

# ELECTRICAL SYMBOLS AND ABBREVIATIONS

THIS IS A COMPREHENSIVE SYMBOL AND ABBREVIATION LIST. NOT ALL SYMBOLS ARE APPLICABLE TO THESE DRAWINGS.

<p><b>S</b> SINGLE POLE SWITCH, 3=3 WAY, 4=4 WAY, P=PILOT R=RELAY, K=KEYED, I=ILLUMINATED, D=DIMMER M=MOTION SENSOR SWITCH</p> <p><b>⊕</b> DUPLEX RECEPTACLE C=CEILING MOUNTED</p> <p><b>⊕</b> DUPLEX RECEPTACLE MOUNTED AT 44" TO BOTTOM</p> <p><b>⊕</b> POWER RECEPTACLE 240V 30=30AMP 60=60AMP R = 50A RANGE OUTLET D = 30A DRYER OUTLET</p> <p><b>⊕</b> DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER</p> <p><b>IG</b> ISOLATED GROUND RECEPTACLE</p> <p><b>SP</b> SURGE PROTECTED RECEPTACLE</p> <p><b>⊕</b> UPS SYSTEM RECEPTACLE</p> <p><b>⊕</b> DOUBLE DUPLEX RECEPTACLE (RECEPTACLES MOUNTED SIDE BY SIDE)</p> <p><b>⊕</b> BLANK OUTLET FOR FUTURE DEVICES 4" DEEP BOX, SINGLE GANG RING, BLANKPLATE, 1". STUBBED INTO ACCESSIBLE CEILING</p> <p><b>⊕</b> BLANK OUTLET MTD @ 44" FOR FUTURE DEVICES 4" BOX, SINGLE GANG RING, BLANKPLATE, 1". STUBBED INTO ACCESSIBLE CEILING</p> <p><b>---</b> WIREMOLD PLUG STRIP. SEE DETAILS</p> <p><b>⊕</b> DUPLEX RECEPTACLE IN FLOOR, FLUSH MTD A,B,C = TYPE PER SPECIFICATION.</p> <p><b>⊕</b> EQUIPMENT CONNECTION</p> <p><b>X</b> DATA (SHADED) AND VOICE (UNSHADED) OUTLET. SEE DETAILS. X INDICATES NUMBER OF DROPS FOR PHONE AND DATA. PROVIDE 4" SQUARE DEEP BOX, 1-GANG RING, 1" CONDUIT STUBBED INTO ACCESSIBLE CEILING. NO "X" INDICATES SINGLE DROP.</p> <p><b>X</b> TELEPHONE OUTLET. SEE DETAIL. X INDICATES NUMBER OF DROPS PER OUTLET. NO X INDICATES 1 DROP. PROVIDE 4" SQUARE DEEP BOX, 1-GANG RING, 1" CONDUIT STUBBED INTO ACCESSIBLE CEILING.</p> <p><b>W</b> WALL TELEPHONE MOUNTED AT 48" AFF. PROVIDE 4" SQUARE DEEP BOX, 1-GANG RING, 1" CONDUIT STUBBED INTO ACCESSIBLE CEILING.</p> <p><b>X</b> DATA OUTLET ONLY. SEE DETAIL. X INDICATES NUMBER OF PHONE DROPS PER OUTLET. NO X INDICATES 1 DROP. PROVIDE 4" SQUARE DEEP BOX, 1-GANG RING, 1" CONDUIT STUBBED INTO ACCESSIBLE CEILING.</p> <p><b>J</b> J-BOX</p> <p><b>⊕</b> HEAVY DUTY DISCONNECT F=FUSIBLE WP=WEATHERPROOF FURNISHED BY E.C.</p> <p><b>⊕</b> NON-COMBINATION STARTER</p> <p><b>⊕</b> NEW SURFACE MOUNTED PANEL. SEE PLANS.</p> <p><b>⊕</b> NEW FLUSH MOUNTED PANEL. SEE PLANS.</p> <p><b>⊕</b> EXISTING SURFACE MOUNTED PANEL. SEE PLANS.</p> <p><b>⊕</b> EXISTING FLUSH MOUNTED PANEL. SEE PLANS.</p> <p><b>XXX</b> TYPE <b>XXXX</b> EQUIPMENT LOCATION <b>DESIGNATION</b></p> <p><b>XX</b> REFERS TO DETAIL</p> <p><b>XXX</b> SHEET NO. WHERE DETAIL IS LOCATED</p>	<p><b>⊕</b> FIRE ALARM AUDIO/VISUAL NOTIFICATION APPLIANCE, X = CD LEVEL</p> <p><b>⊕</b> REDUCED db ROOM SOUNDER AUDIO/VISUAL NOTIFICATION APPLIANCE</p> <p><b>⊕</b> FIRE ALARM INDICATOR FOR SMOKE DETECTORS</p> <p><b>⊕</b> ADDRESSABLE FIRE ALARM INPUT/OUTPUT</p> <p><b>⊕</b> FIRE ALARM STATION</p> <p><b>⊕</b> XENON STROBE, X = CD LEVEL AUDIO/VISUAL</p> <p><b>⊕</b> CEILING MOUNTED (XX = CANDELA RATING)</p> <p><b>⊕</b> XENON STROBE, CEILING MOUNTED, X = CD LEVEL</p> <p><b>⊕</b> SPRINKLER TAMPER SWITCH SPRINKLER</p> <p><b>⊕</b> FLOW SWITCH</p> <p><b>⊕</b> KEYPAD</p> <p><b>⊕</b> CARD READER</p> <p><b>⊕</b> DOOR SWITCH</p> <p><b>⊕</b> ELECTRIC STRIKE</p> <p><b>⊕</b> AREA OF REFUGE STATION</p> <p><b>⊕</b> AREA OF REFUGE MASTER</p> <p><b>⊕</b> AREA OF RESCUE ILLUMINATED SIGN</p> <p><b>⊕</b> FIRE ALARM CONTROL PANEL</p> <p><b>⊕</b> FIRE ALARM ANNUNCIATOR PANEL</p> <p><b>⊕</b> HEAT DETECTOR</p> <p><b>⊕</b> SMOKE DETECTOR</p> <p><b>⊕</b> ELEVATOR SMOKE DETECTOR</p> <p><b>⊕</b> PHOTO CONTROL</p> <p><b>⊕</b> CEILING SPEAKER</p> <p><b>⊕</b> WALL MOUNTED CALL-IN SWITCH BOX OR HANDSET</p> <p><b>⊕</b> WALL MOUNTED SPEAKER BOX</p> <p><b>⊕</b> MOTION DETECTOR</p> <p><b>⊕</b> CEILING MOUNTED FLUSH OR SURFACE</p> <p><b>⊕</b> WALL MOUNTED, FLUSH OR SURFACE</p> <p><b>⊕</b> FLUORESCENT FIXTURE</p> <p><b>⊕</b> EMERGENCY LIGHT</p> <p><b>⊕</b> RECESSED EMERGENCY LIGHT</p> <p><b>⊕</b> EXIT LIGHT</p> <p><b>⊕</b> REFERS TO NOTE NUMBER</p> <p><b>⊕</b> REFERS TO DETAIL NUMBER</p> <p><b>⊕</b> CIRCUIT HOMERUN TO 20A/1P BREAKER UNLESS SHOWN OTHERWISE ON DRAWINGS</p> <p><b>⊕</b> INDICATES CONNECTED TO SAME CIRCUIT BUT CONTROLLED SEPARATELY</p> <p><b>⊕</b> MOTOR OUTLET TERMINAL, ON ROOF MOUNTED UNITS PROVIDE WEATHER PROOF DISCONNECTS. X = HORSE POWER OR MOTOR NUMBER IF SCHEDULE IS PROVIDED.</p> <p><b>⊕</b> COMBINATION STARTER</p> <p><b>⊕</b> MANUAL STARTER</p> <p><b>⊕</b> ULTRASONIC LIGHTING CONTROL</p> <p><b>⊕</b> OCCUPANCY SENSOR</p> <p><b>⊕</b> CONDUIT STUB THROUGH WALL, 1" ABOVE CEILING BUSHED EACH END</p> <p><b>⊕</b> PHOTOVOLTAIC 245 w COLLECTOR SOLAR WORLD SH245 MONO 66"x39-1/2" 48.5 LBS</p>	<p><b>AFF</b> ABOVE FINISH FLOOR</p> <p><b>AFG</b> ABOVE FINISH GRADE</p> <p><b>C</b> CONDUIT</p> <p><b>CCU</b> COOLING CONDENSER UNIT</p> <p><b>CKT</b> CIRCUIT</p> <p><b>CT</b> CURRENT TRANSFORMER</p> <p><b>CON</b> CONTACTOR</p> <p><b>CP</b> CONTROL PANEL</p> <p><b>DIS</b> DISCONNECT</p> <p><b>DM</b> DEMARC</p> <p><b>DS</b> DOOR SWITCH</p> <p><b>EBB</b> ELECTRICAL BASE BOARD</p> <p><b>EC</b> ELECTRICAL CONTRACTOR</p> <p><b>ECB</b> ENCLOSED CIRCUIT BREAKER</p> <p><b>ELEV</b> ELEVATION</p> <p><b>EM</b> EMERGENCY</p> <p><b>EQ</b> EQUIPMENT</p> <p><b>EUH</b> ELECTRIC UNIT HEATER</p> <p><b>EW</b> ELECTRIC WATER COOLER</p> <p><b>EWH</b> ELECTRIC WALL HEATER</p> <p><b>FAAP</b> FIRE ALARM ANNUNCIATOR PANEL</p> <p><b>FACP</b> FIRE ALARM CONTROL PANEL</p> <p><b>FBO</b> FURNISHED BY OTHERS</p> <p><b>GUH</b> GAS UNIT HEATER</p> <p><b>GC</b> GENERAL CONTRACTOR</p> <p><b>GFI</b> GROUND FAULT INTERRUPTER</p> <p><b>GND</b> GROUND</p> <p><b>HVAC</b> HEATING, VENTILATING AND AIR CONDITIONING</p> <p><b>INC</b> INCANDESCENT</p> <p><b>LC</b> LIGHTING CONTROL</p> <p><b>MAU</b> MAKEUP AIR UNIT</p> <p><b>MDF</b> MAIN DISTRIBUTION FRAME</p> <p><b>MOD</b> MOTOR OPERATED DAMPER</p> <p><b>MTD</b> MOUNTED</p> <p><b>NL</b> NIGHT LIGHT</p> <p><b>NIC</b> NOT IN CONTRACT</p> <p><b>NTS</b> NOT TO SCALE</p> <p><b>OHD</b> OVERHEAD DOOR</p> <p><b>OC</b> ON CENTER</p> <p><b>PC</b> PHOTO CONTROL</p> <p><b>PNL</b> PANELBOARD</p> <p><b>RCP</b> RELAY CONTROL PANEL</p> <p><b>REF</b> REFRIGERATOR</p> <p><b>RTU</b> ROOF TOP UNIT</p> <p><b>SS</b> STAINLESS STEEL</p> <p><b>TC</b> TELECOMMUNICATION CLOSET</p> <p><b>TRN</b> TRANSFORMER</p> <p><b>TRS</b> TRANSFER SWITCH</p> <p><b>TTB</b> TELEPHONE TERMINAL BOARD</p> <p><b>TVSS</b> TRANSIENT VOLTAGE SURGE SUPPRESSOR</p> <p><b>UH</b> UNIT HEATER</p> <p><b>VFD</b> VARIABLE FREQUENCY DRIVE</p> <p><b>WE</b> WALL EXHAUST</p> <p><b>WH</b> WATER HEATER</p> <p><b>WP</b> WEATHER PROOF</p>
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## PROJECT TEAM

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E100	ROOF PV LAYOUT PLAN
E101	PARTIAL FIRST & SECOND FLOOR PLAN

CITY OF MILWAUKEE PROJECT NO. BU11010601

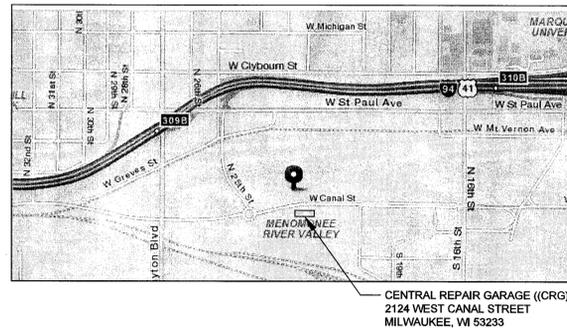
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*Vern ...* 7-8-2011  
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*Greg ...*  
 COMMISSIONER OF PUBLIC WORKS

## VICINITY MAP



Department of Public Works

Project  
 20 KW PHOTOVOLTAIC SYSTEM FOR CENTRAL REPAIR GARAGE

CITY OF MILWAUKEE DEPARTMENT OF PUBLIC WORKS

Muermann Engineering  
 Project Number  
 2011001



Issued for  
 Construction Documents

REVISIONS

#	DESCRIPTION	DATE

Drawn by: EJM  
 Checked by: FM  
 Date: 07-05-11

Sheet Title  
**SHEET INDEX**

Sheet Number

**G000**