATURE CONTROLS
"B" - JUNCTION BOX WITH BLANK COVER
"CCTV" - CLOSED CIRCUIT SECURITY CAMERA
"ELF" - ELECTRONIC FAUCET OR FLUSH VALVE
"EM" - EMERGENCY POWER CIRCUIT AS INDICATED
"EWC" - ELECTRIC WATER COOLER
"NM" - NORMAL POWER CIRCUIT AS INDICATED
"PS" - MOTORIZED PROJECTION SCREEN
"SEC" - SECURITY DEVICES
"T/D" - TEL/DATA WIRING
"USB" - COMBINATION USB DEVICE
"BAT" - BATTERY CHARGER

WALL	CLG	FLR	JUNCTION BOX SYMBOL DESCRIPTION
			JUNCTION BOX

DEVICE SYMBOLS	DEVICE SYMBOL DESCRIPTION
	TRIPLE CHANNEL, SURFACE MOUNTED, ALUMINUM RACEWAY, DUAL COVER WIREMOLD #AL7450 SERIES OR APPROVED EQUAL. RACEWAY TO BE MOUNTED 6" ABOVE WORK SURFACE OR AS DIRECTED BY OWNER/ARCHITECT. PRE-WIRED, WITH DUPLEX NEMA 5-20R RECEPTACLES FOR NORMAL POWER, (RED RECEPTACLES FOR EMERGENCY), AND VOICE/DATA PROVISION LOCATIONS. NORMAL POWER DEVICES 24" ON CENTER, EMERGENCY POWER DEVICES 48" ON CENTER, AND TELE/DATA LOCATIONS 48" ON CENTER, UNLESS OTHERWISE NOTED.
ECB	ENCLOSED CIRCUIT BREAKER - NEMA 1 ENCLOSURE
PB	PULL BOX
ADO	PUSHBUTTON - REFER TO ARCHITECT'S DOOR HARDWARE SCHEDULE FOR EXACT REQUIREMENTS "ADO" - AUTOMATIC DOOR OPENER "EPO" - EMERGENCY PUSH OFF

GROUNDING LEGEND

- GROUNDING COUNTERPOISE - (3) COPPER GROUND RODS AT 10'-0" ON CENTER
- GND - GROUNDING CONDUCTOR: 1/0 CU GND MINIMUM - UNLESS NOTED OTHERWISE
- GROUND ROD
- GROUND BAR - 2"H x 1/4" THICK x 18"L, MOUNTED 24" AFF WITH 2" SPACE BETWEEN GROUND BUS AND WALL
- GROUNDING ELECTRODE CONDUCTOR OF SEPARATELY DERIVED SYSTEM.

MECHANICAL EQUIPMENT COORDINATION

ELECTRICAL CONTRACTOR SHALL REFER TO THE MECHANICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS AND SPECIFICATIONS FOR LOCATIONS AND QUANTITIES OF EQUIPMENT RELEASED TO EACH TRADE.

- $M VFD - PROVIDED BY ELECTRICAL CONTRACTOR
- $M VFD - PROVIDED BY MECHANICAL CONTRACTOR

LIGHTING LEGEND

LIGHTING TAGS

- "LP" - LIGHTING PENDENT
- "LD" - LIGHTING DOWNLIGHT
- "LS" - LIGHTING SURFACE MOUNTED
- "LR" - LIGHTING RECESSED
- "SL" - SITE LIGHTING
- "NL" - NIGHT LIGHT
- 1,2,3 ETC. - NUMERAL TYPE DESIGNATOR

OPTIONAL TYPE DESIGNATOR
"BLANK" - NORMAL POWER
"E" - PROVIDED WITH EMERGENCY BATTERY

XX##X - PANELBOARD BRANCH CIRCUIT NUMBER
a - LOWERCASE LETTER DENOTES LOCAL SWITCH

REFER TO LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION PERTAINING TO EACH FIXTURE TYPE LISTED ON PLAN DRAWINGS

LIGHTING SYMBOLS	LIGHTING SYMBOL DESCRIPTION
LR1	SURFACE OR RECESSED MOUNTED LIGHTING FIXTURE
LR1	RECESSED LINEAR WALL WASH
LS1	STRIP LIGHTING FIXTURE
LS1	COMMERCIAL STRIP LIGHTING FIXTURE
LS1	WALL MOUNTED LIGHTING FIXTURE
LS1	TRACK MOUNTED LIGHTING FIXTURE
	REMOTE EMERGENCY LIGHTING, SINGLE HEAD MOUNT 7'-6" AFF
	REMOTE EMERGENCY LIGHTING, DUAL HEAD MOUNT 7'-6" AFF
	EMERGENCY BATTERY UNIT, MOUNT 7'-6" AFF; NO. OF EMERGENCY LIGHTING HEADS AS INDICATED.
SL1	SITE LIGHTING FIXTURE
SL2	STRIP LIGHTING BOLLARD

WALL	CLG	
1 a	LD1 1 a	CIRCULAR LIGHT FIXTURE
		EXIT SIGN - SHADED AREA INDICATES LOCATION AND QUANTITY OF FACES; DIRECTIONAL ARROWS AS INDICATED

LIGHT FIXTURE CONNECTED TO:

NORMAL BRANCH CIRCUITRY	EMERGENCY BRANCH CIRCUITRY
CRITICAL BRANCH CIRCUITRY	LIFE SAFETY BRANCH CIRCUITRY
LEGALLY REQUIRED STANDBY	OPTIONAL STANDBY BRANCH CIRCUITRY

SWITCHES LEGEND

DEVICE INDICATOR LETTER "X" EQUALS DESIGNATION BELOW WALL MOUNTED SWITCHES TO BE AT 48" AFF UNO

- "EMPTY" - SINGLE POLE SWITCH
- "2" - TWO POLE, SINGLE THROW SWITCH
- "3" - 3-WAY, SINGLE POLE, DOUBLE THROW
- "4" - 4-WAY, DOUBLE POLE, DOUBLE THROW
- "D" - DIMMER SWITCH, SINGLE POLE
- "LV" - LOW VOLTAGE
- "MS" - MASTER STATION OVERRIDE
- "WP" - WEATHERPROOF
- "OS" - OCCUPANCY SENSOR - WALL MOUNTED, INTEGRAL DUAL TECHNOLOGY, SINGLE POLE SWITCH
- "a" - SMALL CASE LETTER DENOTES LIGHT FIXTURE CONTROL

- OS - OCCUPANCY SENSOR - WALL MOUNTED, INTEGRAL DUAL TECHNOLOGY, DUAL RELAY SWITCH.
- OS - OCCUPANCY SENSOR - CEILING MOUNTED, INTEGRAL DUAL TECHNOLOGY, DUAL RELAY SWITCH.
- VS - VACANCY SENSOR - WALL MOUNTED, INTEGRAL DUAL TECHNOLOGY.
- VS - VACANCY SENSOR - CEILING MOUNTED, INTEGRAL DUAL TECHNOLOGY.
- PC - PHOTOCELL - CEILING MOUNTED
- PC - PHOTOCELL - WALL MOUNTED

FOR CEILING MOUNTED OCCUPANCY SENSORS:
PROVIDE THE APPROPRIATE QUANTITY OF POWER SUPPLIES FOR SINGLE AND MULTIPLE LEVEL SWITCHING. REFER TO FLOOR PLANS FOR SWITCHING LAYOUTS TO DETERMINE EXACT QUANTITY OF POWER SUPPLIES

MASTER CLOCK SYSTEM LEGEND

- CK A CK - CLOCK - CEILING MOUNTED, WALL MOUNTED RESPECTIVELY
  - "A" - DENOTES ANALOG SYNCHRONOUS CLOCK
  - "D" - DENOTES DIGITAL CLOCK
  - "E" - DENOTES DIGITAL CLOCK/ ELAPSED TIMER COMBINATION
- ET - ELAPSED TIMER CONTROL UNIT
- MCCU - MASTER CLOCK SYSTEM CONTROL UNIT

ONE LINE DIAGRAM LEGEND

- CR43A1 - PANELBOARD "CR43A1"
- TRANSFER SWITCH
  - "ATS" = AUTOMATIC TRANSFER SWITCH
  - "MTS" = MANUAL TRANSFER SWITCH
  - "BP" = BYPASS ISOLATION SWITCH
  - "LS" = LIFE SAFETY BRANCH
  - "CR" = CRITICAL BRANCH
  - "EQ" = EQUIPMENT BRANCH
  - "ELEV" = ELEVATOR BRANCH
  - "X-RAY" = X-RAY EQUIPMENT BRANCH
  - "EM" = EMERGENCY
  - "LR" = LEGALLY REQUIRED
  - "OS" = OPTIONAL STANDBY
  - "3P" = NUMBER OF POLES; 3 POLE
  - "4P" = NUMBER OF POLES; 4 POLE
- GROUND CONNECTION
- SPD - SURGE PROTECTIVE DEVICE
- 100AF 60AT 3P - CIRCUIT BREAKER DRAW OUT
  - 100AF - DENOTES CIRCUIT BREAKER FRAME
  - 60AT - DENOTES CIRCUIT BREAKER TRIP
- 100AF 60AT 3P - CIRCUIT BREAKER FIXED
  - 100AF - DENOTES CIRCUIT BREAKER FRAME
  - 60AT - DENOTES CIRCUIT BREAKER TRIP
- TRANSFORMER
  - BOX REPRESENTS PAD MOUNTED
- CT - CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- DISCONNECT SWITCH FUSED / LOW VOLTAGE FUSIBLE SWITCH
- DISCONNECT SWITCH UNFUSED
- MEDIUM VOLTAGE FUSIBLE SWITCH
- FUSE
- K - KIRK KEY INTERLOCK
- V - VOLTMETER
- ST - SHUNT TRIP DEVICE

RECEPTACLE NOTES

1. REFER TO DEMOLITION / RELOCATION LEGEND FOR LINETYPE AND LINEWEIGHT TO DETERMINE EXISTING CONDITIONS AND DEMOLISHED EQUIPMENT.

DRAWING LIST

SHEET NUMBER	SHEET NAME
E000	ELECTRICAL LEGEND
E001	ELECTRICAL LEGEND, NOTES, AND ABBREVIATIONS
E110	ELECTRICAL SITE POWER DEMOLITION PLAN
E111	ELECTRICAL SITE POWER PLAN
E700	EXISTING ELECTRICAL RISER DIAGRAM
E900	ELECTRICAL SCHEDULES AND DETAILS

THIS IS A STANDARD SYMBOL LIST. ALL DEVICE SYMBOLS AND ABBREVIATIONS MAY NOT NECESSARILY APPEAR ON THE DESIGN PLANS OR DETAIL SHEETS. ONLY THOSE SYMBOLS INDICATED ON THE DESIGN PLANS ARE USED AND OTHERS SHOULD BE DISREGARDED.

100%CD

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Key Plan:

Owner:
CITY OF WORCESTER

Project Name:

Worcester-MA 18-20 E Worcester St - Gen

Worcester, MA

North Arrow

Stamp:
COMMONWEALTH OF MASSACHUSETTS
MICHAEL Y. PANG
ELECTRICAL
NO. 48483
REGISTERED PROFESSIONAL ENGINEER
03/28/2025

Rev.	Description	Date

Scale Bar:

Drawing Title:
ELECTRICAL LEGEND

Date	03/28/2025
Scale	NTS
Drawn By	HK
Checked By	MP
Project Number	210538.13

Drawing No.
E000

DEMOLITION GENERAL NOTES

1. REFER TO THE ARCHITECTURAL DRAWINGS FOR THE FULL EXTENT OF THE SCOPE OF DEMOLITION. DISCONNECT AND MAKE SAFE ALL ELECTRICAL EQUIPMENT IDENTIFIED FOR REMOVAL ON THE ARCHITECTURAL, HVAC, PLUMBING AND FIRE PROTECTION PLANS. THE ELECTRICAL SCOPE MAY EXTEND BEYOND THE AREA DEFINED BY THE ARCHITECTURAL DEMOLITION LIMITS TO FULLY COMPLY WITH THE VARIOUS REQUIREMENTS DEFINED BY THESE NOTES.
2. THE ELECTRICAL DEMOLITION PLANS INDICATE THE GENERAL INTENT AND ARE NOT INTENDED TO SHOW ALL COMPONENTS AND ITEMS TO BE REMOVED OR RETAINED. THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMISSION OF THEIR BID TO BECOME FAMILIAR WITH THE ACTUAL WORKING CONDITIONS AND EXTENT OF WORK. DISCONNECT AND MAKE SAFE DEVICES AND EQUIPMENT LOCATED ON WALLS AND/OR CEILINGS DESIGNATED TO BE REMOVED. THE ELECTRICAL CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE OF ANY UNANTICIPATED OR HIDDEN CONDITIONS ENCOUNTERED DURING DEMOLITION.
3. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ALL SYSTEMS OR BUILDING COMPONENTS DAMAGED DURING THE EXECUTION OF THE WORK. DAMAGE SHALL INCLUDE, BUT NOT BE LIMITED TO, THE DESTRUCTION OR DISPOSAL OF ITEMS INTENDED TO REMAIN OR BE SALVAGED.
4. TRACE AND LABEL ALL EXISTING BRANCH CIRCUITS AND FEEDERS WITHIN OR ASSOCIATED WITH THE AREA OF DEMOLITION SCOPE PRIOR TO DE-ENERGIZING AND DISCONNECTION. TRACE AND LABEL ALL CIRCUITS WITHIN PANELBOARDS IDENTIFIED FOR REMOVAL TO ENSURE THAT NO AREA OUTSIDE THE DEMOLITION SCOPE LIMIT IS AFFECTED.
5. IDENTIFY ALL BRANCH CIRCUITS, FEEDERS AND SYSTEM COMPONENTS WHICH ARE TO REMAIN WITHIN THE AREA OF DEMOLITION SCOPE. THERE SHALL BE NO INTERRUPTION OF SERVICE TO ANY AREA OUTSIDE THE SCOPE LIMITS WITHOUT APPROVAL FROM THE OWNER'S REPRESENTATIVE. LEAVE EXISTING EQUIPMENT TO REMAIN IN A CODE COMPLIANT CONDITION.
6. DE-ENERGIZE AND REMOVE ALL CONDUCTORS AND RACEWAYS TO THEIR POINTS OF ORIGIN WITHIN THE AREA OF DEMOLITION SCOPE. DO NOT ABANDON IN PLACE ITEMS IDENTIFIED FOR DEMOLITION RACEWAYS THAT ENTER MASONRY WALLS AND FLOORS SHALL BE CUT FLUSH AT THE SURFACE FOR PATCHING BY OTHERS. DE-ENERGIZE AND LABEL ALL CIRCUIT BREAKERS ASSOCIATED WITH THE DEMOLITION AS SPARE.
7. TEMPORARILY SUPPORT ALL ITEMS TO REMAIN THAT ARE AFFECTED BY THE DEMOLITION OF BUILDING STRUCTURAL COMPONENTS (WALLS, CEILINGS, ETC.). PERMANENTLY SUPPORT AND INSTALL TEMPORARILY SUPPORTED ITEMS WHEN FINALIZED STRUCTURES ARE IN PLACE.
8. LEGALLY DISPOSE OF ALL REMOVED ITEMS UNLESS IDENTIFIED FOR REUSE. THE OWNER'S REPRESENTATIVE SHALL INSPECT ALL RETAINED ITEMS PRIOR TO PLACEMENT IN THE IDENTIFIED STORAGE LOCATION BY THE ELECTRICAL CONTRACTOR.
9. INCLUDE IN THIS CONTRACT ALL DEMOLITION SCOPE ASSOCIATED WITH LOW VOLTAGE SYSTEMS INCLUDING BUT NOT LIMITED TO TELEPHONE, DATA, SECURITY, PAGING, CCTV, ETC..
10. RECYCLE, BY A FACILITY APPROVED BY THE OWNER'S REPRESENTATIVE, REMOVED FLUORESCENT AND HID LAMPS AND BATTERIES. PREPARE A UNIFORM HAZARDOUS WASTE MANIFEST FOR ALL DISPOSALS AND RETURN WITH ALL APPLICABLE SIGN-OFFS PRIOR TO APPLICATION FOR FINAL PAYMENT.
11. VERIFY ALL BALLASTS IN LIGHTING FIXTURES TO BE DISPOSED OF ARE PCB FREE. CONSIDER ALL BALLASTS MANUFACTURED PRIOR TO 1979 AND NOT LABELED AS PCB FREE TO CONTAIN PCBs. PROVIDE WRITTEN REPRESENTATION TO THE OWNER'S REPRESENTATIVE THAT CONFIRMS PCB FREE WASTE. WHERE PCB FREE WASTE CANNOT BE VERIFIED, BALLASTS SHALL BE RECYCLED BY A FACILITY APPROVED BY THE OWNER'S REPRESENTATIVE, WITH PCB COMPONENTS ELIMINATED BY A HIGH TEMPERATURE INCINERATION. PREPARE A UNIFORM HAZARDOUS WASTE MANIFEST FOR ALL DISPOSALS AND RETURN WITH ALL APPLICABLE SIGNOFFS PRIOR TO APPLICATION FOR FINAL PAYMENT. ALL HANDLING SHALL CONFORM TO EPA REQUIREMENTS.
12. WORK MAY BE REQUIRED OUTSIDE OF THE PROJECT'S AREA OF RENOVATION. CONTRACTOR SHALL NOT ASSUME THAT AREA OF RENOVATION IS CONSIDERED THE SCOPE OF WORK AREA.

DEMOLITION / RELOCATION LEGEND

E	EXISTING ELECTRICAL EQUIPMENT, DEVICE AND/OR FIXTURE TO REMAIN
X	EXISTING ELECTRICAL EQUIPMENT, DEVICE AND/OR FIXTURE TO BE SELECTIVELY DEMOLISHED
XT	EXISTING ELECTRICAL EQUIPMENT DEVICE AND/OR FIXTURE TO BE REMOVED AND TURNED OVER TO OWNER FOR RE-USE
XR	EXISTING ELECTRICAL EQUIPMENT, DEVICE AND/OR FIXTURE TO BE REMOVED, STORED AND RE-LOCATED.
XL	EXISTING ELECTRICAL EQUIPMENT, DEVICE AND/OR FIXTURE INDICATED IN NEW LOCATION
XN	EXISTING ELECTRICAL EQUIPMENT, DEVICE SHALL BE REMOVED AND REPLACED WITH NEW; MAINTAIN EXISTING BOX, RACEWAY AND WIRING.

DEMOLITION / RELOCATION NOTES

PHASE LABELS SHOWN ABOVE ARE APPLIED IN SELECT AREAS AND MAY NOT ALWAYS BE PRESENT. REFER TO LINETYPE AND LINEWEIGHT TO DETERMINE EXISTING CONDITIONS AND DEMOLISHED EQUIPMENT.

PROJECT GENERAL NOTES

1. FURNISH LABOR, MATERIALS, TOOLS, AND OTHER EQUIPMENT REQUIRED TO INSTALL THE WORK SHOWN AND SPECIFIED. FURNISH AND INSTALL ITEMS NECESSARY FOR A COMPLETE ELECTRICAL SYSTEM. MATERIALS SHALL BE NEW AND BEAR THE REGISTERED UL MARK. WORK SHALL CONFORM WITH THE NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 70 (NEC), AND APPLICABLE FEDERAL, STATE AND LOCAL CODES. SECURE PERMITS AND PAY THE FEES REQUIRED TO CARRY OUT THE WORK. FURNISH COPIES OF CERTIFICATES AND PERMITS TO THE ARCHITECT.
2. THE DRAWINGS AND SPECIFICATIONS INDICATE THE INTENT OF THE DESIGN AND ARE CONSIDERED AS DIAGRAMMATIC ONLY. DETERMINE EXACT LOCATIONS FOR OUTLETS AND EQUIPMENT ON SITE AS WORK PROGRESSES. CHECK AND VERIFY DIMENSIONS AND CONDITIONS ON SITE. DOCUMENT FINAL WORK ON AS-BUILT RECORD DRAWINGS. CIRCUIT NUMBERS ARE FOR DESCRIPTIVE PURPOSES ONLY. EXACT NUMBERS TO BE DETERMINED IN THE FIELD AND NOTED ON THE CONTRACTOR AS BUILTS.
3. COORDINATE AND MAINTAIN THE CLEARANCES REQUIRED BY APPLICABLE FEDERAL, STATE AND LOCAL CODES FOR ALL PIPING, CONDUITS AND EQUIPMENT OF ALL TRADES.
4. CONDUIT RUNS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION OR EXPANSION DEFLECTION TYPE FITTINGS AS REQUIRED. VERIFY EXISTING JOINTS BY FIELD MEASUREMENTS.
5. RUN RACEWAYS AND CABLES CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED.
6. PROVIDE PANELBOARDS WITH DEDICATED SPACE EXTENDING FROM THE FLOOR TO THE STRUCTURAL CEILING WITH A WIDTH AND DEPTH OF THE EQUIPMENT, INCLUDING ANY ADDITIONAL SPACE DESCRIBED IN THE NEC. NO PIPING, DUCTS OR EQUIPMENT FOREIGN TO THE ELECTRICAL EQUIPMENT OR ARCHITECTURAL APPURTENANCES SHALL BE PERMITTED TO BE INSTALLED IN, ENTER OR PASS THROUGH SUCH SPACE.
7. MOUNT PANELBOARD SO THAT THE DISTANCE FROM THE TOP CIRCUIT BREAKER OPERATING HANDLE TO THE FLOOR SHALL NOT EXCEED 6'-6".
8. ALL BRANCH CIRCUITS SHALL HAVE A DEDICATED NEUTRAL CONDUCTOR. COMMON NEUTRALS WILL NOT BE ALLOWED.
9. OUTDOOR ELECTRICAL EQUIPMENT SHALL BE NEMA 3R TYPE, UNLESS OTHERWISE NOTED.
10. FURNISH GROUNDING/ BONDING BUSHINGS ONTO ALL CONDUIT ENTERING/LEAVING BOXES.
11. WHERE PANELS ARE INDICATED TO BE RELOCATED, TRACE OUT EACH CIRCUIT TO DETERMINE WHAT CIRCUITS FEED AREAS OUTSIDE THE SCOPE OF WORK. RE-ROUTE CIRCUITS WHICH MUST BE MAINTAINED TO THE NEW PANEL LOCATION BY PROVIDING AN ADEQUATELY SIZED PULL BOX AND SPLICING AND EXTENDING THE CONDUCTORS.
12. CURRENT CARRYING MATERIAL USED SHALL BE COPPER, INCLUDING PANELBOARD BUS MATERIALS AND TRANSFORMER WINDINGS.

ABBREVIATIONS

A	AMPERES
ACT	ACOUSTICAL CEILING TILE
AF	AMPERE FRAME
AFCI	ARC-FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFR	ARC FAULT REDUCTION
AIC	AMPERE INTERRUPTING CAPACITY
AL	ARC-FAULT CIRCUIT INTERRUPTER
ANN	ABOVE FINISHED FLOOR
ANSI	ABOVE FINISHED GRADE
ARCH	ARCHITECTURE
AT	AMPERE TRIP
ATC	AUTOMATIC TEMPERATURE CONTROL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BOND	BONDING JUMPER
BR	BRANCH
C	CONDUIT - RACEWAY
CAT	CATALOG
CB	CIRCUIT BREAKER
CD	CANDELA
CKT	CIRCUIT
CMS	CABLE MANAGEMENT SYSTEM
CLG	CEILING
COL	COLUMN
CMU	CONCRETE MASONRY UNIT
CT	CURRENT TRANSFORMER OR CABLE TRAY
CU	COPPER
CWS	CONDUIT WALL SEAL
DETD	DUAL ELEMENT TIME DELAY
DIA	DIAMETER
DP	DISTRIBUTION PANEL
DWG	DRAWING
EA	EACH
EC	ELECTRICAL CONTRACTOR
EGC	EQUIPMENT GROUND CONTRACTOR
ELEC	ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EO	ELECTRICALLY OPERATED
EPA	ENVIRONMENTAL PROTECTION AGENCY
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXP	EXPLOSION PROOF
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FLOUR	FLUORESCENT
FMS	FACILITIES MANAGEMENT SYSTEM
FT	FEET
FU	FUSE
G	GROUND
GA	GAUGE
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GF	GROUND FAULT
GFI	GROUND FAULT INTERRUPTER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
GWB	GYPSUM WALL BOARD
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTO
HP	HORSE POWER
HR	HOUR
HTR	HEATER
HVAC	HEATING, VENTILATION & AIR CONDITIONING
HZ	HERTZ
IC	INTERRUPTING CAPACITY
INC	INCANDESCENT
IMC	INTERMEDIATE METAL CONDUIT
JB	JUNCTION BOX
KAIC	THOUSAND AMPERES INTERRUPTING CAPACITY
KCMIL	THOUSAND CIRCULAR MILS
KEC	KITCHEN EQUIPMENT CONTRACTOR
KV	KILOVOLTS
kVA	KILOVOLT AMPERES
kVAR	KILOVOLT AMPERES REACTIVE
kW	KILOWATTS
kWH	KILOWATTS HOURS
LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, GROUND
LTG	LIGHTING
MAX	MAXIMUM
MC	METAL CLAD CABLE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MCSW	MOLDED CASE SWITCH
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MEP	MECHANICAL/ELECTRICAL/PLUMBING
MIN	MINIMUM
MISC	MISCELLANEOUS
MTD	MOUNTED
MTG	MOUNTING
MV	MEDIUM VOLTAGE
MLO	MAIN LUGS ONLY
N	NEUTRAL (GROUNDED CONDUCTOR)
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OCPD	OVER CURRENT PROTECTION DEVICE
PH	PHASE
PNL	PANEL
PNLBD	PANEL BOARD
POS	PROVIDE UNDER OTHER SECTIONS
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE RACEWAY
PWR	POWER
RGS	GALVANIZED RIGID STEEL CONDUIT
RMC	RIGID METAL CONDUIT
RNC	RIGID NON-METAL CONDUIT
RSC	RIGID STEEL CONDUIT
SATS	STANDBY AUTOMATIC TRANSFER SWITCH
SE	SERVICE ENTRANCE
SP	SPARE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCH GEAR
TEL	TELEPHONE
TL	TWIST LOCK
TP	TWISTED PAIR
TRANS	TRANSFORMER
TSP	TWISTED SHIELDED PAIR
V	VOLT
W/	WITH
W	WIRE
WP	WEATHERPROOF
Δ	DELTA
Y	WYE

THIS IS A STANDARD SYMBOL LIST. ALL DEVICE SYMBOLS AND ABBREVIATIONS MAY NOT NECESSARILY APPEAR ON THE DESIGN PLANS OR DETAIL SHEETS. ONLY THOSE SYMBOLS INDICATED ON THE DESIGN PLANS ARE USED AND OTHERS SHOULD BE DISREGARDED.

100%CD

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Woburn, Ma 01801
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Key Plan:

Owner:
CITY OF WORCESTER

Project Name:

Worcester-MA 18-20 E Worcester St - Gen

Worcester, MA

North Arrow

Stamp:
COMMONWEALTH OF MASSACHUSETTS
MICHAEL Y. PANG
ELECTRICAL
NO. 48483
REGISTERED PROFESSIONAL ENGINEER
03/28/2025

Rev.	Description	Date

Scale Bar:

Drawing Title:

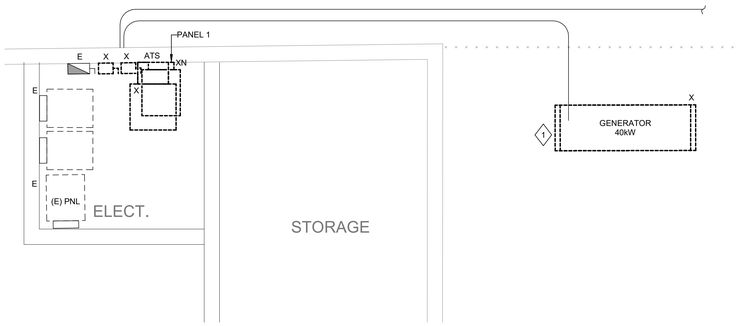
ELECTRICAL LEGEND, NOTES, AND ABBREVIATIONS

Date	03/28/2025
Scale	NTS
Drawn By	HK
Checked By	MP
Project Number	210538.13

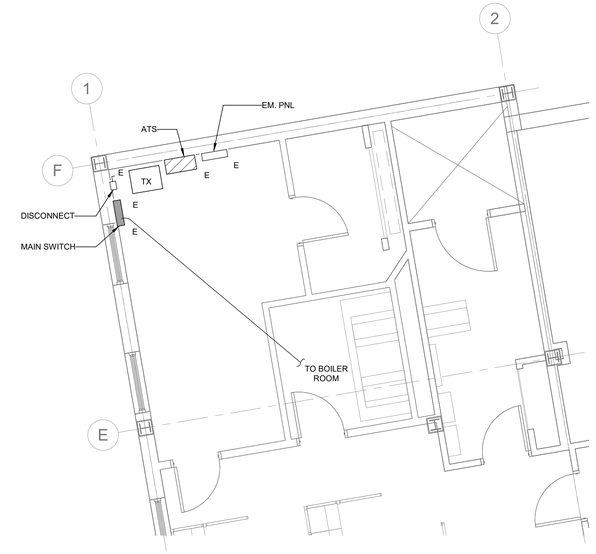
Drawing No.

E001

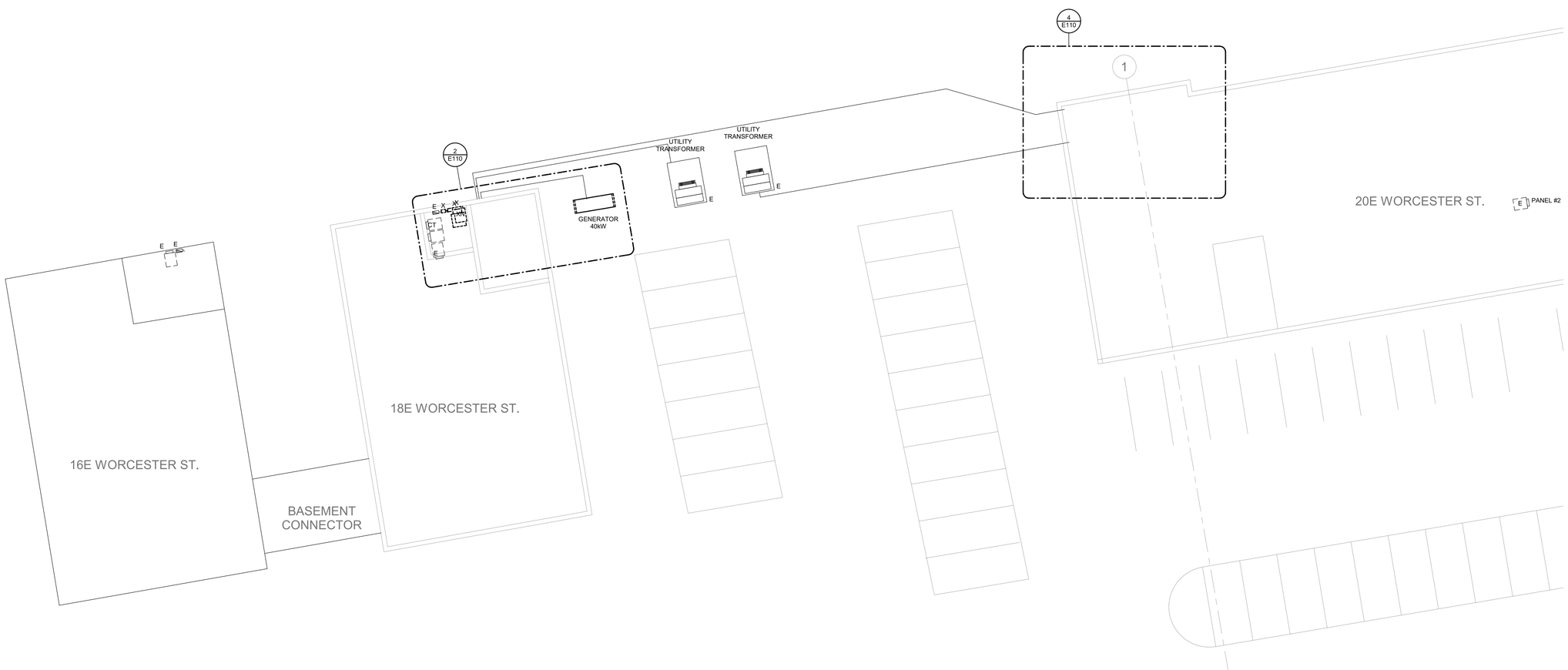
KEYNOTES	
1	DISCONNECT BATTERY CHARGER AND MAINTAIN EXISTING CIRCUIT FOR REUSE.



2 E110 ENLARGED DEMO VIEW OF GENERATOR
1/4" = 1'-0"
0 2' 4' 8'



4 E110 ELECTRICAL BASEMENT LEVEL POWER DEMOLITION PLAN
1/4" = 1'-0"
0 2' 4' 8'



1 E110 ELECTRICAL LEVEL 1 POWER DEMOLITION PLAN
3/32" = 1'-0"
0 8' 16' 24'

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COMMONWEALTH OF MASSACHUSETTS
MICHAEL Y. PANG
ELECTRICAL
NO. 48477
03/28/2025

Rev.	Description	Date

Scale Bar:

Drawing Title:

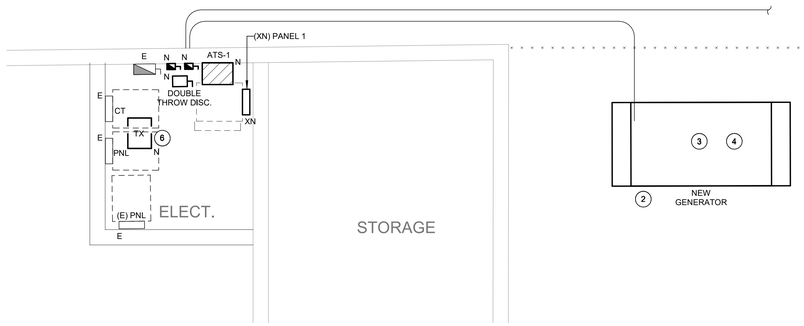
ELECTRICAL SITE POWER DEMOLITION PLAN

Date	03/28/2025
Scale	AS NOTED
Drawn By	HK
Checked By	MP
Project Number	210538.13

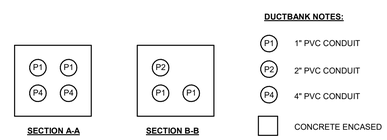
Drawing No.

E110

KEYNOTES	
1	COORDINATE WITH CITY OF WORCESTER FOR TRENCHING TO INSTALL NEW UNDERGROUND CONDUITS.
2	COORDINATE WITH CITY OF WORCESTER FOR TRENCHING TO MODIFY EXISTING CONCRETE PAD FOR THE NEW GENERATOR.
3	INSTALL NEW DIESEL GENERATOR IN SAME LOCATION AS REMOVED GENERATOR ON EXISTING CONCRETE PAD.
4	REFEED NEW BATTERY CHARGER WITH POWER REATAIN FROM DEMO PHASE.
5	PROVIDE NEW FEEDER CONDUCTOR IN EXISTING UNDERGROUND CONDUITS BETWEEN EXISTING ATS AND NEW GENERATOR, PERFORM NECESSARY TESTING AND PUT IN SERVICE.
6	HANG TRANSFORMER OFF STRUCTURAL CEILING



2 E111 ENLARGED NEW VIEW 18 EAST WORCESTER
1/4" = 1'-0"

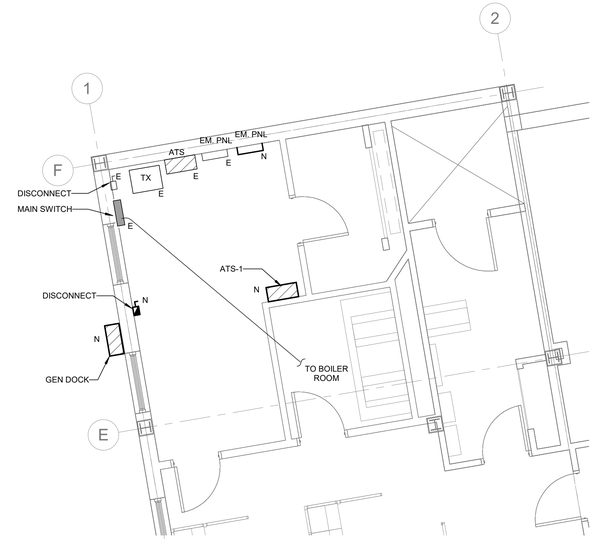


DUCTBANK NOTES:

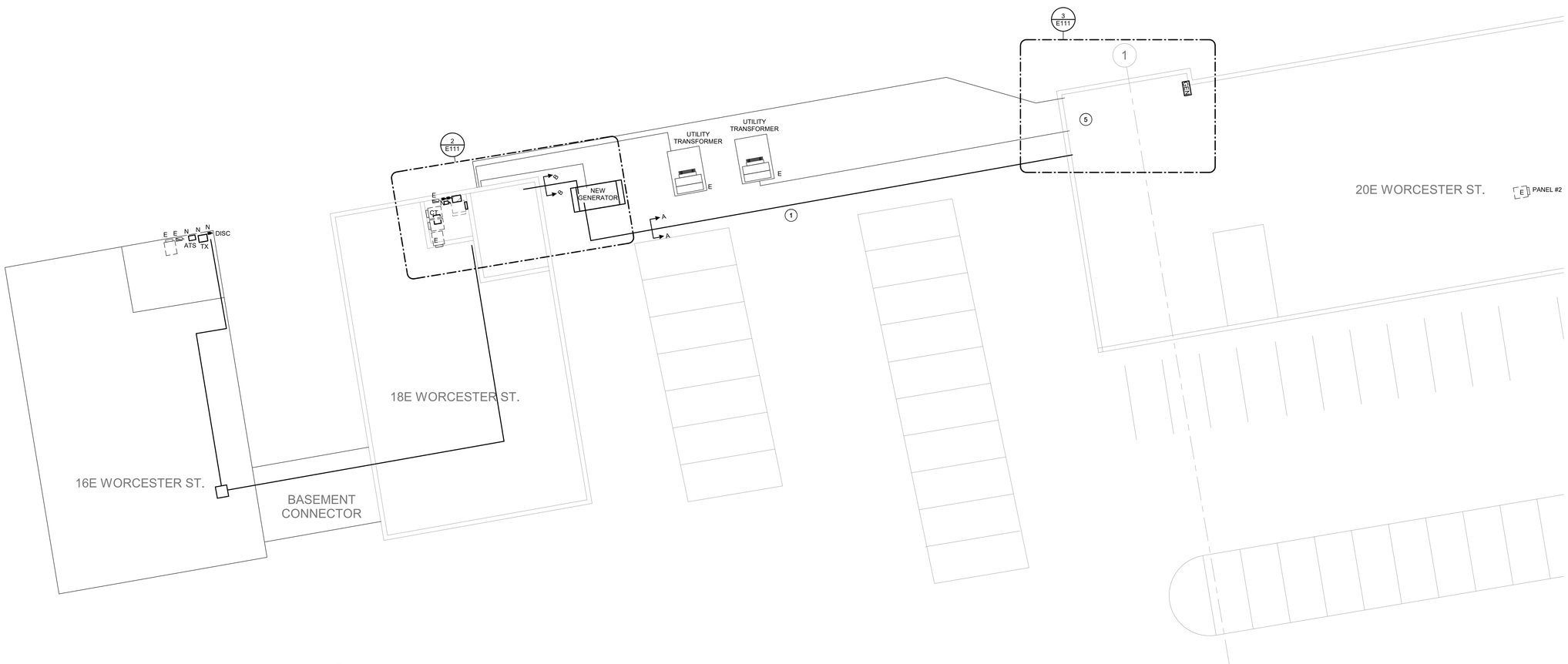
- P1 — 1" PVC CONDUIT
- P2 — 2" PVC CONDUIT
- P4 — 4" PVC CONDUIT
- CONCRETE ENCASED

NOTE:
PROVIDE ADD ALTERNATE FOR NEW DUCTBANK B-B IF EXISTING DUCTBANK CANNOT BE REUSED

4 E111 DUCT BANK DETAILS
NTS



3 E111 ENLARGED NEW VIEW 20 EAST WORCESTER
1/4" = 1'-0"



1 E111 ELECTRICAL POWER SITE PLAN
3/32" = 1'-0"

100%CD

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Key Plan:

Owner:
CITY OF WORCESTER

Project Name:

Worcester-MA 18-20 E Worcester St - Gen

Worcester, MA

North Arrow

Stamp:
COMMONWEALTH OF MASSACHUSETTS
MICHAEL Y. PANG
ELECTRICAL
NO. 48457
03/28/2025

Rev.	Description	Date

Scale Bar:

Drawing Title:

ELECTRICAL SITE POWER PLAN

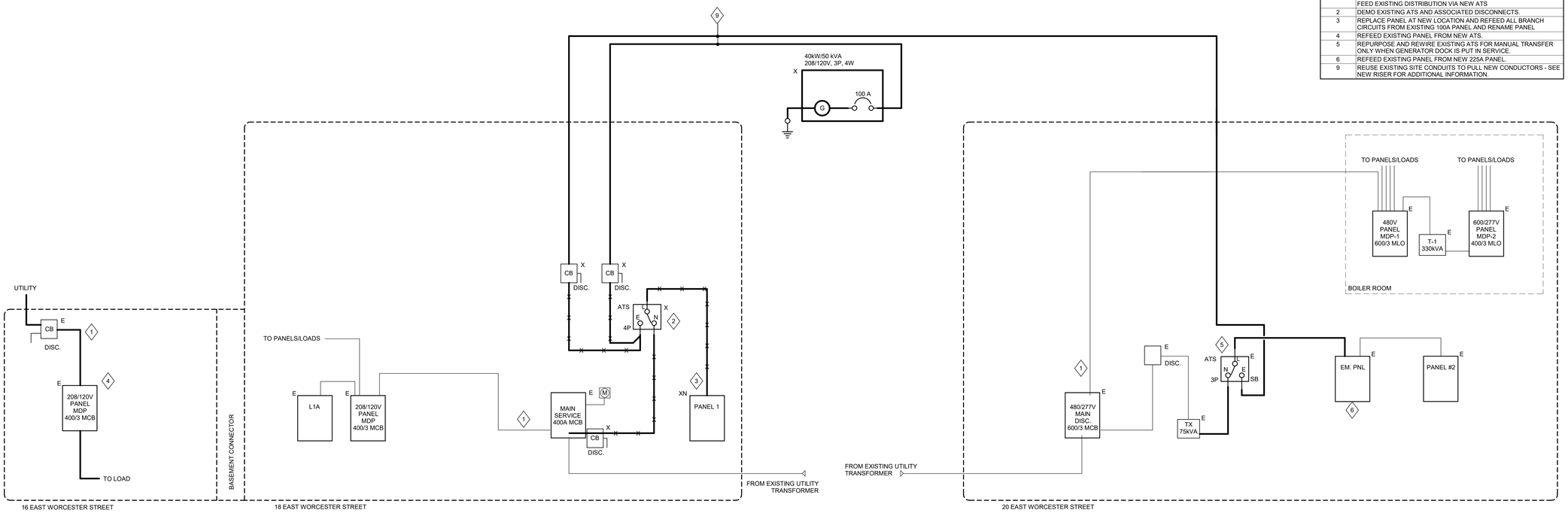
Date	03/28/2025
Scale	AS NOTED
Drawn By	HK
Checked By	MP
Project Number	210538.13

Drawing No.

E111

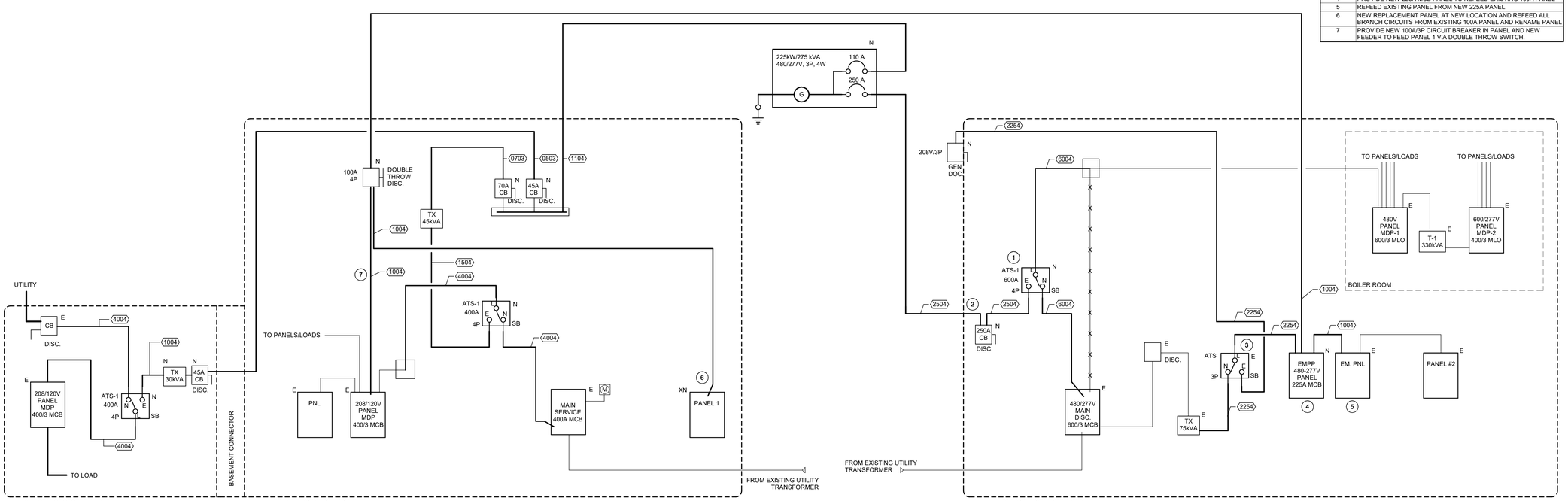
100%CD

KEYNOTES	
1	INTERCEPT EXISITNG FEEDER FROM LOAD SIDE OF DISCONNECT TO FEED EXISTING DISTRIBUTION VIA NEW ATS
2	DEMO EXISTING ATS AND ASSOCIATED DISCONNECTS.
3	REPLACE PANEL AT NEW LOCATION AND REFEED ALL BRANCH CIRCUITS FROM EXISTING 100A PANEL AND RENAME PANEL
4	REFEED EXISTING PANEL FROM NEW ATS.
5	REPURPOSE AND REWIRE EXISTING ATS FOR MANUAL TRANSFER ONLY WHEN GENERATOR DOCK IS PUT IN SERVICE.
6	REFEED EXISTING PANEL FROM NEW 225A PANEL.
9	REUSE EXISTING SITE CONDUITS TO PULL NEW CONDUCTORS - SEE NEW RISER FOR ADDITIONAL INFORMATION.



1 E700 EXISTING ELECTRICAL ONE-LINE DIAGRAM
NTS

KEYNOTES	
1	NEW ATS TO ALLOW BACKUP TO THE WHOLE BUILDING
2	NEW EMERGENCY FEEDER AND DISCONNECT FROM NEW GENERATOR.
3	REPURPOSE AND REWIRE EXISTING ATS FOR MANUAL TRANSFER ONLY WHEN GENERATOR DOCK IS PUT IN SERVICE.
4	PROVIDE NEW 225A MCB PANEL TO REFEED EXISTING 100A PANEL
5	REFEED EXISTING PANEL FROM NEW 225A PANEL.
6	NEW REPLACEMENT PANEL AT NEW LOCATION AND REFEED ALL BRANCH CIRCUITS FROM EXISTING 100A PANEL AND RENAME PANEL
7	PROVIDE NEW 100A/3P CIRCUIT BREAKER IN PANEL AND NEW FEEDER TO FEED PANEL 1 VIA DOUBLE THROW SWITCH.



2 E700 NEW ELECTRICAL ONE-LINE DIAGRAM
NTS

FITZEMEYER & TOCCI ASSOCIATES, INC.
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Key Plan:

Owner:
CITY OF WORCESTER

Project Name:

Worcester-MA 18-20 E Worcester St - Gen

Worcester, MA

North Arrow

Stamp:
COMMONWEALTH OF MASSACHUSETTS
MICHAEL Y. PANG
ELECTRICAL
NO. 48483
REGISTERED PROFESSIONAL ENGINEER
03/28/2025

Rev.	Description	Date

Scale Bar:

Drawing Title:

EXISTING ELECTRICAL RISER DIAGRAM

Date	03/28/2025
Scale	NTS
Drawn By	HK
Checked By	MP
Project Number	210538.13

Drawing No.

E700

LEGEND OF FEEDER SIZES

COPPER CONDUCTORS

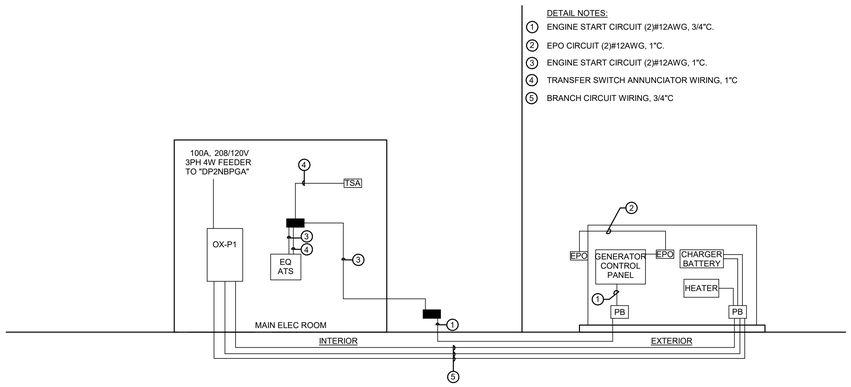
NOTES:
1. ALL CONDUCTOR SIZES ARE FOR COPPER CONDUCTORS NEC TABLE 310.16(2020); 75 DEGREE C.
2. CONDUIT SIZES ARE FOR COPPER CONDUCTORS WITH THHN/THWN INSULATION IN RMC PER NEC TABLE C.9 IN ANNEX C.
3. 600 KCMIL FEEDERS SHALL BE PROVIDED WITH MAC ADAPTERS AS REQUIRED TO COORDINATE WITH BREAKER LUG SIZES.
4. SEE SPECIFICATIONS FOR ACCEPTABLE CONDUCTOR TYPES.
5.CONTRACTOR SHALL PROVIDE PRICING INFORMATION FOR USE OF ALUMINUM FEEDERS AS ADD ALTERNATE #.

FEEDER SYMBOL	CONDUCTORS (3PH, 3W) WITH GROUND	RACEWAY SIZE	CONDUCTORS (3PH, 4W) WITH GROUND	RACEWAY SIZE	NOMINAL AMPERE
TX	REFER TO DRY TYPE TRANSFORMER SCHEDULE				
0703	3#4 & 1#8G	1"			70
0704			4#4 & 1#8G	1 1/4"	
0803	3#4 & 1#8G	1"			80
0804			4#4 & 1#8G	1 1/4"	
0903	3#3 & 1#8G	1 1/4"			90
0904			4#3 & 1#8G	1 1/4"	
1003	3#3 & 1#8G	1 1/4"			100
1004			4#3 & 1#8G	1 1/4"	
1103	3#2 & 1#6G	1 1/4"			110
1104			4#2 & 1#6G	1 1/4"	
1253	3#1 & 1#6G	1 1/4"			125
1254			4#1 & 1#6G	1 1/2"	
1503	3#1/0 & 1#6G	1 1/2"			150
1504			4#1/0 & 1#6G	2"	
1753	3#2/0 & 1#6G	2"			175
1754			4#2/0 & 1#6G	2"	
2003	3#3/0 & 1#6G	2"			200
2004			4#3/0 & 1#6G	2"	
2253	3#4/0 & 1#4G	2"			225
2254			4#4/0 & 1#4G	2 1/2"	
2503	3#250 KCMIL & 1#4G	2 1/2"			250
2504			4#250 KCMIL & 1#4G	2 1/2"	
3003	3#350 KCMIL & 1#4G	3"			300
3004			4#350 KCMIL & 1#4G	3"	
3503	3#500 KCMIL & 1#3G	3"			350
3504			4#500 KCMIL & 1#3G	3 1/2"	
4003	3#500 KCMIL & 1#3G	3"			400
4004			4#500 KCMIL & 1#3G	3 1/2"	
4503	6#4/0 & 2#2G	(2) 2"			450
4504			8#4/0 & 2#2G	(2) 2 1/2"	
5003	6#250KCMIL & 2#2G	(2) 2 1/2"			500
5004			8#250 KCMIL & 2#2G	(2) 2 1/2"	
6003	6#350KCMIL & 2#1G	(2) 3"			600
6004			8#350 KCMIL & 2#1G	(2) 3"	
8003	6#500KCMIL & 2#1/0G	(2) 3"			800
8004			8#500 KCMIL & 2#1/0G	(2) 3 1/2"	

BRANCH CIRCUIT WIRING LEGEND

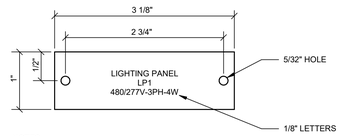
NOTES:
1. ALL CONDUCTOR SIZES ARE FOR COPPER CONDUCTORS NEC (2020); 75 DEGREE C.
2. CONDUIT SIZES ARE FOR COPPER CONDUCTORS WITH THHN/THWN INSULATION IN RMC.
3. CONDUIT AND CABLE SIZES SHALL BE PER TABLE BELOW UNLESS NOTED OTHERWISE ON THE FLOOR PLANS AND DRAWINGS.
4. SEE SPECIFICATIONS FOR ACCEPTABLE CONDUCTOR TYPES.

CIRCUIT SYMBOL	CONDUCTORS	CIRCUIT BREAKER
	120 & 277V 1PH, 2W CKTS	
201	2#12 & 1#12G - 3/4"C	20/1
301	2#10 & 1#10G - 3/4"C	30/1
401	2#8 & 1#10G - 3/4"C	40/1
501	2#8 & 1#10G - 3/4"C	50/1
601	2#6 & 1#10G - 3/4"C	60/1
	208 & 480V 1PH, 2W CKTS	
202	2#12 & 1#12G - 3/4"C	20/2
302	2#10 & 1#10G - 3/4"C	30/2
402	2#8 & 1#10G - 3/4"C	40/2
502	2#8 & 1#10G - 3/4"C	50/2
602	2#6 & 1#10G - 3/4"C	60/2
	208 & 480V 3PH, 3W CKTS	
203	3#12 & 1#12G - 3/4"C	20/3
303	3#10 & 1#10G - 3/4"C	30/3
403	3#8 & 1#10G - 3/4"C	40/3
503	3#8 & 1#10G - 3/4"C	50/3
603	3#6 & 1#10G - 3/4"C	60/3



1 TYPICAL GENERATOR SYSTEM WIRING DETAIL

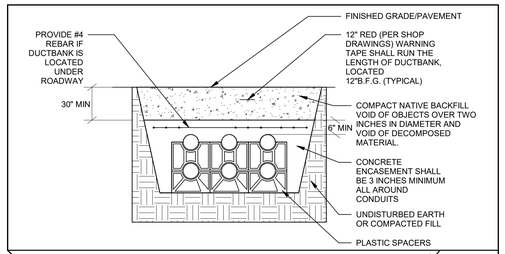
SCALE: NTS



NOTES:
1. NAMEPLATE TO BE CONSTRUCTED OF 1/16" THICK WHITE SURFACE WITH LETTER ENGRAVED INTO BLACK LAMINATIONS.
2. ALL NAMEPLATES SHALL BE SECURED BY MACHINE SCREWS.
3. NO NAMEPLATES SHALL BE PASTED ON.

3 TYPICAL NAMEPLATE DETAIL

SCALE: NTS



2 TYPICAL DUCT BANK DETAIL

SCALE: NTS

TYPICAL PANELBOARD NOTES

1. FURNISH ALL PANELBOARDS FULLY POPULATED WITH BRANCH CIRCUIT BREAKERS, THAT IS, ALL SPACES SHALL HAVE A 20AMP, 1 POLE CIRCUIT BREAKER INSTALLED.
2. PANEL FACE PLATES SHALL BE ATTACHED TO BACK BOX WITH FULL-LENGTH PIANO HINGE AND PROVIDED WITH LOCKING DOOR IN DOOR.
3. PANELBOARDS CONTAINING MAIN SERVICE DISCONNECT MUST BE LISTED FOR THE USE.
4. ALL CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE AND HACR RATED.

Branch Panel: (XN) PANEL 1

Location:
Supply From: (E) PNL
Mounting: SURFACE
Enclosure: NEMA1

Volts: 208Y/120
Phases: 3
Wires: 4

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 100 A
MCB Rating: 100 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1				0.00...	0.00...								2
3	(E) HWCP#1 VIA VFD	40 A	3			0.00...	0.00...			3	40 A	(E) HWCP#2 VIA VFD	4
5								0.00...	0.00...				6
7	(E) GENERATOR HEATER	20 A	1	0.00...	0.00...					1	20 A	(E) LIGHTING FIRST FLOOR	8
9	(E) PANEL QUAD	20 A	1			0.00...	0.00...			1	20 A	(E) LIGHTING FIRST FLOOR	10
11	(E) BOILER #1	20 A	1					0.00...	0.00...	1	20 A	(E) LIGHTING FIRST FLOOR	12
13	SPARE	20 A	1	0.00...	0.00...					1	20 A	(E) RADIO	14
15	SPARE	20 A	1			0.00...	0.00...			1	20 A	(E) PANEL RECEPTACLES	16
17	SPARE	20 A	1					0.00...	0.00...	1	20 A	(E) BOILER #2	18
19	SPARE	20 A	1	0.00...	0.00...					1	20 A	SPARE	20
21	SPARE	20 A	1			0.00...	0.00...			1	20 A	SPARE	22
23	SPARE	20 A	1					0.00...	0.00...	1	20 A	SPARE	24
25	SPARE	20 A	1	0.00...	0.00...					1	20 A	SPARE	26
27	SPARE	20 A	1			0.00...	0.00...			1	20 A	SPARE	28
29	SPARE	20 A	1					0.00...	0.00...	1	20 A	SPARE	30
31	SPARE	20 A	1	0.00...	0.00...					1	20 A	SPARE	32
33	SPARE	20 A	1			0.00...	0.00...			1	20 A	SPARE	34
35	SPARE	20 A	1					0.00...	0.00...	1	20 A	SPARE	36
37	SPARE	20 A	1	0.00...	0.00...					1	20 A	SPARE	38
39	SPARE	20 A	1			0.00...	0.00...			1	20 A	SPARE	40
41	SPARE	20 A	1					0.00...	0.00...	1	20 A	SPARE	42
			Total Load:	0.00 kVA		0.00 kVA		0.00 kVA					
			Total Amps:	0 A		0 A		0 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
				Total Conn. Load:	0.00 kVA
				Total Est. Demand:	0.00 kVA
				Total Conn.:	0 A
				Total Est. Demand:	0 A

100%CD

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Key Plan:

Owner:
CITY OF WORCESTER

Project Name:

Worcester-MA 18-20 E
Worcester St - Gen

Worcester, MA

North Arrow

Stamp:
COMMONWEALTH OF MASSACHUSETTS
MICHAEL Y. PANG
ELECTRICAL
NO. 48483
REGISTERED PROFESSIONAL ENGINEER
03/28/2025

Rev.	Description	Date

Scale Bar:

Drawing Title:

ELECTRICAL SCHEDULES AND DETAILS

Date	03/28/2025
Scale	NTS
Drawn By	HK
Checked By	MP
Project Number	210538.13

Drawing No.

E900

RACEWAY SUPPORT LEGEND

TELE/DATA TAGS

DEVICE INDICATOR LETTER "X" COMMUNICATES CONNECTION TYPE

OPTIONAL TYPE DESIGNATOR
"BLANK" - TELE/DATA DEVICE WITH NO OPTION
"C" - MOUNTED 8" ABOVE WORK SURFACE OR COUNTERTOP
"H" - MOUNTED HIGH ON WALL

WALL	CLG	FLR	TELE/DATA SYMBOL DESCRIPTION
			DATA ONLY OUTLET DEVICE
			VOICE / DATA COMBINATION OUTLET DEVICE
			VOICE ONLY OUTLET DEVICE

TELE/DATA NOTES

1. ALL WALL MOUNTED DEVICES ARE TO BE MOUNTED 18" AFF UNLESS OTHERWISE NOTED.
2. COORDINATE MOUNTING HEIGHTS WITH THE ARCHITECT PRIOR TO INSTALLATION.
3. BACK BOX AND TO BE PROVIDED WITH 1"C (WITH PULL STRING) RUN CONCEALED WITHIN WALL TO ABOVE FINISHED CEILING AND TERMINATING WITHIN 6" OF CABLE TRAY. WIRING AND DEVICES BY OTHERS.

DEVICE SYMBOLS	DEVICE SYMBOL DESCRIPTION
	3/4" THICK x 8'-0" HIGH x LENGTH AS INDICATED ON THE DRAWINGS PLYWOOD. PLYWOOD SHALL BE PAINTED GRAY AND MOUNTED TO WALL.
AV	2-GANG BACKBOX WITH SINGLE GANG PLASTER RING AND COVERPLATE

COMMUNICATION DEVICE NOTES

1. COORDINATE EXACT LOCATION OF SECURITY CAMERAS AND CCTV'S WITH OWNER AND SECURITY VENDOR PRIOR TO INSTALLATION.

WIRING LEGEND

J	J-HOOK CABLE MANAGEMENT TYPICALLY MOUNTED 6" ABOVE FINISHED CEILING
	CABLE TRAY (WITH FITTING)
	FITTING CONDUIT TURNING UP
	CONDUIT TURNING DOWN
	CONDUIT STUBBED 6" ABOVE ACCESSIBLE CEILING AT 90° ANGLE WITH BUSHED END
	FLEXIBLE RACEWAY
PP123 / 5	HOMERUN TO PANELBOARD "PP123"; BRANCH CIRCUIT No. 5; 2#12 & 1#12G., 3/4"C. UNLESS OTHERWISE NOTED.

WIRING METHODS

REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION

NOTE: SIZE AND INSTALL BRANCH CIRCUIT CONDUCTORS FOR A MAXIMUM BRANCH CIRCUIT VOLTAGE DROP OF 3% FROM PANELBOARDS. TOTAL VOLTAGE DROP FROM SERVICE ENTRY TO LAST DEVICE ON THE CIRCUIT TO NOT EXCEED 5%. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND OPTIONS.

NORMAL SYSTEM FEEDERS	THHN/THWN/XHHW CONDUCTORS IN EMT
EMERGENCY SYSTEM FEEDERS	MI CABLE
EQUIPMENT SYSTEM FEEDERS	THHN/THWN/XHHW CONDUCTORS IN EMT
NORMAL BRANCH CIRCUITS	THHN/THWN/XHHW CONDUCTORS IN EMT OR HOSPITAL GRADE AC CABLE
EMERGENCY SYSTEM (LIFE SAFETY AND CRITICAL) BRANCH CIRCUITS	THHN/THWN/XHHW CONDUCTORS IN EMT
NURSE CALL SYSTEM WIRING	CONDUCTORS IN EMT
TELEDATA WIRING	CAT6 WIRING IN EMT (REFER TO COMMUNICATIONS LEGEND FOR ADDITIONAL INFORMATION)

POWER LEGEND

PANEL TAGS

"BUILDING NUMBER"
- "CR" - CRITICAL
- "LS" - LIFE SAFETY
- "EQ" - EQUIPMENT BRANCH
- "E" - EMERGENCY
- "LX" - LEGAL STANDBY
- "OX" - OPTIONAL STANDBY
- "S" - SWITCHBOARD
- "D" - DISTRIBUTION PANEL
- "L" - LIGHTING
- "M" - MECHANICAL
- "K" - KITCHEN PANEL
- "P" - POWER
- FLOOR
- SEQUENTIAL PANEL NUMBER PER FLOOR

#-XXX##

NOTE: PANEL NAMES MAY NOT USE ALL TAG LANGUAGE.

PANEL MOUNTING SYMBOL DESCRIPTION

	FLUSH MOUNTED PANELBOARD
	SURFACE MOUNTED PANELBOARD

PANEL HATCH SYMBOL DESCRIPTION

	240/ 208/ 120V PANELBOARD
	600/ 480/ 277V PANELBOARD
	240/ 208/ 120V DISTRIBUTION BOARD
	600/ 480/ 277V DISTRIBUTION BOARD

POWER SYMBOLS	POWER SYMBOL DESCRIPTION
	DISCONNECT SWITCH - NEMA 1 ENCLOSURE - UNFUSED DISCONNECT SWITCH - NEMA 1 ENCLOSURE - FUSED
60AS 3P / 40AF	60AS - DENOTES SWITCH AMPERAGE RATING; 3P - DENOTES 3-POLE 40AF - DENOTES FUSE AMPERAGE RATING 30A/3P UNLESS OTHERWISE NOTED
$M	MANUAL MOTOR STARTER - INTEGRAL THERMAL PROTECTION
VFD	VARIABLE FREQUENCY DRIVE
T#	DRY TYPE TRANSFORMER # - SIZE, REFER TO TRANSFORMER SCHEDULE
GTA	GENERATOR ANNUNCIATOR PANEL
ATSA	ATS ANNUNCIATOR PANEL

SITE LEGEND

HH	HANDHOLE
EM	ELECTRIC MANHOLE
TM	TELEPHONE / DATA MANHOLE
EH	ELECTRIC HANDHOLE
TH	TELEPHONE / DATA HANDHOLE
M	UTILITY SERVICE METER
UP-1	UTILITY POLE
LC	LIGHTING CONTACTOR
TC	TIME CLOCK

DEVICE LEGEND

RECEPTACLE TAGS

OPTIONAL TYPE DESIGNATOR
"BLANK" - RECEPTACLE WITH NO OPTION
"GFI" - GROUND FAULT INTERRUPTER
"C" - MOUNTED 8" ABOVE WORK SURFACE OR COUNTERTOP
"REF" - MOUNTED AT 48" FOR FULL HEIGHT REFRIGERATOR
"UC" - MOUNTED UNDER CABINET
"WP" - WEATHERPROOF TYPE: NEMA 3R MINIMUM
"WR" - WEATHER RESISTANT DEVICE AND IN-USE COVER
"TR" - TAMPER RESISTANT
"USB" - COMBINATION USB DEVICE
"CP" - RECEPTACLE MOUNTED IN CEILING FOR PROJECTOR
"PT" - 2 HOUR FIRE RATED POKE-THROUGH
"TV" - MOUNTED HIGH ON WALL BEHIND TELEVISION.
"H" - MOUNTED HIGH ON WALL
"HS" - HALF SWITCHED
"USB" - COMBINATION USB/DUPLEX RECEPTACLE

PANELBOARD BRANCH CIRCUIT NUMBER

REC SYMBOLS (WALL / CLG / FLR)	RECEPTACLE SYMBOL DESCRIPTION
	DUPLEX RECEPTACLE
	DOUBLE DUPLEX RECEPTACLE
	SINGLE RECEPTACLE
	DUPLEX RECEPTACLE, ON GENERATOR
	DOUBLE DUPLEX RECEPTACLE, ON GENERATOR
	SINGLE RECEPTACLE, ON GENERATOR
	HOSPITAL GRADE, DUPLEX RECEPTACLE
	HOSPITAL GRADE, DOUBLE DUPLEX RECEPTACLE
	HOSPITAL GRADE, DUPLEX RECEPTACLE, ON GENERATOR
	HOSPITAL GRADE, DOUBLE DUPLEX RECEPTACLE, ON GENERATOR
S1 / S2	SPECIAL PURPOSE RECEPTACLE NEMA TYPE AS INDICATED ON THE PLANS

RECEPTACLE NOTES

1. ALL RECEPTACLES ARE MOUNTED 18" AFF UNLESS OTHERWISE NOTED.
2. COORDINATE MOUNTING HEIGHTS WITH THE ARCHITECT PRIOR TO INSTALLATION.
3. ALL RECEPTACLES SHALL BE NEMA 5-20R UNLESS OTHERWISE NOTED.
4. PROVIDE ALL RECEPTACLES WITHIN 6'-0" OF A SINK WITH GFCI PROTECTION.

JUNCTION BOX TAGS

DEVICE INDICATOR LETTER "X" COMMUNICATES CONNECTION TYPE

OPTIONAL TYPE DESIGNATOR
"BLANK" - JUNCTION BOX WITH NO OPTION
"ADO" - AUTOMATIC DOOR OPERATOR
"ATC" - AUTOMATIC TEMPERATURE CONTROLS
"B" - JUNCTION BOX WITH BLANK COVER
"CCTV" - CLOSED CIRCUIT SECURITY CAMERA
"ELF" - ELECTRONIC FAUCET OR FLUSH VALVE
"EM" - EMERGENCY POWER CIRCUIT AS INDICATED
"EWC" - ELECTRIC WATER COOLER
"NM" - NORMAL POWER CIRCUIT AS INDICATED
"PS" - MOTORIZED PROJECTION SCREEN
"SEC" - SECURITY DEVICES
"T/D" - TEL/DATA WIRING
"USB" - COMBINATION USB DEVICE
"BAT" - BATTERY CHARGER

WALL	CLG	FLR	JUNCTION BOX SYMBOL DESCRIPTION
			JUNCTION BOX

DEVICE SYMBOLS	DEVICE SYMBOL DESCRIPTION
ECB	ENCLOSED CIRCUIT BREAKER - NEMA 1 ENCLOSURE
PB	PULL BOX
ADO	PUSHBUTTON - REFER TO ARCHITECT'S DOOR HARDWARE SCHEDULE FOR EXACT REQUIREMENTS "ADO" - AUTOMATIC DOOR OPENER "EPO" - EMERGENCY PUSH OFF

GROUNDING LEGEND

	GROUNDING COUNTERPOISE - (3) COPPER GROUND RODS AT 10'-0" ON CENTER
GND	GROUNDING CONDUCTOR; 1/0 CU GND MINIMUM - UNLESS NOTED OTHERWISE
	GROUND ROD
	GROUND BAR - 2"H x 1/4" THICK x 18"L, MOUNTED 24" AFF WITH 2" SPACE BETWEEN GROUND BUS AND WALL
	GROUNDING ELECTRODE CONDUCTOR OF SEPARATELY DERIVED SYSTEM.

MECHANICAL EQUIPMENT COORDINATION

ELECTRICAL CONTRACTOR SHALL REFER TO THE MECHANICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS AND SPECIFICATIONS FOR LOCATIONS AND QUANTITIES OF EQUIPMENT RELEASED TO EACH TRADE.

$M VFD	PROVIDED BY ELECTRICAL CONTRACTOR
$M VFD	PROVIDED BY MECHANICAL CONTRACTOR

LIGHTING LEGEND

LIGHTING TAGS

"LP" - LIGHTING PENDENT
"LD" - LIGHTING DOWNLIGHT
"LS" - LIGHTING SURFACE MOUNTED
"LR" - LIGHTING RECESSED
"SL" - SITE LIGHTING
"NL" - NIGHT LIGHT

1,2,3 ETC. - NUMERAL TYPE DESIGNATOR

OPTIONAL TYPE DESIGNATOR
"BLANK" - NORMAL POWER
"E" - PROVIDED WITH EMERGENCY BATTERY

PANELBOARD BRANCH CIRCUIT NUMBER

LOWERCASE LETTER DENOTES LOCAL SWITCH

REFER TO LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION PERTAINING TO EACH FIXTURE TYPE LISTED ON PLAN DRAWINGS

LIGHTING SYMBOLS	LIGHTING SYMBOL DESCRIPTION
LR1	SURFACE OR RECESSED MOUNTED LIGHTING FIXTURE
LR1	RECESSED LINEAR WALL WASH
LS1	STRIP LIGHTING FIXTURE
LS1	COMMERCIAL STRIP LIGHTING FIXTURE
LS1	WALL MOUNTED LIGHTING FIXTURE
LS1	TRACK MOUNTED LIGHTING FIXTURE
	REMOTE EMERGENCY LIGHTING, SINGLE HEAD MOUNT 7'-6" AFF
	REMOTE EMERGENCY LIGHTING, DUAL HEAD MOUNT 7'-6" AFF
	EMERGENCY BATTERY UNIT, MOUNT 7'-6" AFF; NO. OF EMERGENCY LIGHTING HEADS AS INDICATED.
SL1	SITE LIGHTING FIXTURE
SL2	STRIP LIGHTING BOLLARD
LD1 (WALL / CLG)	CIRCULAR LIGHT FIXTURE
	EXIT SIGN - SHADED AREA INDICATES LOCATION AND QUANTITY OF FACES; DIRECTIONAL ARROWS AS INDICATED

LIGHT FIXTURE CONNECTED TO:

NORMAL BRANCH CIRCUITRY	EMERGENCY BRANCH CIRCUITRY
CRITICAL BRANCH CIRCUITRY	LIFE SAFETY BRANCH CIRCUITRY
LEGALLY REQUIRED STANDBY	OPTIONAL STANDBY BRANCH CIRCUITRY

SWITCHES LEGEND

DEVICE INDICATOR LETTER "X" EQUALS DESIGNATION BELOW
WALL MOUNTED SWITCHES TO BE AT 48" AFF UNO

"EMPTY" - SINGLE POLE SWITCH
"2" - TWO POLE, SINGLE THROW SWITCH
"3" - 3-WAY, SINGLE POLE, DOUBLE THROW
"4" - 4-WAY, DOUBLE POLE, DOUBLE THROW
"D" - DIMMER SWITCH, SINGLE POLE
"LV" - LOW VOLTAGE
"MS" - MASTER STATION OVERRIDE
"WP" - WEATHERPROOF
"OS" - OCCUPANCY SENSOR - WALL MOUNTED, INTEGRAL DUAL TECHNOLOGY, SINGLE POLE SWITCH
"a" - SMALL CASE LETTER DENOTES LIGHT FIXTURE CONTROL

OS	OCCUPANCY SENSOR - WALL MOUNTED, INTEGRAL DUAL TECHNOLOGY, DUAL RELAY SWITCH.
OS	OCCUPANCY SENSOR - CEILING MOUNTED, INTEGRAL DUAL TECHNOLOGY, DUAL RELAY SWITCH.
VS	VACANCY SENSOR - WALL MOUNTED, INTEGRAL DUAL TECHNOLOGY.
VS	VACANCY SENSOR - CEILING MOUNTED, INTEGRAL DUAL TECHNOLOGY.
PC	PHOTOCELL - CEILING MOUNTED
PC	PHOTOCELL - WALL MOUNTED

FOR CEILING MOUNTED OCCUPANCY SENSORS:
PROVIDE THE APPROPRIATE QUANTITY OF POWER SUPPLIES FOR SINGLE AND MULTIPLE LEVEL SWITCHING. REFER TO FLOOR PLANS FOR SWITCHING LAYOUTS TO DETERMINE EXACT QUANTITY OF POWER SUPPLIES

ONE LINE DIAGRAM LEGEND

CR43A1	PANELBOARD "CR43A1"
	TRANSFER SWITCH "ATS" = AUTOMATIC TRANSFER SWITCH "MTS" = MANUAL TRANSFER SWITCH
BP	"BP" = BYPASS ISOLATION SWITCH
LS	"LS" = LIFE SAFETY BRANCH "CR" = CRITICAL BRANCH "EQ" = EQUIPMENT BRANCH "ELEV" = ELEVATOR BRANCH "X-RAY" = X-RAY EQUIPMENT BRANCH "EM" = EMERGENCY "LR" = LEGALLY REQUIRED "OS" = OPTIONAL STANDBY
4P	"3P" = NUMBER OF POLES; 3 POLE "4P" = NUMBER OF POLES; 4 POLE
	GROUND CONNECTION
SPD	SURGE PROTECTIVE DEVICE
100AF 60AT 3P	CIRCUIT BREAKER DRAW OUT 100AF - DENOTES CIRCUIT BREAKER FRAME 60AT - DENOTES CIRCUIT BREAKER TRIP
100AF 60AT 3P	CIRCUIT BREAKER FIXED 100AF - DENOTES CIRCUIT BREAKER FRAME 60AT - DENOTES CIRCUIT BREAKER TRIP
	TRANSFORMER - BOX REPRESENTS PAD MOUNTED
CT	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	DISCONNECT SWITCH FUSED / LOW VOLTAGE FUSIBLE SWITCH
	DISCONNECT SWITCH UNFUSED
	MEDIUM VOLTAGE FUSIBLE SWITCH
	FUSE
K	KIRK KEY INTERLOCK
V	VOLTMETER
ST	SHUNT TRIP DEVICE

RECEPTACLE NOTES

1. REFER TO DEMOLITION / RELOCATION LEGEND FOR LINETYPE AND LINEWEIGHT TO DETERMINE EXISTING CONDITIONS AND DEMOLISHED EQUIPMENT.

DRAWING LIST

SHEET NUMBER	SHEET NAME
E000	ELECTRICAL LEGEND
E111	ELECTRICAL LEVEL 1 POWER DEMOLITION PLAN
E311	ELECTRICAL LEVEL 1 POWER PLAN
E700	ELECTRICAL SCHEDULES AND RISER DIAGRAM
E900	ELECTRICAL DETAILS

THIS IS A STANDARD SYMBOL LIST. ALL DEVICE SYMBOLS AND ABBREVIATIONS MAY NOT NECESSARILY APPEAR ON THE DESIGN PLANS OR DETAIL SHEETS. ONLY THOSE SYMBOLS INDICATED ON THE DESIGN PLANS ARE USED AND OTHERS SHOULD BE DISREGARDED.

100%CD

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Key Plan:

Owner:
City of Worcester

Project Name:
Worcester-MA - Gen Repl

Worcester, MA.

North Arrow

Stamp:
COMMONWEALTH OF MASSACHUSETTS
MICHAEL Y. PANG
ELECTRICAL
NO. 48483
REGISTERED PROFESSIONAL ENGINEER
03/28/2025

Rev.	Description	Date

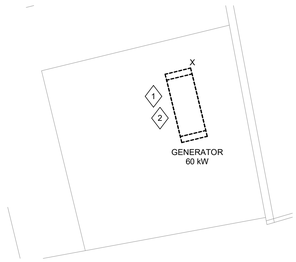
Scale Bar:

Drawing Title:
ELECTRICAL LEGEND

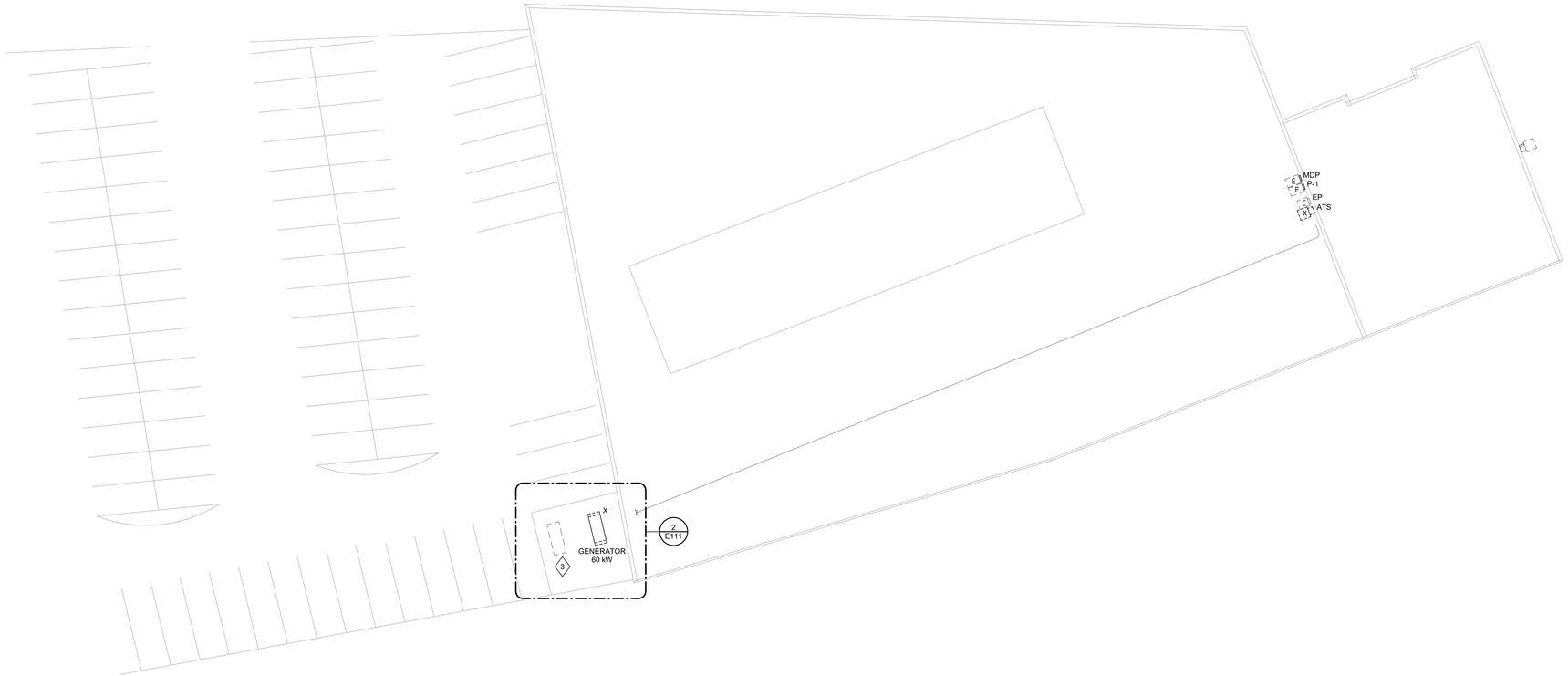
Date	03/28/2025
Scale	NTS
Drawn By	HK
Checked By	MP
Project Number	210538.12

Drawing No.
E000

KEYNOTES	
1	COORDINATE WITH PLUMBING CONTRACTOR TO DISCONNECT NATURAL GAS TO ALLOW THE REMOVAL OF GENERATOR.
2	DISCONNECT BATTERY CHARGER AND MAINTAIN EXISTING CIRCUIT FOR REUSE.
3	<varies>



2 E111 ENLARGED DEMO VIEW OF GENERATOR
1/8" = 1'-0"
0 4' 8' 16'



1 E111 ELECTRICAL LEVEL 1 POWER DEMOLITION PLAN
1/16" = 1'-0"
0 8' 16' 32'

100%CD

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PROFESSIONAL ENGINEER
03/28/2025

Rev.	Description	Date

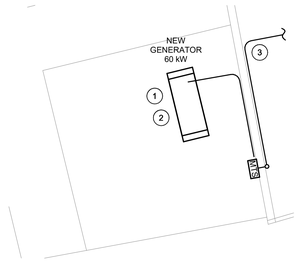
Scale Bar:

Drawing Title:
ELECTRICAL LEVEL 1 POWER DEMOLITION PLAN

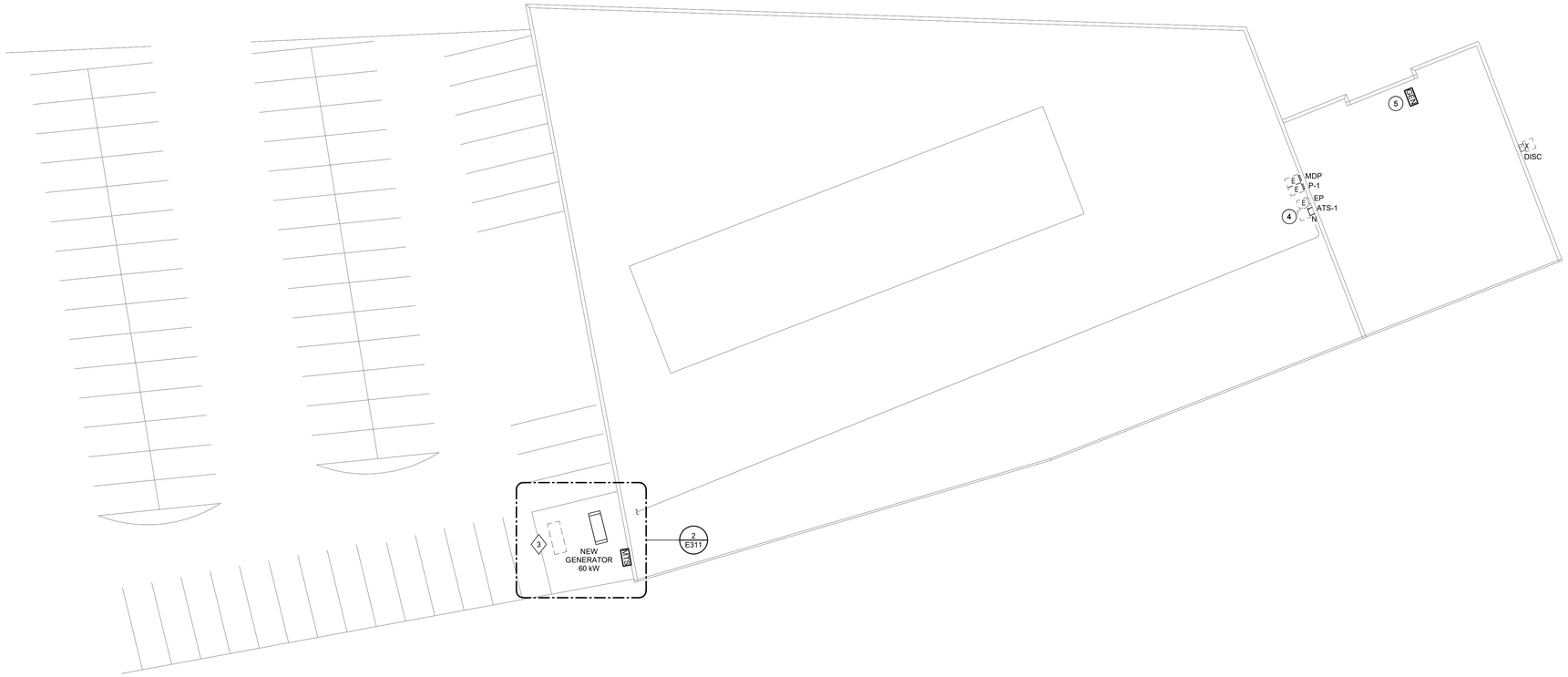
Date	03/28/2025
Scale	As indicated
Drawn By	HK
Checked By	MP
Project Number	210538.12

Drawing No.
E111

KEYNOTES	
1	INSTALL NEW 60 kW DIESEL GENERATOR ON EXISTING CONCRETE PAD.
2	REFEED NEW BATTERY CHARGER AND BLOCK HEATER WITH POWER REATAIN FROM DEMO PHASE.
3	REWORK EXISTING FEEDER CONDUITS TO INSTALL NEW MTS. PROVIDE NEW FEEDER CONDUCTORS TO/FROM NEW ATS. SEE RISER DIAGRAM FOR ADDITIONAL INFORMATION.
4	REWORK EXISTING FEEDER CONDUITS TO INSTALL NEW ATS. PROVIDE NEW FEEDER CONDUCTORS TO/FROM NEW ATS. SEE RISER DIAGRAM FOR ADDITIONAL INFORMATION.
5	INSTALL NEW GENERATOR ANNUNCIATOR PANEL IN THE MAIN ENTRANCE VESTIBULE.



2 E311 ENLARGED NEW VIEW OF GENERATOR
1/8" = 1'-0"
0 4' 8' 16'



1 E311 ELECTRICAL POWER 1ST FLOOR PLAN
1/16" = 1'-0"
0 8' 16' 32'

100%CD

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Owner:
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PROFESSIONAL ENGINEER
03/28/2025

Rev.	Description	Date

Scale Bar:

Drawing Title:
ELECTRICAL LEVEL 1 POWER PLAN

Date	03/28/2025
Scale	As indicated
Drawn By	HK
Checked By	MP
Project Number	210538.12

Drawing No.
E311

LEGEND OF FEEDER SIZES

COPPER CONDUCTORS

NOTES:
1. ALL CONDUCTOR SIZES ARE FOR COPPER CONDUCTORS NEC TABLE 310.16(2020); 75 DEGREE C.
2. CONDUIT SIZES ARE FOR COPPER CONDUCTORS WITH THHN/THWN INSULATION IN RMC PER NEC TABLE C.9 IN ANNEX C.
3. 600 KCMIL FEEDERS SHALL BE PROVIDED WITH MAC ADAPTERS AS REQUIRED TO COORDINATE WITH BREAKER LUG SIZES.
4.SEE SPECIFICATIONS FOR ACCEPTABLE CONDUCTOR TYPES.
5.CONTRACTOR SHALL PROVIDE PRICING INFORMATION FOR USE OF ALUMINUM FEEDERS AS ADD ALTERNATE #.

FEEDER SYMBOL	CONDUCTORS (3PH, 3W) WITH GROUND	RACEWAY SIZE	CONDUCTORS (3PH, 4W) WITH GROUND	RACEWAY SIZE	NOMINAL AMPERE
TX	REFER TO DRY TYPE TRANSFORMER SCHEDULE				
0703	3#4 & 1#8G	1"			70
0704			4#4 & 1#8G	1 1/4"	
0803	3#4 & 1#8G	1"			80
0804			4#4 & 1#8G	1 1/4"	
0903	3#3 & 1#8G	1 1/4"			90
0904			4#3 & 1#8G	1 1/4"	
1003	3#3 & 1#8G	1 1/4"			100
1004			4#3 & 1#8G	1 1/4"	
1103	3#2 & 1#6G	1 1/4"			110
1104			4#2 & 1#6G	1 1/4"	
1253	3#1 & 1#6G	1 1/4"			125
1254			4#1 & 1#6G	1 1/2"	
1503	3#1/0 & 1#6G	1 1/2"			150
1504			4#1/0 & 1#6G	2"	
1753	3#2/0 & 1#6G	2"			175
1754			4#2/0 & 1#6G	2"	
2003	3#3/0 & 1#6G	2"			200
2004			4#3/0 & 1#6G	2"	
2253	3#4/0 & 1#4G	2"			225
2254			4#4/0 & 1#4G	2 1/2"	
2503	3#250 KCMIL & 1#4G	2 1/2"			250
2504			4#250 KCMIL & 1#4G	2 1/2"	
3003	3#350 KCMIL & 1#4G	3"			300
3004			4#350 KCMIL & 1#4G	3"	
3503	3#500 KCMIL & 1#3G	3"			350
3504			4#500 KCMIL & 1#3G	3 1/2"	
4003	3#500 KCMIL & 1#3G	3"			400
4004			4#500 KCMIL & 1#3G	3 1/2"	
4503	6#4/0 & 2#2G	(2) 2"			450
4504			8#4/0 & 2#2G	(2) 2 1/2"	
5003	6#250KCMIL & 2#2G	(2) 2 1/2"			500
5004			8#250 KCMIL & 2#2G	(2) 2 1/2"	
6003	6#350KCMIL & 2#1G	(2) 3"			600
6004			8#350 KCMIL & 2#1G	(2) 3"	
8003	6#500KCMIL & 2#1/0G	(2) 3"			800
8004			8#500 KCMIL & 2#1/0G	(2) 3 1/2"	

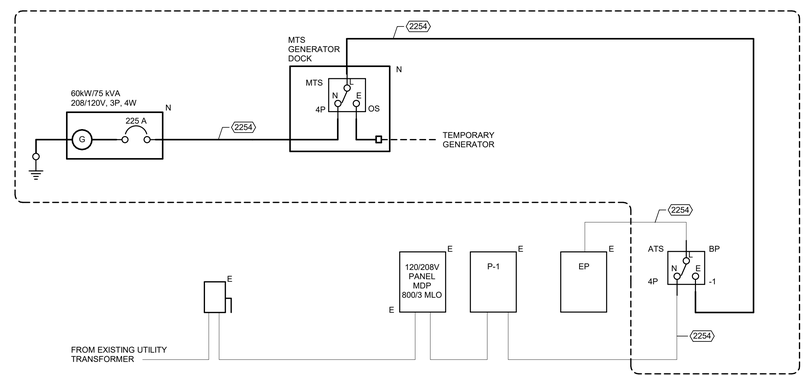
BRANCH CIRCUIT WIRING LEGEND

NOTES:
1. ALL CONDUCTOR SIZES ARE FOR COPPER CONDUCTORS NEC (2020); 75 DEGREE C.
2. CONDUIT SIZES ARE FOR COPPER CONDUCTORS WITH THHN/THWN INSULATION IN RMC.
3. CONDUIT AND CABLE SIZES SHALL BE PER TABLE BELOW UNLESS NOTED OTHERWISE ON THE FLOOR PLANS AND DRAWINGS.
4. SEE SPECIFICATIONS FOR ACCEPTABLE CONDUCTOR TYPES.

CIRCUIT SYMBOL	CONDUCTORS	CIRCUIT BREAKER
120 & 277V 1PH, 2W CKTS		
201	2#12 & 1#12G - 3/4"C	20/1
301	2#10 & 1#10G - 3/4"C	30/1
401	2#8 & 1#10G - 3/4"C	40/1
501	2#8 & 1#10G - 3/4"C	50/1
601	2#6 & 1#10G - 3/4"C	60/1
208 & 480V 1PH, 2W CKTS		
202	2#12 & 1#12G - 3/4"C	20/2
302	2#10 & 1#10G - 3/4"C	30/2
402	2#8 & 1#10G - 3/4"C	40/2
502	2#8 & 1#10G - 3/4"C	50/2
602	2#6 & 1#10G - 3/4"C	60/2
208 & 480V 3PH, 3W CKTS		
203	3#12 & 1#12G - 3/4"C	20/3
303	3#10 & 1#10G - 3/4"C	30/3
403	3#8 & 1#10G - 3/4"C	40/3
503	3#8 & 1#10G - 3/4"C	50/3
603	3#6 & 1#10G - 3/4"C	60/3

TYPICAL PANELBOARD NOTES

1. PANEL FACE PLATES SHALL BE ATTACHED TO BACK BOX WITH FULL-LENGTH PIANO HINGE AND PROVIDED WITH LOCKING DOOR IN DOOR.
2. ALL CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE AND HACR RATED.
3. NEW CIRCUIT BREAKERS TO BE INSTALLED IN EXISTING PANELBOARDS SHALL MATCH EXISTING PANELBOARD IN ALL RESPECTS INCLUDING SHORT CIRCUIT RATING (kAIC).



1 E700 ELECTRICAL POWER RISER DIAGRAM
NTS

100%CD

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Key Plan:

Owner:
City of Worcester

Project Name:
Worcester-MA - Gen Repl

Worcester, MA.

North Arrow

Stamp:
COMMONWEALTH OF MASSACHUSETTS
MICHAEL Y. PANG
ELECTRICAL
No. 48457
03/28/2025

Rev.	Description	Date

Scale Bar:

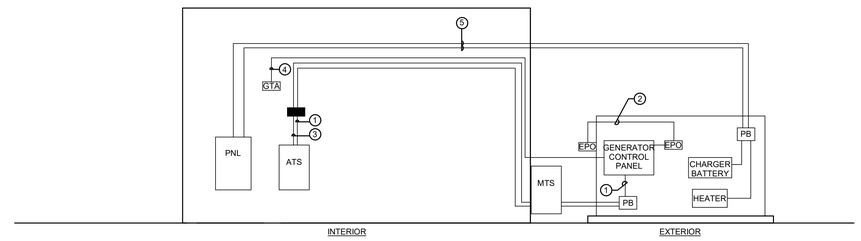
Drawing Title:
ELECTRICAL SCHEDULES AND RISER DIAGRAM

Date	03/28/2025
Scale	NTS
Drawn By	HK
Checked By	MP
Project Number	210538.12

Drawing No.
E700

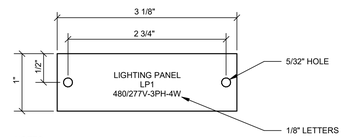
DETAIL NOTES:

1. POWER FEEDER - SEE RISER FOR RATING.
2. EPO CIRCUIT (2)#12AWG, 1"C.
3. ENGINE START CIRCUIT (2)#12AWG, 3/4"C.
4. GENERATOR ANNUNCIATOR WIRING, 1"C
5. BRANCH CIRCUIT WIRING, 3/4"C



1 GENERATOR AND EMERGENCY POWER SYSTEM WIRING DETAIL

SCALE: NTS



NOTES:

1. NAMEPLATE TO BE CONSTRUCTED OF 1/16" THICK WHITE SURFACE WITH LETTER ENGRAVED INTO BLACK LAMINATIONS.
2. ALL NAMEPLATES SHALL BE SECURED BY MACHINE SCREWS.
3. NO NAMEPLATES SHALL BE PASTED ON.

2 TYPICAL NAMEPLATE DETAIL

SCALE: NTS

100%CD

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Worcester-MA - Gen Repl

Worcester, MA.

North Arrow

Stamp:
COMMONWEALTH OF MASSACHUSETTS
MICHAEL Y. PANG
ELECTRICAL
NO. 48483
PROFESSIONAL ENGINEER
03/28/2025

Rev.	Description	Date

Scale Bar:

Drawing Title:
ELECTRICAL DETAILS

Date	03/28/2025
Scale	NTS
Drawn By	HK
Checked By	MP
Project Number	210538.12

Drawing No.
E900

GENERAL PIPING LEGEND

	PIPE OFF BOTTOM
	PIPE OFF TOP
	RUN-OUT OFF TOP
	RUN-OUT OFF BOTTOM
	PIPE UP
	PIPE DOWN
	DIRECTION OF FLOW
	PIPE BREAK
	PIPE CAP
C.T.E.	CONNECT TO EXISTING

WATER, DRAINAGE & GAS PIPING LEGEND

G	G	GAS
	(E)	EXISTING PIPING TO REMAIN
	(X)	PIPING TO BE REMOVED

VALVE LEGEND

	BV	BALL VALVE
	PG	PRESSURE GAUGE

DEMOLITION / RELOCATION LEGEND

E	EXISTING PLUMBING EQUIPMENT, FIXTURE AND/OR SYSTEM TO REMAIN
X	EXISTING PLUMBING EQUIPMENT, FIXTURE AND/OR SYSTEM TO BE SELECTIVELY DEMOLISHED
XT	EXISTING PLUMBING EQUIPMENT AND/OR FIXTURE TO BE REMOVEDAND TURNED OVER TO OWNER FOR RE-USE
XR	EXISTING PLUMBING EQUIPMENT AND/OR FIXTURE TO BE REMOVED, STORED AND RE-LOCATED.
XL	EXISTING PLUMBING EQUIPMENT AND/OR FIXTURE INDICATED IN NEW LOCATION

DEMOLITION / RELOCATION NOTES

PHASE LABELS SHOWN ABOVE ARE APPLIED IN SELECT AREAS AND MAY NOT ALWAYS BE PRESENT. REFER TO LINETYPE AND LINEWEIGHT TO DETERMINE EXISTING CONDITIONS AND DEMOLISHED EQUIPMENT.

DRAWING LIST

SHEET NUMBER	SHEET NAME
P000	PLUMBING LEGEND, NOTES AND ABBREVIATIONS
P101	PLUMBING GAS DEMOLITION PLAN

ABBREVIATIONS

ARCH	ARCHITECT
BLDG	BUILDING
CFH	CUBIC FEET PER HOUR
CONC	CONCRETE
CONT	CONTINUATION
CONTR	CONTRACTOR
CTE	CONNECT TO EXISTING
DIA	DIAMETER
DN	DOWN
EA.	EACH
ELEV	ELEVATION
E.T.R.	EXISTING TO REMAIN
EX.	EXISTING
FT	FEET
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
ID	INSIDE DIAMETER
INV.	INVERT
IN	INCHES
MECH	MECHANICAL
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PC	PLUMBING CONTRACTOR
PLBG	PLUMBING
PSI	POUNDS PER SQUARE INCH
SF	SQUARE FEET
SPEC	SPECIFICATION
TYP	TYPICAL

DRAWING NOTES

ACCU-1	EQUIPMENT TAG
1	REVISION NOTE
1	DEMOLITION WORK NOTE
1	NEW WORK NOTE
	CONNECT TO EXISTING
	CAP EXISTING
	LIMIT OF DEMOLITION
	ELECTRICAL AREA - THE AREA INDICATED IS AN ELECTRICAL ZONE. DUCTWORK, PIPING, AND SYSTEMS SHALL NOT RUN THROUGH THIS ZONE. EXCEPTION:PIPES, DUCTS, AND EQUIPMENT DEDICATED TO SERVE THE ZONE ARE ALLOWED. COORDINATE WITH ELECTRICAL CONTRACTOR AND COMPLY WITH ALL CODE CLEARANCE REQUIREMENTS.

DEMOLITION GENERAL NOTES

1. CONTRACTOR SHALL VISIT SITE AND IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK OF THIS SECTION. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY CONSTRUED BY EXPERIENCED OBSERVERS.
2. PRIOR TO COMMENCING WORK OF THIS SECTION, EXAMINE SITE AND CONDITIONS UNDER WHICH WORK WILL BE PERFORMED. DETERMINE EXACT LOCATIONS OF EXISTING EQUIPMENT, PIPING AND CONTROLS. REPORT TO OWNER ANY CONDITIONS THAT MIGHT ADVERSELY AFFECT WORK. COMMENCEMENT OF WORK SHALL BE CONSTRUED AS COMPLETE ACCEPTANCE OF EXISTING CONDITIONS AND PREPARATORY WORK.
3. ABANDONING OF FIXTURES, CARRIERS, PIPING OR EQUIPMENT IN PLACE SHALL NOT BE ALLOWED. COMPLETE REMOVAL REQUIRED UNLESS NOTED OTHERWISE.
4. PIPING TO BE REMOVED: REMOVE PORTION OF PIPING INDICATED TO BE REMOVED, PROVIDE FULL PORT BALL VALVE AND CAP REMAINING PIPING WITH SAME OR COMPATIBLE PIPING MATERIAL.
5. FIXTURES TO BE REMOVED: REMOVE FIXTURES AND ALL ASSOCIATED ACCESSORIES INCLUDING BUT NOT LIMITED TOO. CARRIERS, SUPPORTS, PIPING, FLANGES, OTHER MOUNTING ACCESSORIES AND ETC.
6. EQUIPMENT TO BE REMOVED: DISCONNECT AND REMOVE EQUIPMENT. ALL UNUSED SERVICES CONNECTED TO DEMOLISHED EQUIPMENT SHALL BE REMOVED BACK TO UNUSED PORTION AND SERVICES CAPPED.
7. EQUIPMENT TO BE REMOVED AND SALVAGED: DISCONNECT AND CAP SERVICES, REMOVE EQUIPMENT AND DELIVER TO OWNER. ALL UNUSED PORTIONS SHALL BE DEMOLISHED AS INDICATED WITHIN THESE DOCUMENTS.
8. COMPLY WITH ALL STATE AND LOCAL CODES AS TO REMOVAL AND DISPOSAL OF EQUIPMENT REMOVED FROM THE SITE.
9. COMPLY WITH GOVERNING EPA NOTIFICATION REGULATIONS BEFORE BEGINNING SELECTIVE DEMOLITION.
10. REMOVE PREVIOUSLY ABANDONED WORK IN THE WAY OF EXISTING CONSTRUCTION, OR AS NOTED.
11. COMPLY WITH HAULING AND DISPOSAL REGULATIONS OF AUTHORITIES HAVING JURISDICTION.
12. COMPLY WITH ANSI A10.6 (SAFETY REQUIREMENTS FOR DEMOLITION OPERATIONS) AND NFPA 241 (STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION AND DEMOLITION OPERATIONS)
13. PERMITS: GIVE ALL REQUIRED NOTICES, FILE ALL REQUIRED PLANS AND SPECIFICATIONS RELATING TO THE WORK OF THIS SECTION WITH THE PROPER AUTHORITIES AND PAY FOR ANY REQUIRED PERMITS.
14. ALL EQUIPMENT AND SYSTEMS TO BE REMOVED OR DEMOLISHED UNDER THIS SECTION AND NOT DESIRED BY OWNER SHALL BECOME THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL REMOVE ALL SUCH EQUIPMENT FROM THE SITE PROMPTLY AFTER DETACHMENT FROM BUILDING STRUCTURE.
15. STORAGE OR SALE OF REMOVED ITEMS OR MATERIALS ON-SITE IS NOT PERMITTED.
16. IT IS UNKNOWN WHETHER HAZARDOUS MATERIALS WILL BE ENCOUNTERED IN THE WORK. IF MATERIALS SUSPECTED OF CONTAINING HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB; IMMEDIATELY NOTIFY ARCHITECT AND OWNER.
17. EXISTING PIPING SHOWN ON DRAWINGS DOES NOT INDICATE FULL EXTENT OF PIPING DEMOLITION. FIELD VERIFICATIONS REQUIRED.
18. FIXTURES EXISTING TO REMAIN: FIXTURES SHALL BE PROTECTED DURING DEMOLITION. FIXTURES DAMAGED DURING DEMOLITION SHALL BE REPAIRED TO LIKE NEW WORKING CONDITION OR REPLACED WITH SAME FIXTURE. WHERE SAME FIXTURE IS NO LONGER AVAILABLE AN APPROVED EQUAL BY OWNER AND ENGINEER SHALL BE USED. ALL WORK SHALL BE PERFORMED AT NO COST TO OWNER.

GENERAL NOTES

1. PIPE ROUTING IS SHOWN DIAGRAMMATICALLY ON PLUMBING DRAWINGS AND SHALL BE ADJUSTED FOR ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL CLEARANCES AND LIMITATIONS AND FOR EQUIPMENT SELECTION.
2. FURNISH AND INSTALL ALL ELEMENTS REQUIRED TO COMPLETE INTENDED PIPING SYSTEMS WHETHER OR NOT THESE ELEMENTS ARE SPECIFICALLY SHOWN ON DRAWINGS OR CALLED FOR IN SPECIFICATIONS.
3. CONSULT ALL DRAWINGS, NOTES, ARCHITECTURAL DETAILS AND ALL CONDITIONS THAT MAY AFFECT THE WORK AND CARE FOR SAME, WHILE EXECUTING THE WORK UNDER THIS SECTION. COOPERATE AND COORDINATE WITH THE ARCHITECT, ALL OTHER TRADES, BLDG. MANAGEMENT, AND THE OWNER.
4. ALL WORK SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES AND REGULATIONS.
5. IN EVENT OF CONFLICT BETWEEN OR AMONG SPECIFIED REQUIREMENTS AND PERTINENT CODES OR REGULATIONS, MORE STRINGENT REQUIREMENTS SHALL GOVERN.
6. TAKE ALL MEASURES REQUIRED TO PROTECT OWNER'S PROPERTY AND EQUIPMENT DURING COURSE OF WORK. SHOULD DAMAGE TO OWNER'S PROPERTY OR EQUIPMENT OCCUR, REPAIR DAMAGE PROMPTLY AT NO COST TO OWNER.
7. LOCATIONS, PLUMBING MOUNTING HEIGHTS, AND DETAILS SHOWN ON ARCHITECTURAL DRAWINGS TAKE PRECEDENCE OVER SAME SHOWN ON PLUMBING DRAWINGS AND DESCRIBED IN SECTIONS OF THE SPECIFICATIONS. WHEN ARCHITECTURAL DRAWINGS DO NOT SHOW PRECISE LOCATIONS OF DEVICES OR EQUIPMENT, LOCATE AS DIRECTED BY THE ARCHITECT.

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Key Plan:

Owner:
City of Worcester

Project Name:
Worcester-MA - Gen Repl

Worcester, MA.

North Arrow

Stamp:
COMMONWEALTH OF MASSACHUSETTS
TERENCE R. BOLAND
MECHANICAL
No. 50514
PROFESSIONAL ENGINEER
03/28/2025

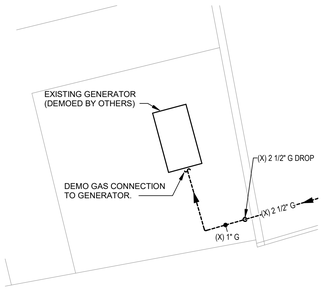
Rev.	Description	Date

Scale Bar:

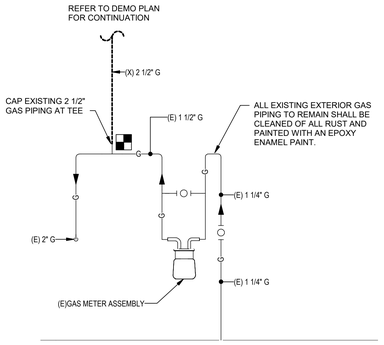
Drawing Title:
PLUMBING LEGEND, NOTES AND ABBREVIATIONS

Date	03/28/2025
Scale	NTS
Drawn By	LSM
Checked By	RDB
Project Number	210538.12

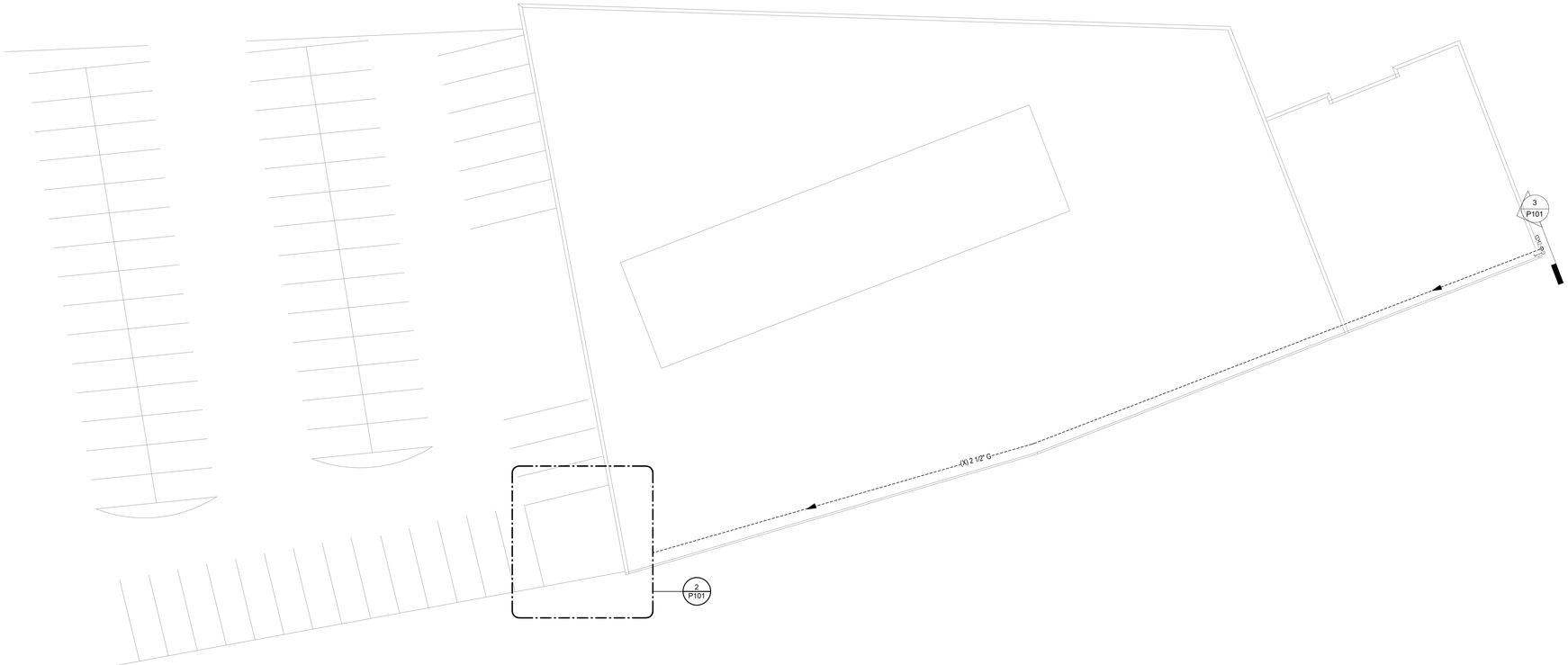
Drawing No.
P000



2 P101 GENERATOR CONNNECTION
1/8" = 1'-0"
0 4' 8' 16'



3 P101 GAS SERVICE ENTRANCE
NTS



1 P101 Plumbing Demo Plan-01
1/16" = 1'-0"
0 4' 8' 16'

100%CD

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Worcester-MA - Gen Repl

Worcester, MA.

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Stamp:
COMMONWEALTH OF MASSACHUSETTS
TERENCE R. BOLAND
MECHANICAL
No. 50514
FINAL DRAWING
03/28/2025

Rev.	Description	Date

Scale Bar:

Drawing Title:
PLUMBING GAS
DEMOLITION PLAN

Date	03/28/2025
Scale	NTS
Drawn By	LSM
Checked By	RDB
Project Number	210538.12

Drawing No.
P101