

SYMBOLS

	JUNCTION BOX
	DUPLEX RECEPTACLE OUTLET, NEMA 5-20R, MOUNTED 18" AFF
	GROUND FAULT INTERRUPTER RECEPTACLE 20 AMP FUSED THROUGH TYPE
	SPECIAL PURPOSE RECEPTACLE AS NOTED
	MOTOR
	EXTERNALLY OPERATED FUSED DISCONNECT SWITCH, SIZE, FUSE SIZE, PHASE AND QUANTITY AS INDICATED. NUMBER INDICATES NEMA TYPE ENCLOSURE, NO NUMBER INDICATES NEMA '1' TYPE ENCLOSURE.
	EXTERNALLY OPERATED NON-FUSED DISCONNECT SWITCH, SIZE, FUSE SIZE, PHASE AND QUANTITY AS INDICATED. 'N' INDICATED NEMA TYPE ENCLOSURE, NO NUMBER INDICATES NEMA '1' TYPE ENCLOSURE.
	COMBINATION MOTOR STARTER FUSED DISCONNECT, SIZE, FUSE SIZE, PHASE AND QUANTITY AS INDICATED. 'N' INDICATED NEMA TYPE ENCLOSURE, NO NUMBER INDICATES NEMA '1' TYPE ENCLOSURE.
	PUSH BUTTON CONTROL STATION
	SURFACE MOUNTED PANELBOARD AND CABINET
	CONCEALED CONDUIT - NUMBER OF SLASHES INDICATE NUMBER OF WIRES (WHEN MORE THAN TWO) PROVIDE GROUND WIRE IN ALL CONDUITS (SIZE PER NEC 250.122 UNLESS NOTED OTHERWISE); GROUNDS ARE NOT SHOWN BY SLASHES. SLASHES WHERE SHOWN ARE FOR CONVENIENCE OF THE CONTRACTOR ONLY; PROVIDE NUMBER OF CONDUCTORS AS REQUIRED BY CIRCUIT FUNCTION.
	HOME RUN TO PANELBOARD - '1S' - INDICATES PANEL DESIGNATION 1,3,5 - INDICATES CIRCUIT BREAKER NO.
	NEW CONDUIT
	FLEXIBLE CONDUIT
	SINGLE POLE SWITCH, 20 A OR LOW VOLTAGE TYPE. MAX HEIGHT = 42" TO CENTERLINE OR AS NOTED ON DRAWINGS.
	WALL MOUNTED LUMINAIRE
	'O' INDICATES SWITCH LOCATION, 2 INDICATED CIRCUIT NUMBER.
	BURIED #4/0 BARE COPPER
	GROUND ROD
	GROUND CONNECTION
	TRANSFORMER, TYPE AS NOTED
	CIRCUIT BREAKER
	FUSED SWITCH, LOAD BREAK

ABBREVIATIONS

A	AMPERES	GFCI	GROUND FAULT CIRCUIT INTERRUPTER
ADA	AMERICANS WITH DISABILITIES ACT (1990) ABOVE FINISHED FLOOR	GND	GROUND
AFF	ABOVE FINISHED FLOOR	HP	HORSEPOWER
AFG	ABOVE FINISHED GRADE	IMC	INTERMEDIATE METAL CONDUIT
AIC	AMPERES INTERRUPTING CAPACITY	KW	KILOWATTS
AC	ALTERNATING CURRENT	KVA	KILOVOLT AMPS
AWG	AMERICAN WIRE GAUGE	LPMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT
#/C	NUMBER OF CONDUCTORS	MCB	MAIN CIRCUIT BREAKER
C	CONDUIT	MCP	MOTOR CIRCUIT PROTECTOR
EMT	ELECTRICAL METALLIC TUBING	MLO	MAIN LUGS ONLY MOTOR
EPO	EMERGENCY POWER OFF	MCC	MOTOR CONTROL CENTER
EWG	ELECTRIC WATER COOLER	MFG	MANUFACTURER
FMC	FLEXIBLE METAL CONDUIT	NEC	NATIONAL ELECTRICAL CODE
FU	FUSE	NEMA	MANUFACTURERS ASSOCIATION
GFI	GROUND FAULT INTERRUPTER	N, NEU	NEUTRAL
		PH	PHASE

GENERAL NOTES

- GENERAL
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL ELECTRICAL INSTALLATIONS WITH ALL OTHER TRADES TO AVOID ANY CONFLICTS WITH PIPING, STRUCTURE, ETC.
- DRAWINGS ARE DIAGRAMMATIC IN NATURE AND CANNOT SHOW EVERY CONNECTION, J-BOX, WIRE, CONDUIT, ETC. THE EXACT LOCATION AND ARRANGEMENT OF ALL PARTS SHALL BE DETERMINED AS THE WORK PROGRESSES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEM.
- ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF RACEWAYS OR EQUIPMENT SHALL BE PERFORMED BY A TRADESMAN EXPERIENCED IN THE WORK REQUIRED. ALL FINISHES SHALL MATCH EXISTING ADJACENT SURFACES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY LOSS OR DAMAGE CAUSED BY THE CONTRACTORS PERSONNEL TO THE FACILITY DURING THE COURSE OF CONSTRUCTION, AND SHALL BE RESPONSIBLE FOR REPAIRING OR REPAIRING SUCH.
- INCIDENTAL ITEMS NOT INDICATED ON DRAWINGS NOR MENTIONED IN THE SPECIFICATIONS THAT CAN BE LEGITIMATELY AND REASONABLY INFERRED TO BELONG TO THE WORK DESCRIBED OR NECESSARY IN GOOD PRACTICE TO PROVIDE A COMPLETE SYSTEM, SHALL BE FURNISHED AND INSTALLED AS THOUGH ITEMIZED HERE IN EVERY DETAIL.
- CONTRACTOR SHALL FURNISH MATERIALS, TOOLS, SERVICES, LABOR, ETC., FOR A COMPLETE ELECTRICAL INSTALLATION UNLESS OTHERWISE NOTED ON PLANS.
- ALL WORK SHALL COMPLY WITH ALL APPLICABLE CITY, COUNTY, STATE, AND SERVING ELECTRICAL UTILITIES' CODES, ORDINANCES RULES, REGULATIONS, ETC. THE ENTIRE ELECTRICAL INSTALLATION SHALL COMPLY WITH OR SURPASS THE 2008 EDITION OF THE NATIONAL ELECTRICAL CODE (N.E.C.).
- ALL MATERIALS AND EQUIPMENT FURNISHED BY THE ELECTRICAL CONTRACTOR SHALL BE NEW AND OF FIRST-CLASS QUALITY, FREE FROM DEFECTS AND SHALL CONFORM WITH UNDERWRITERS LABORATORIES (UL) STANDARDS, WHERE APPLICABLE, UNLESS OTHERWISE NOTED ON PLANS.
- DO NOT INTERRUPT EXISTING UTILITIES SERVING OCCUPIED OR USED FACILITIES, EXCEPT WHEN AUTHORIZED. PROVIDE TEMPORARY SERVICES DURING INTERRUPTIONS TO EXISTING FACILITIES AS REQUIRED.
- WHERE CORE DRILLING OF FLOORS/WALLS IS REQUIRED, CONTRACTOR SHALL SEAL OPENINGS AFTER UTILITIES HAVE BEEN INSTALLED. LOCATION OF CORED HOLES SHALL COORDINATE WITH LOCATION OF EQUIPMENT IN A MANNER TO BE CLEAN AND FUNCTIONAL. THE CONTRACTOR SHALL INSTALL ONLY ONE CONDUIT PER HOLE AND SEAL THE OPENING AROUND THE CONDUIT AS SPECIFIED.
- PROVIDE FIRE RETARDANT UL APPROVED SEALANT ON ALL RACEWAY PENETRATIONS OF FIRE RATED CEILINGS, PARTITIONS, WALLS AND STRUCTURAL SLABS. IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO VERIFY PRIOR TO SUBMITTING BID, LOCATIONS OF ALL SUCH FIRE RATED PARTITIONS, WALLS AND STRUCTURAL SLABS.
- THE INSTALLATION SHALL COMPLY WITH BOTH THE REQUIREMENTS OF OSHA, ADA GUIDELINES, NFPA, NESC AND THE NEC. IN COMPLIANCE WITH OSHA, CONTRACTOR SHALL FOLLOW LOCKOUT/TAGOUT REGULATIONS AND PROVIDE THE PERSONNEL WHO HAVE TO WORK ON THE MECHANICAL EQUIPMENT SERVICED BY THE NEW ELECTRICAL SYSTEM WITH A COMPLETELY MAINTAINABLE SYSTEM BASED ON THOSE REGULATIONS.
- PROVIDE CONDUIT SEALS AS REQUIRED BY NEC ARTICLE 514.
- BURIED CONDUIT SHALL BE RIGID PVC SCHEDULE 40 BURIED UNDER 2 FEET OF COVER. THE RISERS SHALL BE RGS WITH THE TRANSITION STARTING IN THE HORIZONTAL RUN. THE ENTIRE RGS RISER WHERE IN CONTACT WITH EARTH SHALL BE WRAPPED WITH ONE (1) LAYER OF HALF WRAPPED 20 MIL PVC TAPE TO A MINIMUM OF 6 INCHES ABOVE GRADE. A GROUND WIRE #12 AWG MINIMUM SHALL BE INSTALLED IN ALL UNDERGROUND CONDUITS.
- WIRE AND CABLE
1. ALL NEW WIRING SHALL BE INSTALLED IN CONDUIT WITHOUT EXCEPTION, SIZE PER LATEST N.E.C., AS A MINIMUM, OR AS INDICATED.
- ALL WIRE SHALL BE MINIMUM #12 AWG STRANDED COPPER CONDUCTORS. ONLY EXCEPTION IS FIRE ALARM CIRCUITS WHERE #14 SOLID COPPER CONDUCTORS SHALL BE USED.
- ALL CONDUCTORS SHALL BE MINIMUM 75 DEGREES C, THW, THWN, XHHW, TYPE INSULATION COPPER, U.O.N.
- ALL CABLES SHALL HAVE 600 VOLT INSULATION UNLESS OTHERWISE SPECIFIED.

PR	PAIR
PVC	POLYVINYL CHLORIDE
REM	REMARK
RGS	RIGID GALVANIZED STEEL
SDBC	STRANDED BARE COPPER
SHLDSH	SHIELDED
SN	SOLID NEUTRAL
SP	SPARE
TYP	TYPICAL
UL	UNDERWRITERS LABORATORIES
UPS	UNINTERRUPTIBLE POWER SOURCE
UN	UNLESS OTHERWISE NOTED
V	VOLTS
W	WATTS
WP	WEATHERPROOF
XFRM	TRANSFORMER

- ALL WIRING TO EQUIPMENT SHALL COMPLY WITH THE MANUFACTURERS RECOMMENDATIONS, U.O.N.
- USE ONLY UL APPROVED WIRE LUBRICANT, NO GREASE OR SILICONE SHALL BE USED.
- ALL CONDUIT SHALL BE RUN CONCEALED WHERE POSSIBLE.
- EMPTY CONDUITS SHALL CONTAIN A PULL TAPE.
- JUNCTION BOXES AND DEVICES
1. JUNCTION BOX COVERS SHALL BE ATTACHED WITH MACHINE SCREWS ONLY, NO SELF TAPPING SCREWS OR WOOD SCREWS SHALL BE USED IN ATTACHING COVERS.
- USE GROUNDING BUSHINGS ON ALL ENCLOSURES HAVING CONCENTRIC AND NON CONCENTRIC KNOCKOUTS.
- DO NOT USE POWDER ACTUATED, PLASTIC OR LEAD FASTENERS. INSTALL JUNCTION BOXES WITH MACHINE SREW TYPE FASTENERS.
- EQUIPMENT
1. ELECTRICAL EQUIPMENT ON ROOF OR OUTSIDE BUILDING SHALL BE NEMA 3R GASKETED.
- CONTRACTOR SHALL PROVIDE NEW, TYPED, UPDATED PANEL SCHEDULE INDEX CARDS FOR ALL PANELS, INSTALLED OR MODIFIED BY THIS PROJECT.
- CONTRACTOR SHALL VERIFY LOCATION AND SIZE OF ALL MECHANICAL EQUIPMENT PRIOR TO ELECTRICAL INSTALLATIONS.
- THE ELECTRICAL DRAWINGS SHOW THE APPROXIMATE LOCATION OF EQUIPMENT, VERIFY ALL EQUIPMENT LOCATIONS PRIOR TO INSTALLATIONS.
- CONTRACTOR SHALL VERIFY THE VOLTAGE, PHASE ROTATION, NEUTRAL, AND GROUND CONNECTIONS TO ALL EQUIPMENT. MATCH PHASE ROTATION OF THE EXISTING POWER SOURCE.
- LABEL ALL POWER PANELS, DISC SWITCHES, RECEPTACLES, JUNCTION BOXES, ETC. WITH CIRCUIT NUMBERS. SEE SPECIFICATIONS FOR DETAILS.
- THE SIZING OF CABLES, DISCONNECT SWITCHES, BREAKERS, ETC ARE BASED ON INFORMATION GIVEN IN OTHER PORTIONS OF THE PLANS AND SPECIFICATIONS. IF MOTORS OR ANY OTHER COMPONENTS ARE FURNISHED IN SIZES OTHER THAN INDICATED, IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO INFORM THE ENGINEER OF RECORD SO THAT THE NECESSARY CHANGES CAN BE MADE.
- SWITCHBOARDS AND PANELBOARDS
1. ALL BUSSING SHALL BE FULL CAPACITY PLATED COPPER.
- BARRIERS BETWEEN ADJACENT SWITCHBOARD SECTIONS SHALL BE STEEL.
- VERIFY AVAILABLE SHORT CIRCUIT CURRENT PRIOR TO ORDERING ALL ELECTRICAL EQUIPMENT.

OUTDOOR LIGHTING CODE CALCULATION

OUTDOOR LIGHTING CALCULATION PER PIMA COUNTY OUTDOOR LIGHTING CODE ORDINANCE NO. 2006-91.

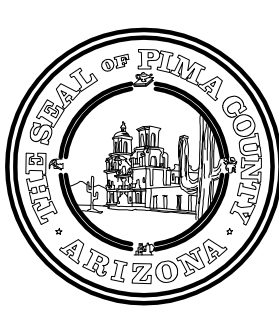
EXISTING TOTAL PIMA COUNTY RICHEY BLVD STATION SITE LUMENS IS BASED ON SITE INVESTIGATION AND RESEARCH OF EXISTING AS-BUILT DRAWINGS, PERFORMED BY M3 ENGINEERING ON OCTOBER 11, 2010.

CALCULATION IS FROM TABLE 5.1, OPTION 2, OF THE PIMA COUNTY OUTDOOR LIGHTING CODE FOR AREA T2Z ALLOWABLE LUMENS = 65,000/ACRE.

TOTAL SITE IN ACRES = 3.45 ACRES
TOTAL ALLOWABLE SITE LUMENS = 65,000 X 3.45 ACRES = 224,250

EXISTING SITE LUMENS	=	186,880
SITE LUMENS ADDED BY THIS PROJECT	=	17,600
TOTAL REVISED SITE LUMENS	=	204,480
204,480 < 224,250		

THEREFORE, PROPOSED PROJECT OUTDOOR LIGHTING DESIGN COMPLIES WITH PIMA COUNTY OUTDOOR LIGHTING ORDINANCE NO. 2006-91 EXHIBIT H.



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Revisions

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ELECTRICAL NOTES, SYMBOLS AND GENERAL NOTES

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