

LEGEND

LP-1,3 → HOMERUN TO PNLBRD – ARROWS INDICATE NUMBER OF CIRCUITS. CROSS LINES INDICATE NUMBER OF CONDUCTORS OTHER THEN TWO.

↑ CIRCUIT NUMBER(S)

— PANEL DESIGNATION

— WIRING CONCEALED IN WALL OR CEILING

□ 1' x 4' FLUORESCENT FIXTURE

□ 1' x 8' FLUORESCENT FIXTURE

S SINGLE POLE SWITCH – MTD CL UP 4'-0"

⊕ DOUBLE POLE SWITCH – MTD CL UP 4'-0"

S₃ THREE-WAY SWITCH – MTD CL UP 4'-0"

S_v LOW VOLTAGE SWITCHES – MTD CL UP 4'-0". SUB_NUMBER INDICATES RELAY NUMBER CONTROLLED. M=MASTER ON/OFF.

S₄ FOUR-WAY SWITCH – MTD CL UP 4'-0"

S_p SWITCH AND PILOT LAMP – MTD CL UP 4'-0"

S_d DIMMER SWITCH – MTD CL UP 4'-0"

S_c SUBLETTER INDICATES SWITCH CONTROL

☐ MUSHROOM PANIC SWITCH – MTD UP 4'-6" OR AS INDICATED

⊕ DUPLEX CONVENIENCE RECEPTACLE – MOUNTED – CL UP 24" OR AS NOTED

⊕ DUPLEX CONVENIENCE RECEPTACLE – MOUNTED CL UP 48" OR AS NOTED

⊕ GFCI DUPLEX CONVENIENCE RECEPTACLE – MOUNTED CL UP 48" OR AS NOTED

⊕ DOUBLE DUPLEX RECEPTACLE IN TWO GANG WALL BOX – CL UP 24" OR AS NOTED

⊕ COMM OUTLET – MOUNTED CL UP SAME AS ASSOCIATED DUPLEX RECEPTACLE

⊕ PLUGMOLD WITH RECEPTACLES – MOUNTED 6" ABOVE COUNTER OR AS INDICATED

⊕ SPECIAL OUTLET AS INDICATED – MOUNTED AS INDICATED

(M) ELECTRICAL MOTOR

⊕ MOTOR CONTROL EQUIPMENT

⊕ DISCONNECT SWITCH – FUSED WHEN NOTED. SIZE AS REQUIRED OR AS INDICATED

⊕ FUSED DISCONNECT SWITCH – SIZE FUSES AS RECOMMENDED BY MANUFACTURER

⊕ JUNCTION BOX – SIZE AS REQUIRED OR AS INDICATED

⊕ TELEPHONE (TEL) OR DATA (IDF) BACKBOARD – SIZE AS INDICATED

⊕ LIGHTING/POWER PANELBOARD

⊕ LIGHTING/POWER PANELBOARD 480V

⊕ EXISTING PANELBOARD

⊕ CIRCUIT BREAKER IN NEMA 1 ENCLOSURE.

⊕ POWER COMPANY METER

⊕ DRY TYPE TRANSFORMER

⊕ FIRE ALARM DEVICES -----

⊕ MASTER FIRE BOX – COORDINATE WITH LOCAL FIRE DEPARTMENT FOR REQUIREMENTS

⊕ FIRE ALARM CONTROL PANEL

⊕ ANNUNCIATOR PANEL

⊕ SMOKE DETECTOR – MOUNTED ON CEILING

⊕ SMOKE DETECTOR WITH INTERNAL HORN – MOUNTED ON CEILING EXCEPT AS NOTED

⊕ DUCT DETECTOR WITH SAMPLING TUBE

⊕ HEAT DETECTOR – MOUNTED ON CEILING

⊕ FIRE ALARM HORN/LIGHT UNIT. CANDLE POWER (CD) PER NFPA 72 AND AS NOTED – MOUNTED BOTTOM OF STROBE UP 80" ON WALL.

⊕ FIRE ALARM STROBE LIGHT UNIT. CANDLE POWER (CD) PER NFPA 72 AND AS NOTED – MOUNTED BOTTOM OF STROBE UP 80" ON WALL. C = CEILING MOUNTED.

⊕ FIRE ALARM MINI-HORN/LIGHT UNIT. CANDLE POWER (CD) PER NFPA 72 AND AS NOTED – MOUNTED BOTTOM OF STROBE UP 80" ON WALL.

⊕ FIRE ALARM MANUAL PULL STATION – MOUNTED CL UP 4'-0" ON WALL.

⊕ SPRINKLER FLOW SWITCH

⊕ SPRINKLER PRESSURE SWITCH

⊕ SPRINKLER TAMPER SWITCH

⊕ ADDRESSABLE INTERFACE DEVICE

⊕ FCPS FIELD CHARGING POWER SUPPLY FCPS

⊕ EMERGENCY LIGHTING DEVICES -----

⊕ EXIT SIGN WITH ARROWS AS INDICATED – CEILING MOUNTED, EXCEPT AS NOTED

⊕ EXIT SIGN WITH ARROWS AS INDICATED – WALL MOUNTED TIGHT TO CEILING, EXCEPT AS NOTED

⊕ EMERGENCY LIGHTING BATTERY UNIT – WALL MOUNTED UP 7'-6". NUMERAL INDICATES BATTERY ID NUMBER. SEE SPEC FOR DC WIRE SIZES.

⊕ EMERGENCY LIGHTING REMOTE HEAD WITH NUMBER OF HEADS AS INDICATED – MOUNTED UP 7'-6". NUMERAL INDICATES BATTERY UNIT CONNECTED TO.

⊕ RECESSED EMERGENCY LIGHTING REMOTE HEAD. NUMERAL INDICATES BATTERY UNIT CONNECTED TO.

⊕ MISCELLANEOUS -----

⊕ EXTERIOR PHOTOELECTRIC CELL

⊕ CEILING MOUNTED LIGHTING OCCUPANCY SENSOR. W = WALL MTD UP AS NOTED. CONTROL FROM PNL V/LPA

⊕ TIME CLOCK

⊕ CONTROL PANEL

⊕ PROVISIONS FOR DOOR SWITCH

⊕ PROVISIONS FOR DOOR LOCK

⊕ PUSH BUTTON – MTD UP 4'-0" OR AS INDICATED

⊕ PROVISIONS FOR ELECTRIC DOOR HOLDER

⊕ PROVISIONS FOR PROX CARD READER

⊕ PROVISIONS FOR INTRUSION MOTION DETECTOR – 4" OCT BOX BOTTOM OF JOIST, EXCEPT AS NOTED.

⊕ PROVISIONS FOR ACCESS KEY PAD – MOUNTED UP 4'-6" ON WALL

⊕ PROVISIONS FOR POWER OVER INTERNET INJECTOR – 4" SQ BOX WITH 120V.

⊕ TELEVISION COAXIAL OUTLET – MOUNTED UP SAME AS ASSOCIATED RECEPTACLE

⊕ SPEAKER OUTLET – MOUNTED 7'-6" ON WALL

⊕ RELAY OR CONTACTOR – SIZE AS REQUIRED OR AS INDICATED

⊕ DASHED ITEMS ARE EXISTING

⊕ WEATHER PROOF

⊕ KEYNOTE TAG

⊕ #1# EQUIPMENT LABEL – SEE EQUIPMENT SCHEDULE FOR WIRING REQUIREMENTS. VERIFY EXACT LOCATION WITH ASSOCIATED PLAN.

LIGHTING FIXTURE SCHEDULE

ALL FIXTURES SHALL BE FURNISHED COMPLETE WITH ALL HARDWARE
LAMPS, HANGERS, FITTINGS, ETC. FOR A COMPLETE AND PROPER INSTALLATION

TYPE	MANUFACTURER	CATALOG NO.	MTG.	VOLT	LAMPS			REMARKS/BALLAST INFORMATION
					NO.	WATT	TYPE	
A	SURFACE MOUNTED LOW PROFILE WRAP	LB 2 32 MVOLT GEB10PS	S	277	2	64	T8	MOUNT TO UNISTRUT EVEN WITH BOTTOM OF BEAM
B	SURFACE MOUNTED VAPOR TIGHT	VSL 3 32 277 GEB10PS	S	277	3	96	T8	
C	WALL MOUNTED VAPOR TIGHT	VSL 3 32 277 GEB10PS	W	277	3	96	T8	
D	2"x4" RECESSED FIXTURE	ZWRT G 2 32 A12125V MVOLT GEB10PS	R	277	2	32	T8	PROVIDE WITH INVERTED PRISM LENS
E	LED WALL PACK	TWH LED 10C 1000 50K T3M MVOLT DDBXD	W	MVOLT	LED	63	LED	

DIVISION 16 – ELECTRICAL

PART 1 – GENERAL

- 1.1 SECTION INCLUDES
 - A. BASIC ELECTRICAL REQUIREMENTS
 - B. INTENT IS PROVIDE AND INSTALL ALL MATERIALS & LABOR TO IMPLEMENT THE DESIGN AS INTENDED FOR COMPLETE WORKING ELECTRICAL SYSTEMS, AS REQUIRED TO ACCOMMODATE THE NEW ADDITION & EQUIPMENT. WORK SHALL ALSO INCLUDE ALL ELECTRICAL DEMOLITION TO ALLOW FOR THE ALTERATIONS.
- 1.2 PERFORMANCE REQUIREMENTS
 - A. CONFORM TO REQUIREMENTS OF THE LATEST EDITION OF ANSI/NFPA 70 NATIONAL ELECTRICAL CODE (N.E.C.).
 - B. CONFORM TO REQUIREMENTS OF ALL LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS, PLUS LOCAL ELECTRIC UTILITY COMPANY'S RULES, AND THE FIRE UNDERWRITERS' REQUIREMENTS.
 - C. FURNISH PRODUCTS LISTED AND CLASSIFIED BY UNDERWRITERS' LABORATORIES, INC. (U.L.) AS SUITABLE FOR PURPOSE SPECIFIED AND SHOWN.
 - D. SECURE AND PAY FOR ALL PERMITS AND CERTIFICATES AS REQUIRED BY LOCAL, STATE AND FEDERAL LAWS.
 - E. REQUEST INSPECTIONS FROM AUTHORITY HAVING JURISDICTION.
 - F. CIRCUITS SHALL BE BALANCED AND LOADS AND CAPACITIES SHALL BE IN ACCORDANCE WITH N.E.C. CRITERIA AND NATIONAL BOARD OF FIRE UNDERWRITERS.
 - G. EXACT LOCATIONS OF ALL EQUIPMENT SHALL BE VERIFIED AT THE SITE, WITH THE OWNER AND ENGINEER.
 - H. THE ENTIRE ELECTRICAL SYSTEM SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED IN ACCORDANCE WITH CODE REQUIREMENTS.
- 1.3 SEQUENCING AND SCHEDULING
 - A. SCHEDULE AND COORDINATE ALL WORK WITH THE OWNER AND THE CONTRACTOR. DEMOLITION AND REMOVAL OF ELECTRICAL ITEMS ARE INCLUDED AS PART OF DIVISION 16.
 - B. ARRANGE TO EXECUTE THE WORK AT SUCH TIMES AND IN SUCH LOCATIONS AS MAY BE REQUIRED TO PROVIDE UNINTERRUPTED SERVICES FOR THE BUILDING, OR ANY OF ITS SECTIONS.
 1. SERVICES INCLUDE BUT NOT LIMITED TO: POWER, LIGHTING, FIRE ALARM, PAGING/INTERCOM, TELEPHONE, COMPUTER, AND LIFE SAFETY SYSTEMS AS REQUIRED TO MAINTAIN SAFE OCCUPANCY.
 2. IF NECESSARY, INSTALL TEMPORARY WORK TO PROVIDE FOR THIS CONDITION. AUTHORIZATION FOR INTERRUPTING SERVICES FOR ANY PORTIONS OF THE BUILDING SHALL BE OBTAINED, IN WRITING, FROM THE OWNER.
 3. COSTS FOR OVERTIME WORK AND TEMPORARY WORK SHALL BE INCLUDED.
 - C. ALL EXISTING WIRING THAT IS DISCONNECTED SHALL BE COMPLETELY REMOVED TO SOURCE. ALL EXISTING WIRING THAT IS DISTURBED BUT INTENDED TO REMAIN, SHALL BE REFEED AND RECONNECTED AS REQUIRED.
 - D. ALL ELECTRICAL ITEMS REMOVED SHALL BE RETURNED TO THE OWNER. AT THE OWNERS OPTION, CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER DISPOSAL OF REMAINING ITEMS NOT WANTED BY THE OWNER.

PART 2 – PRODUCTS

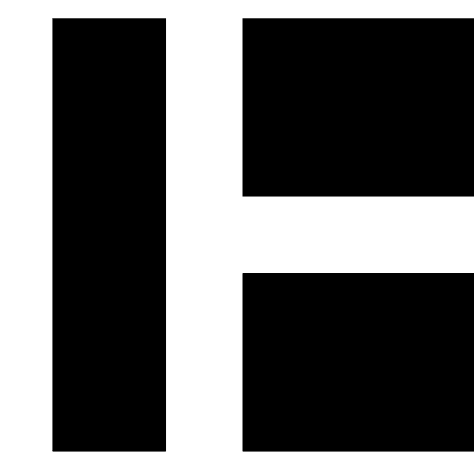
- 2.1 DEVICES
 - A. RECEPTACLES SHALL BE NEMA 5-20R. SWITCHES SHALL BE 277 VOLT RATED.
 - B. ALL DEVICES SHALL BE HEAVY DUTY COMMERCIAL GRADE.
- 2.2 WIRE AND CABLE
 - A. ALL WIRING SHALL BE STRANDED COPPER, THWN/THHN, COLOR CODED AS INDICATED BELOW, MINIMUM SIZE #12 AWG. ALL CONDUCTORS SHALL BE IN CONDUIT AND SHALL BE PROPERLY SUPPORTED.
 - B. WIRE COLOR CODE SHALL BE AS FOLLOWS:

277/480V	BROWN	BLACK
	PHASE B	ORANGE
	PHASE C	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
	GROUND	GREEN

 VERIFY COLOR CODING WITH OWNER. USE OWNER'S CODING IF NOT AS LISTED ABOVE.
 - C. DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE, HORSE POWER RATED.
- 2.3 FIRE ALARM SYSTEM
 - A. EXISTING SYSTEM IS MANUFACTURED BY NOTIFIER.
 - B. PROVIDE THE SERVICES OF A FACTORY TRAINED, LICENSED AUTHORIZED TECHNICAL REPRESENTATIVE OF THE MANUFACTURER OF THE EQUIPMENT TO SUPERVISE THE INSTALLATION AND FINAL CONNECTIONS, PLUS ADJUSTING, PROGRAMMING AND ACCEPT TESTING OF THE SYSTEM REQUIRED TO ASSURE A COMPLETE AND FULLY OPERATIVE FACILITY.
 - C. THE DRAWINGS DO NOT SHOW ALL DETAILS OF THE FIRE ALARM SYSTEM. IT SHALL BE THE RESPONSIBILITY OF THE AUTHORIZED SUPPLIER/INSTALLER TO PROVIDE A FULLY OPERATIONAL CODE COMPLIANT SYSTEM. INTENT IS TO NOT DISTURB EXISTING SYSTEM AND TO EXTEND AS REQUIRED TO PROTECT THE NEW AREAS.
 - D. RELOCATE DEVICES ONLY IF REQUIRED TO COORD WITH THE ALTERATIONS.
 - E. MODIFICATIONS SHALL CONFORM TO THE MANUFACTURER'S REQUIREMENTS AND INSTALLATION SHALL CONFORM TO APPLICABLE ADA, FM AND NFPA CODES.
 - F. ALL COMPONENTS SHALL BE OF THE SAME MANUFACTURER.
 - G. COORDINATE WITH AND OBTAIN APPROVAL FROM THE LOCAL FIRE CHIEF (AHJ), LT. COLLINS.
 - H. INCLUDE TESTING AT SUBSTANTIAL COMPLETION, AND AGAIN AT 6 MONTHS AFTER OCCUPANCY. TEST IN ACCORDANCE WITH NFPA 72 AND LOCAL FIRE DEPARTMENT REQUIREMENTS.

PART 3 – EXECUTION

- 3.1 WORKMANSHIP AND INSTALLATION
 - A. EXECUTE ALL WORK IN A NEAT MANNER ACCEPTABLE TO THE LOCAL AND STATE ELECTRICAL INSPECTOR. FOLLOW MANUFACTURER'S INSTALLATION RECOMMENDATIONS.
 - B. PERFORM ALL ELECTRICAL WORK BY LICENSED ELECTRICIANS WELL SKILLED IN THE TRADE AND SUPERVISED BY A MASTER ELECTRICIAN.
- 3.2 INSTALLATION
 - A. UPDATE PANEL SCHEDULES & PANEL LABELS ON ALL PANELS SHOWN MODIFIED REFLECTING CHANGES. CIRCUIT NUMBERS ARE SHOWN TO INDICATE QUANTITIES. ADJUST NUMBERS PER JOB CONDITIONS.
 - B. AT END OF JOB, EACH PANEL WITH MODIFICATIONS SHALL HAVE NEW ENGRAVED NAMEPLATE AND NEW TYPED DIRECTORY SCHEDULE IDENTIFYING TYPE OF LOAD AND AREA SERVED.
 - C. PROVIDE AND INSTALL BONDING CONDUCTOR TO EACH ELECTRICAL ITEM AND OTHERS AS INDICATED.
 - D. ALL OUTLET PLATEPLATES SHALL MATCH EXISTING.
 - E. ALL WIRING SHALL BE CONCEALED.
 - F. ALL WIRES SHALL BE RUN IN CONDUIT OR DUCT SYSTEM WITH BOTH ENDS TAGGED. MINIMUM CONDUIT SIZE SHALL BE 1/2" UNLESS INDICATED OTHERWISE.
 - G. ALL WIRING TO LIGHTING FIXTURES SHALL BE IN CONDUIT EXCEPT DROPS TO FIXTURES. DROPS (WHIPS) TO LIGHT FIXTURES SHALL BE FLEXIBLE MC CABLE, MAXIMUM 6' LONG.
 - H. ALL PENETRATIONS THROUGH WALLS SHALL BE SEALED. FIRE STOP SEALANTS SHALL BE USED TO MEET RATINGS OF WALLS BEING PENETRATED.
 - I. OUTLET BOXES FOR ALL CONCEALED WORK SHALL BE MINIMUM 4" SQUARE, WITH RAISED COVERS AS REQUIRED TO EXTEND FLUSH TO FINISHED SURFACE.
- 3.3 TESTING AND ADJUSTING
 - A. THE INSTALLATION SHALL BE FREE FROM SHORT CIRCUITS AND IMPROPER GROUNDS. TEST IN THE PRESENCE OF THE ARCHITECTS OR THEIR REPRESENTATIVES.
 - B. TEST ALL LIGHTING AND OUTLETS FOR PROPER OPERATION, INCLUDING ADJACENT SPACES TO ASSURE THAT THEY WERE NOT AFFECTED BY THE RENOVATIONS.
 - C. TEST EACH SYSTEMS FOR PROPER OPERATION AND MAKE ADJUSTMENTS AS REQUIRED TO SATISFY THE CONSTRUCTION MANAGER AND THE OWNER.



HARRIMAN

AUBURN PORTLAND MANCHESTER

IMMUCELL CORPORATION ADDITION

PORTLAND, MAINE

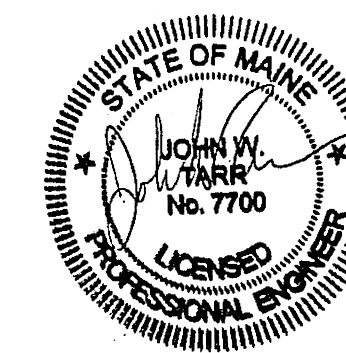
Harriman Project No. 14326

Key Plan Proj North



Issue or Revisions

Mark	Date	Description
-	07-01-14	PROGRESS
-	07-25-14	ISSUED FOR CONSTRUCTION



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ELECTRICAL LEGEND AND FIXTURE SCHEDULE

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