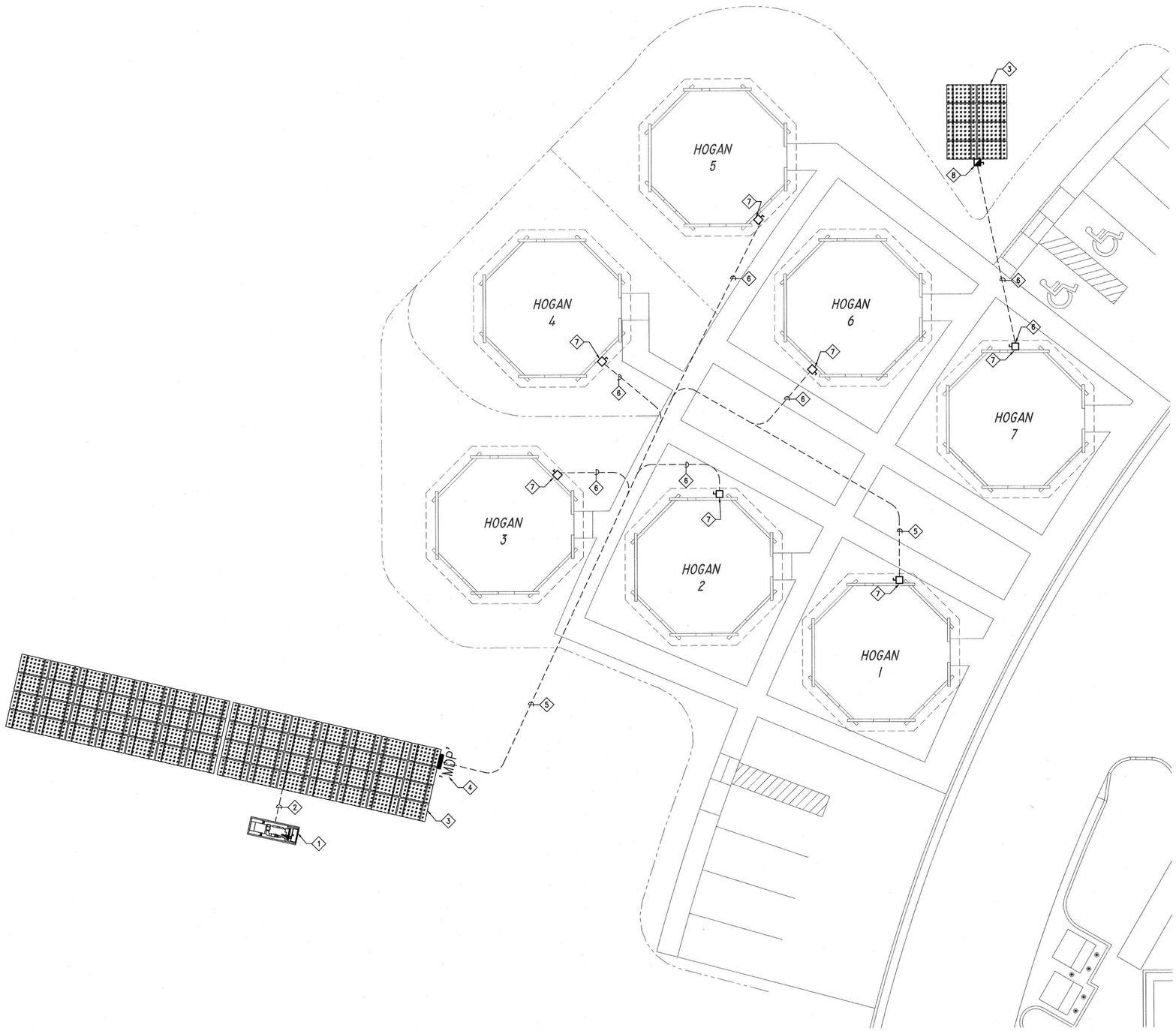


GENERAL NOTES:

1. ELECTRICAL CONTRACTOR TO REFER TO THE CIVIL ENGINEER'S DRAWING AND COORDINATE ELECTRICAL INSTALLATION WITH ALL UTILITIES.

KEYED NOTES

1. PROPANE FUELED BACKUP GENERATOR. PROVIDED AND INSTALLED BY OTHERS.
2. NEW CONDUIT TO BACKUP GENERATOR, PROVIDED AND INSTALLED BY OTHERS.
3. SOLAR ARRAY, PROVIDED AND INSTALLED BY OTHERS.
4. MAIN DISTRIBUTION PANELBOARD, SEE ONE LINE DIAGRAM.
5. SIX (6) PANELBOARD FEEDER CONDUITS, SEE ONE LINE DIAGRAM.
6. PANELBOARD FEEDER CONDUIT, SEE ONE LINE DIAGRAM.
7. UNIT MAIN SERVICE DISCONNECT SWITCH, SEE ONE LINE DIAGRAM.
8. SOLAR ARRAY SERVICE DISCONNECT SWITCH, SEE ONE LINE DIAGRAM.

ELECTRICAL SITE PLAN

SCALE: 1" = 10'-0"

N

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DESIGNED BY: KJH
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ROYAL ENGINEERING PROJECT NO. #11245.00
DATE PLOTTED: 27.01.2012

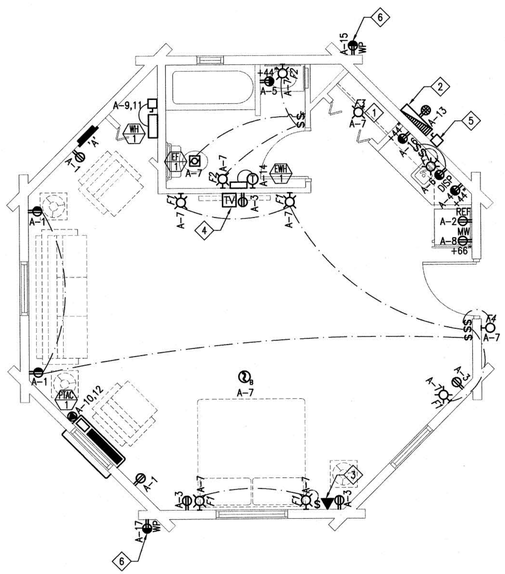
REVISIONS:	
DATE:	12-19-2012
VSS NO.	11-023

Professional Engineer (Electrical) STEVEN R. GRIFFITHS 12712 Date Issued: 1.27.12 ARIZONA U.S.A. EXPIRES: 12/31/13

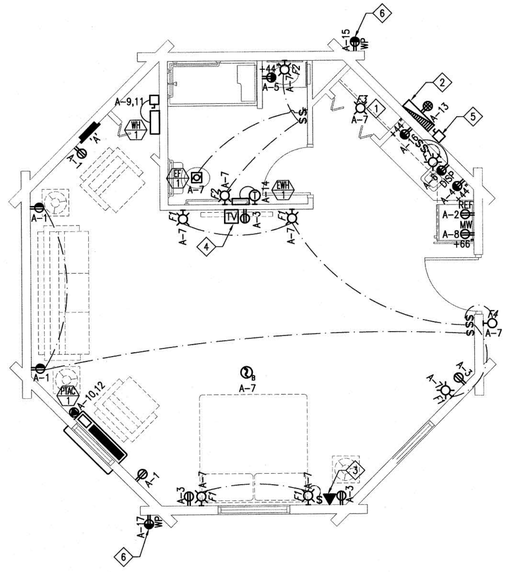
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ELECTRICAL SITE PLAN

E1.0



STANDARD UNIT ELECTRICAL PLAN
SCALE: 1/4" = 1'-0"



ACCESSIBLE UNIT ELECTRICAL PLAN
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. MULIT-WIRE BRANCH CIRCUITS: ELECTRICAL CONTRACTOR TO COMPLY WITH THE NATIONAL ELECTRICAL CODE, ARTICLE 210.4, MULIT-WIRE BRANCH CIRCUITS. ELECTRICAL CONTRACTOR TO ALLOW FOR MULIT-WIRE BRANCH CIRCUIT WIRE AMPACITY ADJUSTMENT AS PER ARTICLE 310, TABLE 310.15(B)(2)(A) OF THE NATIONAL ELECTRICAL CODE.
2. ALL 120 VOLT, SINGLE PHASE, 15 AND 20 AMPERE BRANCH CIRCUITS SUPPLYING OUTLETS IN DWELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, OR SIMILAR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER, COMBINATION-TYPE, INSTALLED TO PROVIDE PROTECTION OF THE BRANCH CIRCUIT.
3. PROVIDE AND INSTALL TAMPER-RESISTANT RECEPTACLES ON ALL 120 VOLT RECEPTACLES IN ALL AREAS SPECIFIED IN 210.52 OF THE NATIONAL ELECTRICAL CODE AS REQUIRED UNDER 406.11 OF THE NATIONAL ELECTRICAL CODE.

KEYED NOTES

1. PROVIDE FIXTURE WITH FACTORY INSTALLED INTEGRAL MOTION SENSOR.
2. 18"Wx18"Hx6"D TELEPHONE/CATV TERMINAL CABINET IN A LOCKABLE NEMA 3R ENCLOSURE. PROVIDE AND INSTALL A QUAD RECEPTACLE IN CABINET INTERIOR.
3. ¾" CONDUIT WITH (1)-CAT6 CABLE. PROVIDE AND INSTALL CONDUIT AND CABLE RUN TO TELEPHONE/CATV TERMINAL CABINET.
4. ¾" CONDUIT WITH (1)-RG60U CABLE PROVIDE AND INSTALL CONDUIT AND CABLE RUN TO TELEPHONE/CATV TERMINAL CABINET.
5. UNIT DISCONNECT SWITCH, SEE SITE PLAN AND ONE LINE DIAGRAM.
6. WEATHERPROOF GFCI DUPLEX RECEPTACLE MOUNTED IN EAVE NEAR DOWNSPOUT.

LOAD CENTER SCHEDULE

PANEL: A
VOLTAGE: 240/120
PHASE: 1 WIRE: 3
MOUNTING: FLUSH
ENCLOSURE: NEMA 1
REMARKS:

BUS AMPS: 100
MAIN DEVICE: LUGS
MINIMUM EQUIPMENT RATING: 22,000 AMPS RMS

USE CODE
R = RECEPTACLE LOAD
L = LIGHTING LOAD
E = EQUIPMENT LOAD
K = KITCHEN EQUIPMENTLOAD
M = MOTOR LOAD

BREAKER No.	BREAKER AMPS	BREAKER POLE	KEYED NOTE	CIRCUIT NAME	WIRE	GRD	CKT. LOAD USE	CKT. LOAD WATTS	LOAD/PHASE (VA) φA	LOAD/PHASE (VA) φB	CKT. LOAD WATTS	CKT. LOAD USE	FEEDER GRD	FEEDER WIRE	CIRCUIT NAME	KEYED NOTE	BREAKER POLE	BREAKER AMPS	BREAKER No.
1	20	1	B	UNIT RCPTS	#12	#12	R	720	1,920		1,200	E	#12	#12	REFRIGERATOR	C	1	20	2
3	20	1	B	UNIT RCPTS	#12	#12	R	720		900	180	R	#12	#12	KITCHEN RCPT	C	1	20	4
5	20	1	C	BATH RCPT	#12	#12	R	180	1,044		864	M	#12	#12	DISPOSAL	C	1	20	6
7	20	1	B	UNIT LTG	#12	#12	L/M	680		1,880	1,200	E	#12	#12	MICROWAVE	C	1	20	8
9	50	2		WATER HEATER	#8	#10	E	4,500	7,000		2,500	E	#10	#10	PTAC		2	30	10
11	–	–		–	#8	–	E	4,500		7,000	2,500	E	–	#10			–	–	12
13	20	1		COMM CAB RCPT	#12	#12	R	360	1,860		1,500	E	#12	#12	WALL HEATER		1	20	14
15	20	1	C	EXTERIOR RCPT @ EAVE	#12	#12	R	180		360	180	R	#12	#12	KITCHEN RCPT	C	1	20	16
17	20	1	C	EXTERIOR RCPT @ EAVE	#12	#12	R	180	180						SPARE		1	20	18
19	20	1		SPARE											SPARE		1	20	20
21	20	1		SPARE											SPARE		1	20	22
23	20	1		SPARE											SPARE		1	20	24

	φA	φB
RECEPTACLE LOAD w/o NEC 220.44 DEMAND (VA)	1,440	1,260
LIGHTING LOAD (VA)		500
125% LIGHTING CONTINUOUS LOAD PER NEC 210.20(A) (VA)		125
EQUIPMENT LOAD (VA)	9,700	8,200
KITCHEN DEMAND = 0 UNITS @ 100% AS PER NEC 220.56 (VA)		
MOTOR LOAD	864	680
TOTAL LOAD PER PHASE (VA):	12,004	10,765
TOTAL LOAD PER PHASE (AMPS):	29	26
TOTAL RECEPTACLE LOAD:	2,700	
DEMAND LOAD ADJUSTMENT FOR RECEPTACLES AS PER NEC 220.44 (VA)	0	
TOTAL RECEPTACLE DEMAND LOAD:	2,700	
DEMAND LOAD w/o 25% LARGEST MOTOR LOAD (VA):	22,769	
25% LARGEST MOTOR (VA)	261	
TOTAL DEMAND LOAD (VA):	23,030	
TOTAL_DEMAND LOAD (AMPS):	96	

KEYED NOTES:
A. LOCK-ON BREAKER
B. PROVIDE ARC FAULT (AFCI) PROTECTION.
C. PROVIDE GFCI PROTECTION.
D. SHUNT TRIP BREAKER.

GENERAL NOTES:
1. ALL INSULATION ON CONDUCTORS TO BE THHN UNLESS NOTED OTHERWISE. INSULATION ON ALL UNDERGROUND CONDUCTORS SHALL BE THHW.
2. LOAD DEMANDS CALCULATED AS PER SECTIONS 210 & 220 OF THE NATIONAL ELECTRICAL CODE.
3. PANEL COVER SHALL BE FIELD MARKED FOR FLASH PROTECTION WITH A PERMANENT LABEL AS REQUIRED BY THE NATIONAL ELECTRICAL CODE SECTION 110. LABEL SHALL READ AS FOLLOWS: "DANGER: POTENTIAL ARC FLASH HAZARD".
4. CIRCUIT IDENTIFICATION SHALL BE AS PER SECTION 408.4 OF THE NATIONAL ELECTRICAL CODE.

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DESIGNED BY: KJH
CHECKED BY: SRG
ROYAL ENGINEERING PROJECT NO. J11245.00
DATE PLOTTED: 27.01.2012

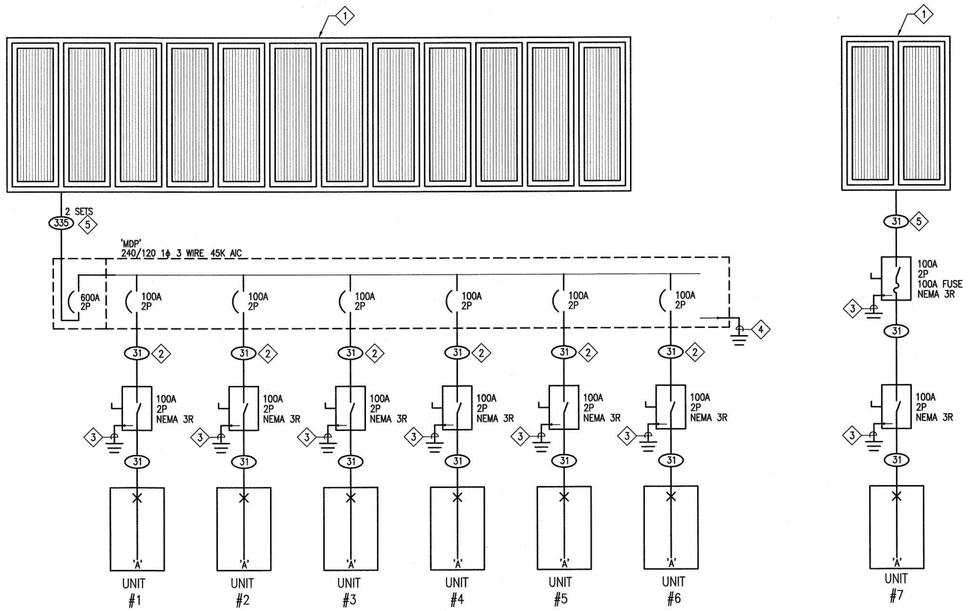
REVISIONS
DATE:
JOB NO. 11-023
12-18-2011

Registered Professional Engineer (Electrical)
STEVEN R. GRIFFITHS
23656
12-31-12
Date Signed
ARIZONA, U.S.A.
EXPIRES: 12/31/13

GUEST HOGANS
for N.A.T.I.V.E.
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ELECTRICAL PLANS AND SCHEDULES

E1.1



ONE LINE DIAGRAM
SCALE: NTS

GENERAL NOTES:

1. CONTRACTOR TO PROVIDE ALL TRENCHING AND BACKFILL.
2. PROVIDE AND INSTALL GROUNDING CONDUCTOR(S) IN ALL FEEDER CONDUITS REGARDLESS OF CONDUIT TYPE AS PER ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE. CONDUIT GROUNDING IS PROHIBITED, NO EXCEPTIONS TAKEN.
3. ALL FEEDERS ARE COPPER UNLESS NOTED OTHERWISE.

KEYED NOTES

1. SOLAR POWER ARRAY. PROVIDED, INSTALLED, AND FINAL CONNECTION TO PANELBOARD FEEDERS BY OTHERS.
2. NEW UNDERGROUND FEEDER PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. PROVIDE ALL TRENCHING AND BACKFILL.
3. #6 AWG COPPER TO GROUND AS PER ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE, SEE SERVICE GROUNDING DETAIL.
4. #2/0 AWG COPPER GROUND RECOMMENDED, VERIFY EXACT GROUND SIZE WITH SOLAR EQUIPMENT SUPPLIER/CONTRACTOR GROUNDING SHALL BE AS PER ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE, SEE SERVICE GROUNDING DETAIL.
5. RECOMMENDED CONDUIT AND WIRE SIZE. CONDUIT, WIRE, AND FINAL CONNECTION TO BE BY THE SOLAR ARRAY EQUIPMENT SUPPLIER/CONTRACTOR. SHOWN HERE FOR REFERENCE ONLY.

FEEDER SCHEDULE

TYPE	CONDUIT SIZE PVC	CONDUIT SIZE EMT	CONDUCTORS QTY.	CONDUCTORS SIZE	75°C AMP RATING
212	¾"	¾"	2	#12	
312	¾"	¾"	3	#12	25
412	¾"	¾"	4	#12	
20	¾"	¾"	2	#10	
30	¾"	¾"	3	#10	35
40	¾"	¾"	4	#10	
28	¾"	¾"	2	#8	
38	¾"	¾"	3	#8	50
48	¾"	¾"	4	#8	
26	¾"	¾"	2	#6	
36	¾"	¾"	3	#6	65
46	1"	1"	4	#6	
24	¾"	¾"	2	#4	
34	1"	1"	3	#4	85
44	1¼"	1¼"	4	#4	
23	1"	1"	2	#3	
33	1"	1"	3	#3	100
43	1¼"	1¼"	4	#3	
22	1"	1"	2	#2	
32	1¼"	1¼"	3	#2	115
42	1¼"	1¼"	4	#2	
21	1¼"	1¼"	2	#1	
31	1¼"	1¼"	3	#1	130
41	1½"	1½"	4	#1	

TYPE	CONDUIT SIZE PVC	CONDUIT SIZE EMT	CONDUCTORS QTY.	CONDUCTORS SIZE	75°C AMP RATING
21X	1¼"	1¼"	2	1/0	
31X	1½"	1½"	3	1/0	150
41X	1½"	1½"	4	1/0	
22X	1¼"	1¼"	2	2/0	
32X	1½"	1½"	3	2/0	175
42X	2"	2"	4	2/0	
23X	1½"	1¼"	2	3/0	
33X	2"	2"	3	3/0	200
43X	2"	2"	4	3/0	
24X	1½"	1½"	2	4/0	
34X	2"	2"	3	4/0	230
44X	2½"	2½"	4	4/0	
225	2"	2"	2	250 KCMIL	
325	2"	2"	3	250 KCMIL	255
425	3"	2½"	4	250 KCMIL	
230	2"	2"	2	300 KCMIL	
330	2½"	2½"	3	300 KCMIL	285
430	3"	2½"	4	300 KCMIL	
235	2"	2"	2	350 KCMIL	
335	2½"	2½"	3	350 KCMIL	310
435	3"	2½"	4	350 KCMIL	
240	2"	2"	2	400 KCMIL	
340	2½"	2½"	3	400 KCMIL	335
440	3"	3"	4	400 KCMIL	

TYPE	CONDUIT SIZE PVC	CONDUIT SIZE EMT	CONDUCTORS QTY.	CONDUCTORS SIZE	75°C AMP RATING
250	2½"	2½"	2	500 KCMIL	
350	3"	2½"	3	500 KCMIL	380
450	4"	3½"	4	500 KCMIL	
260	2½"	2½"	2	600 KCMIL	
360	3½"	3½"	3	600 KCMIL	420
460	4"	4"	4	600 KCMIL	
270	2½"	2½"	2	700 KCMIL	
370	3"	3"	3	700 KCMIL	460
470	4"	4"	4	700 KCMIL	
275	3"	3"	2	750 KCMIL	
375	4"	4"	3	750 KCMIL	475
475	4"	4"	4	750 KCMIL	

EQUIPMENT GROUNDING CONDUCTORS SCHEDULE

OVERCURRENT DEVICE	COPPER
15	14
20	12
30	10
40	10
60	10
100	8
200	6
300	4
400	3
500	2
600	1
800	1/0
1000	2/0
1200	3/0
1600	4/0
2000	250KCMIL
2500	350KCMIL
3000	400KCMIL
4000	500KCMIL

NOTE:
1. SEE EQUIPMENT GROUND CONDUCTOR SCHEDULES OR SERVICE GROUNDING DETIAIL FOR GROUND CONDUCTORS RATING.
2. ALL INSULATION SHALL BE THHN UNLESS NOTED OTHERWISE.
3. PVC CONDUIT SIZE IS BASED ON SCHEDULE 40 PVC. PVC IS APPROVED FOR UNDERGROUND FEEDERS ONLY.

FAULT CURRENT CALCULATION SCHEDULE

SOLAR ARRAY	ARRAY VOLTAGE	AVAILABLE FAULT CURRENT
	240	45,000 AIC

FEEDER FROM	TO	DISTANCE	AVAILABLE FAULT CURRENT	CONDUIT TYPE	FEEDER SIZE	FEEDERS PER PHASE	VOLTAGE LINE TO LINE VOLTS	VOLTAGE XFMR PRIMARY VOLTS	VOLTAGE XFMR SECONDARY VOLTS	FAULT CURRENT AT EQUIPMENT	FULL OR SERIES RATED	MINIMUM SYMMETRICAL EQUIPMENT AIC RATING
ARRAY	UNIT 1 PNL	110'-0"	45,000 AIC	PVC	#6 AWG	1	240	---	---	4,743 AIC	FULL	10,000 AIC
ARRAY	UNIT 2 PNL	75'-0"	6,945 AIC	PVC	#6 AWG	1	240	---	---	6,945 AIC	FULL	10,000 AIC
ARRAY	UNIT 3 PNL	75'-0"	6,945 AIC	PVC	#6 AWG	1	240	---	---	6,945 AIC	FULL	10,000 AIC
ARRAY	UNIT 4 PNL	100'-0"	5,352 AIC	PVC	#6 AWG	1	240	---	---	5,352 AIC	FULL	10,000 AIC
ARRAY	UNIT 5 PNL	125'-0"	4,353 AIC	PVC	#6 AWG	1	240	---	---	4,353 AIC	FULL	10,000 AIC
ARRAY	UNIT 6 PNL	150'-0"	3,669 AIC	PVC	#6 AWG	1	240	---	---	3,669 AIC	FULL	10,000 AIC
ARRAY	UNIT 7 PNL	50'-0"	9,889 AIC	PVC	#6 AWG	1	240	---	---	9,889 AIC	FULL	10,000 AIC

DISTRIBUTION PANELBOARD SCHEDULE

PANEL:	MDP	BUS AMPS:	600
VOLTAGE:	240Y / 120	MAIN DEVICE:	MLO
PHASE: 1	WIRE: 3	MAIN BUS BRACING (AMPS RMS SYM):	42,000
ENCLOSURE:	NEMA 3R		
MOUNTING:	SURFACE		
REMARKS:	I-LINE SERVICE RATED TYPE		

CKT. #	DESCRIPTION	LOAD DESIGN KVA	LOAD DESIGN FLA	LOAD DEMAND KVA	LOAD DEMAND FLA	OVERCURRENT DEVICE BREAKER AMP TRIP	OVERCURRENT DEVICE BREAKER POLE	OVERCURRENT DEVICE BREAKER AMP FRAME
1	UNIT #1	23.0	96.0	23.0	96.0	100	2	150
2	UNIT #2	23.0	96.0	23.0	96.0	100	2	150
3	UNIT #3	23.0	96.0	23.0	96.0	100	2	150
4	UNIT #4	23.0	96.0	23.0	96.0	100	2	150
5	UNIT #5	23.0	96.0	23.0	96.0	100	2	150
6	UNIT #6	23.0	96.0	23.0	96.0	100	2	150
DESIGN KVA:	138.2	DESIGN FLA:	575.8					
DEMAND KVA:	138.2	DEMAND FLA:	575.8					

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Licensed Professional Engineer (Electrical) STATE OF ARIZONA 24626 STEVEN R. GRIFFIN 21-14 Date Signed U.S.A. EXPIRES: 12/31/13

DESIGNED BY: KJH
CHECKED BY: SRG
ROYAL ENGINEERING PROJECT NO. J11245.00
DATE PLOTTED: 27.01.2012

NO.	DATE	REVISIONS
1	12-18-2012	
2	1-2013	

GUEST HOGANS
For N.A.T.I.V.E.
KAYENTA, ARIZONA 86033

ELECTRICAL ONE LINE DIAGRAM

E2.1

ELECTRICAL SYMBOLS

NOTE: THIS IS A TYPICAL SYMBOL LIST, NOT ALL SYMBOLS ARE USED ON THIS PROJECT. DOTTED SYMBOLS INDICATE EXISTING FIXTURE, EQUIPMENT, ETC.

SYMBOL	EXPLANATION
	BRANCH CIRCUIT CONCEALED IN CEILING OR WALL
	BRANCH CIRCUIT CONCEALED IN GROUND OR FLOOR
	BRANCH CIRCUIT HOMERUNS TO PANEL
DOWN / UP	CONDUIT STUB – VERTICAL
	CONDUIT STUB – HORIZONRAL (CAP CONDUIT)
SURFACE / FLUSH	PANELBOARD – 480Y/277 VOLT
SURFACE / FLUSH	PANELBOARD – 208Y/120 VOLT, 208/120 VOLT, 240/120 VOLT
X	MECHANICAL EQUIPMENT SYMBOL
XX	KITCHEN EQUIPMENT SYMBOL
X	KEYED NOTE REFERENCE
J CEILING / K WALL / J FLOOR	JUNCTION BOX – POWER
C CEILING / K WALL / C FLOOR	JUNCTION BOX – COMMUNICATIONS SYSTEM (TELEPHONE/DATA)
	DUPLEX RECEPTACLE
WP — MODIFIER; A-3 — PANEL SPACE ASSIGNMENT; REF — EQUIPMENT DESIGNATION	
WP	WEATHERPROOF COVER
+44"	MOUNTING HEIGHT ABOVE FLOOR OR GRADE GIVEN IN INCHES
REF	REFRIGERATOR
DW	DISHWASHER
DISP	DISPOSAL
WASH	WASHING MACHINE
	GROUND FAULT DUPLEX RECEPTACLE
	QUAD RECEPTACLE
	GROUND FAULT QUAD RECEPTACLE
	SPLIT WIRED DUPLEX RECEPTACLE
WP	DUPLEX RECEPTACLE WEATHERPROOF WITH GFCI
EWC	DUPLEX RECEPTACLE FOR ELECTRIC WATER COOLER (EWC)
	220V RECEPTACLE
	ISOLATED GROUND RECEPTACLE
	DUPLEX RECEPTACLE – FLOOR MOUNTED
	DUPLEX RECEPTACLE – CEILING MOUNTED
	SPECIAL RECEPTACLE
	POWER/DATA/TELEPHONE POLE
	MUTI-OUTLET WIREWAY
	DRY TYPE TRANSFORMER (PLAN VIEW)
	DISTRIBUTION SWITCHBOARD
	TELEPHONE AND/OR DATA TERMINAL BOARD
NON-FUSED / FUSED	DISCONNECT SWITCH
NON-FUSED / FUSED	DISCONNECT SWITCH WITH MOTOR STARTER
	MOTOR STARTER
VFD	VARIABLE FREQUENCY DRIVE
	FLUORESCENT FIXTURE (TYPICAL)
EM	FLUORESCENT FIXTURE ON EMERGENCY CIRCUIT OR WITH EMERGENCY BATTER PACK
	CEILING MOUNTED FIXTURE
	PENDANT MOUNTED FIXTURE
	RECESSED FIXTURE
	WALL MOUNTED FIXTURE
	HID WALL PACK
	FLUORESCENT STRIP
	TRACK LIGHTING
	EMERGENCY LIGHTING UNIT
F1	FIXTURE TYPE SYMBOL
CEILING / WALL	EXIT LIGHT (SINGLE FACE)
CEILING / WALL	EXIT LIGHT (DOUBLE FACE)
CEILING / WALL	EXIT LIGHT WITH DIRECTIONAL ARROW (SINGLE FACE)
CEILING / WALL	EXIT LIGHT WITH DIRECTIONAL ARROW(S) (DOUBLE FACE)
42X	FEEDER TAG (SEE FEEDER SCHEDULE)

SYMBOL	EXPLANATION
$	SINGLE POLE SWITCH (SUBSCRIPT AS INDICATED BELOW)
2	TWO POLE SWITCH
3	3-WAY SWITCH
4	4-WAY SWITCH
D	DIMMER SWITCH
K	KEYED SWITCH
T	TIMER SWITCH
M	MANUAL STARTER WITH THERMAL OVERLOAD
F	EXHAUST FAN TIMER SWITCH
OC	OCCUPANCY SENSOR SWITCH
P	PILOT LIGHT
$*$^b	CONTROLLING SWITCH (LETTER INDICATES CONTROL CIRCUIT)
$$	DOUBLE GANG SWITCH
(S)	OCCUPANCY SENSOR SWITCH (CELLING MOUNTED)
(M)	MOTOR (NUMBER INDICATES HORSEPOWER)
(T)	THERMOSTAT OUTLET
	EXHAUST FAN (CEILING MOUNTED)
	BELL
	PUSHBUTTON
	STOP/START STATION
	"EMERGENCY POWER OFF" MUSHROOM TYPE BUTTON
AMP	SOUND SYSTEM AMPLIFIER
V	SOUND SYSTEM VOLUME CONTROL
S CEILING / S WALL	SOUND SYSTEM SPEAKER
M WALL / M FLOOR	SOUND SYSTEM MICROPHONE
S	SOUND SYSTEM CONDUIT
WALL / FLOOR	TELEPHONE OUTLET
WALL / FLOOR	COMPUTER DATA OUTLET
WALL / FLOOR	DATA AND VOICE OUTLET
TV	TELEVISION OUTLET
P CEILING / P WALL	PHOTOCELL
TS	TIME SWITCH
LC	LIGHTING CONTACTOR
F	FIRE ALARM PULL STATION
	FIRE ALARM HORN/STROBE
	FIRE ALARM STROBE
	SMOKE DETECTOR (SUBSCIPT AS INDICATED BELOW)
CO	SMOKE AND CARBON MONOXIDE DETECTOR COMBINATION
B	SMOKE DETECTOR/ALARM BATTERY-BACKED
D	DUCT SMOKE DETECTOR
R	SMOKE DETECTOR WITH ELEVATOR RECALL MODULE
	HEAT DETECTOR
	CARBON MONOXIDE GAS DETECTOR
	TAMPER SWITCH
	FLOW SWITCH
	PRESSURE SWITCH
	POST INDICATION VALVE
	DOOR HOLDER
	FIRE/SMOKE DAMPER
	FIREMAN'S PHONE
CM	CONTROL MODULE
MM	MONITOR MODULE
R	FIRE ALARM RELAY
GAA	FIRE ALARM GENERATOR ANNUNCIATOR
FST	FIRE ALARM TRANSMISSION (MONITORING) DEVICE
FACP	FIRE ALARM CONTROL PANEL
FAA	FIRE ALARM REMOTE ANNUNCIATOR PANEL
	INTERCOM CALL BUTTON
S CEILING / S WALL	INTERCOM SYSTEM SPEAKER
PMI	MASTER INTERCOM CONTROL
	CLOCK SYSTEM WALL CLOCK

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	EWC	ELECTRIC WATER COOLER	NIC	NOT IN CONTRACT
AFP	ARC FAULT PROTECTOR	EWH	ELECTRIC WATER HEATER	NL	NIGHT LIGHT
AIC	AMP INTERRUPTING CURRENT (SYMMETRICAL)	(F)	FUTURE	NFS	NON-FUSED SWITCH
AL	ALUMINUM	FA	FIRE ALARM	NTS	NOT TO SCALE
BG	BELOW GRADE	FLA	FULL LOAD AMPS	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
C	CONDUIT	FS	FUSED SWITCH	OFOI	OWNER FURNISHED OWNER INSTALLED
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	PNL	PANEL
CKT	CIRCUIT	GFP	GROUND FAULT PROTECTOR	(R)	RELOCATE
CO	CONDUIT ONLY	GRC	GALVANIZED RIGID CONDUIT	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
CU	COPPER	GRD	GROUND	TYP	TYPICAL
C/w	CONDUIT WITH	IG	ISOLATED GROUND	UNO	UNLESS NOTED OTHERWISE
DISP	DISPOSAL	MCB	MAIN CIRCUIT BREAKER	WASH	WASHER
DRY	DRYER	MCC	MOTOR CONTROL CENTER	WP	WEATHER PROOF
DW	DISHWASHER	MH	MANHOLE	(D)	DEMOLISH/DELETE
EM	EMERGENCY	MLO	MAIN LUGS ONLY	XFMR	TRANSFORMER
(E)	EXISTING	MW	MICROWAVE	(XP)	EXPLOSION PROOF
EPO	EMERGENCY POWER OFF	(N)	NEW		

NOTE: THIS IS A TYPICAL ABBREVIATION LIST. NOT ALL ABBREVIATIONS AE USED ON THIS PROJECT.

EQUIPMENT SCHEDULE

		ELECTRICAL				DISCONNECT							
UNIT #	DESCRIPTION	VOLTS	PHASE	LOAD		DISCONNECT TYPE	SIZE	FUSE	STARTER SIZE	ENCLOSURE TYPE	NEMA OUTLET TYPE	REFERENCE NOTE	REMARKS
EF-1	EXHAUST FAN	120	1	200 VA	1.7 AMPS	14A	–	–	–	20	–	–	SEE GENERAL NOTE #5, SHEET E1.1
PTAC-1	THRU THE WALL AC UNIT	240	1	5,000 VA	20.8 AMPS	13A	–	–	–	20	–	–	SEE GENERAL NOTE #5, SHEET E1.1
EWH-1	ELECTRIC WALL HEATER	120	1	1,500 VA	12.5 AMPS	17A	–	–	–	20	–	–	SEE GENERAL NOTE #5, SHEET E1.1
WH-1	INSTANTANEOUS ELEC WATER HEATER	240	1	9,000 VA	37.5 AMPS	1A	60A/2P	–	–	20	–	–	SEE GENERAL NOTE #5, SHEET E1.1

NOTES:
1. NON-FUSED DISCONNECT SWITCH
2. FUSED DISCONNECT SWITCH
3. BREAKER IN ENCLOSURE
4. FUSED DISCONNECT SWITCH WITH SHUNT TRIP
5. MANUAL STARTER WITH THERMAL OVERLOAD
6. MAGNETIC STARTER
7. MAGNETIC STARTER/NON-FUSED DISCONNECT COMBINATION
8. MAGNETIC STARTER/FUSED DISCONNECT COMBINATION
9. MAGNETIC STARTER/BREAKER COMBINATION
10. VARIABLE SPEED DRIVE
11. REDUCED VOLTAGE STARTER
12. DIRECT CONNECTION
13. RECEPTACLE/SPECIAL PURPOSE OUTLET ETC.
14. INTEGRAL RECEPTACLE
15. TWO-SPEED STARTER, COORDINATE WITH MOTOR TYPE
16. JUNCTION OR PULL BOX
17. THERMOSTAT
18. PANELBOARD
19. SEE PANELBOARD SCHEDULE FOR SIZE
20. PROVIDE WITH NEMA 1 ENCLOSURE
21. PROVIDE WITH NEMA 3R ENCLOSURE
22. MAXIMUM CIRCUIT AMPS (MCA)
23. FULL LOAD CURRENT
24. CONDUIT RUN ONLY WITH NYLON PULL STRING (SEE PANEL SCHEDULE OR ONE LINE DIAGRAM)

A. FURNISHED, INSTALLED AND FINAL CONNECTION BY THE ELECTRICAL CONTRACTOR.
B. FURNISHED AND INSTALLED UNDER ANOTHER DIVISION, FINAL CONNECTION BY THE ELECTRICAL CONTRACTOR.
C. FURNISHED UNDER ANOTHER DIVISION, INSTALLED AND FINAL CONNECTION BY THE ELECTRICAL CONTRACTOR.
D. FURNISHED, INSTALLED AND FINAL CONNECTION UNDER ANOTHER DIVISION.

GENERAL NOTES:
1. VERIFY ALL EQUIPMENT LOCATIONS AND CONNECTION REQUIREMENTS (i.e. VOLTAGE, PHASE, FLA, ETC.) WITH MECHANICAL DRAWINGS/SUBMITTALS PRIOR TO STARTING ROUGH IN.
2. ALL FUSES SHALL BE DUAL ELEMENT, TIME DELAY. FINAL BREAKER/FUSE & DISCONNECT SIZE SHALL BE DETERMINED BY MANUFACTURER'S RECOMMENDATION ACTUAL EQUIPMENT INSTALLED.
3. ALL INSULATION ON CONDUCTORS TO BE THHN UNLESS NOTED OTHERWISE. INSULATION ON ALL UNDERGROUND EXTERIOR CONDUCTORS SHALL BE THHW.

GENERAL NOTES:

1. THE ELECTRICAL CONTRACTOR SHALL REVIEW AND COORDINATE WITH ARCHITECTURAL, CIVIL, STRUCTURAL, MECHANICAL, PLUMBING AND OTHER DRAWINGS PRIOR TO BID.
2. SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH THE SPECIFICATIONS BOUND IN A THREE RING BINDER, INDEXED IN A NEAT AND ORDERLY MANNER WITH TYPE AND MODEL NUMBERS INDICATED. SUBMITTALS SHALL INCLUDE BUT NOT LIMITED TO: LIGHTING FIXTURES, LAMPS, WIRING DEVICES, OCCUPANCY SENSORS, CONTACTORS, TIME CLOCKS, PHOTOCELLS, RELAYS, SWITCHBOARDS, PANELBOARDS, MOTOR CONTROL CENTERS, SAFETY SWITCHES, MOTOR STARTERS, OVERCURRENT PROTECTION DEVICES, TRANSFORMERS, CONDUCTORS OVER 600 VOLTS AND ALL SPECIAL SYSTEMS SUCH AS FIRE ALARM, LIGHTING CONTROLS, SECURITY SYSTEMS, SOUND SYSTEMS ETC.
3. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY. MANUFACTURES CATALOG NUMBERS ARE LISTED AS A BASIS OF DESIGN. ELECTRICAL CONTRACTOR SHALL SUBMIT PRODUCT INFORMATION THAT DEVIATES FROM ORIGINAL DESIGN INTENT AND SPECIFICATION.
4. CONTRACTOR SHALL SECURE AND PAY FOR ALL NECESSARY BUILDING PERMITS AND INSPECTION FEES.
5. ALL IMPACT FEES ASSOCIATED WITH CITY, UTILITY OR SERVICE COMPANIES FOR BUT NOT LIMITED TO POWER, TELEPHONE, FIBER OPTIC & INTERNET SHALL BE THE RESPONSIBILITY OF THE OWNER.
6. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH THE GENERAL CONTRACTOR TO PROVIDE AND INSTALL TEMPORARY POWER FOR PROJECT CONSTRUCTION AS REQUIRED. ALL ENERGY COSTS ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
7. THE ELECTRICAL CONTRACTOR SHALL NOTIFY AND COOPERATE WITH THE MECHANICAL CONTRACTOR SUCH THAT NO DUCTS, PIPING, OR EQUIPMENT FOREIGN TO THE OPERATION OF THE ELECTRICAL EQUIPMENT SHALL BE PERMITTED TO BE INSTALLED IN, ENTER, OR PASS THROUGH ELECTRICAL ROOMS OR SPACES, OR ABOVE OR BELOW ELECTRICAL EQUIPMENT IN OTHER AREAS. THE ELECTRICAL CONTRACTOR SHALL COMPLY WITH THE MOST RECENT VERSION OF THE NATIONAL ELECTRICAL CODE REGARDING CLEARANCES REQUIRED AROUND THE PANELBOARD(S).
8. DO NOT SCALE DRAWINGS VERIFY DIMENSIONS IN FIELD PRIOR TO MAKING ANY ROUGH-INS.
9. ELECTRICAL CONTRACTOR SHALL REVIEW ALL ARCHITECTS ELEVATIONS, SECTIONS AND FLOOR PLANS PRIOR TO ROUGH IN OF ELECTRICAL DEVICE JUNCTION BOXES.
10. ELECTRICAL CONTRACTOR SHALL MEET WITH THE CEILING AND MECHANICAL CONTRACTORS TO COORDINATE LOCATIONS, CLEARANCES, CEILING TYPES AND ROUGH-IN REQUIREMENTS OF ALL LIGHTING FIXTURES PRIOR TO DUCT, PIPING AND CEILING INSTALLATIONS.
11. VERIFY EXACT LOCATION(S) OF ALL EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN. REFER TO THE MECHANICAL SHEETS FOR THE EXACT LOCATION OF THE MECHANICAL EQUIPMENT.
12. ELECTRICAL CONTRACTOR SHALL VERIFY ALL EQUIPMENT DIMENSIONS AND LOCATIONS BEFORE BEGINNING ROUGH-INS. CONSULT CONTRACT DOCUMENT DRAWINGS AND SHOP DRAWINGS TO VERIFY AND MAINTAIN REQUIRED CLEARANCES.
13. ELECTRICAL ROOM DRAWINGS ARE FOR REFERENCE ONLY OF EQUIPMENT QUANTITIES. ELECTRICAL CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF ELECTRICAL ROOM SHOWING DIMENSIONS AND CLEARANCES OF ALL EQUIPMENT AND ELECTRICAL GEAR PROVIDED. COORDINATE LAYOUT WITH ONE-LINE DRAWINGS.
14. CONTRACTOR SHALL VERIFY ACTUAL ELECTRICAL LOADS FROM NAMEPLATE RATINGS OF EACH PIECE OF EQUIPMENT REQUIRING POWER. BRING ANY DISCREPANCIES TO THE ATTENTION OF THE PROJECT ENGINEER.
15. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER, PER INDUSTRY STANDARD AND TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER.
16. WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES, STANDARDS AND ORDINANCES.
17. FINAL CONNECTIONS TO EQUIPMENT SHALL BE MADE AS PER MANUFACTURERS WRITTEN INSTRUCTIONS AND APPROVED WIRING DIAGRAMS AND DETAILS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE ALL MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED.
18. ALL EMPTY RACEWAY SYSTEMS SHALL HAVE A 200lb RATED PULL CORD INSTALLED AND SHALL BE IDENTIFIED AT EACH JUNCTION, PULL AND TERMINATION POINT, USING PERMANENT MARKER IN THE BOX. ID SHALL INDICATE INTENDED USE OF CONDUIT, ORIGINATION AND TERMINATION POINTS OF EACH INDIVIDUAL CONDUIT.
19. ALL PENETRATIONS OF FIRE RATED FLOORS, CEILING AND WALLS SHALL BE SEALED WITH UL LISTED AND RATED FIRE STOP MATERIAL TO MAINTAIN FIRE RATING OF ASSEMBLY.
20. THE MINIMUM SIZE OF THE CONDUCTORS ARE TO BE #12 AWG THHN COPPER, UNLESS INDICATED OTHERWISE ON THE DRAWINGS. STRANDED CONDUCTORS ARE NOT ALLOWED IN CONDUCTORS SMALLER THAN #10 AWG.
21. DETAILS ARE SHOWN ON DIFFERENT SHEETS. THE CONTRACTOR SHALL REFER TO THOSE DETAILS WHETHER OR NOT CALLED IN REFERENCE NOTES.
22. ALL J-BOXES SHALL HAVE MINIMUM DEPTH OF 2½" UNLESS OTHERWISE SPECIFIED. SECURE ALL J-BOXES AS SHOWN IN THE DETAILS. FURNISH AND INSTALL PROPER PLASTER RINGS.
23. ALL NEW EXPOSED CONDUIT MUST RUN AGAINST THE WALLS OR CEILINGS. DO NOT PENDANT MOUNT ANY CONDUIT FROM THE CEILINGS.
24. COORDINATE WITH THE OWNER AND ARCHITECT FOR THE EXACT LOCATION OF THE OUTLETS.
25. LIGHT SWITCHES INSTALLED ADJACENT TO EACH OTHER, SHALL BE GANGED TOGETHER WITH ONE PIECE COVERPLATE.
26. USE EPOXY ANCHORS TO SUPPORT THE ELECTRICAL EQUIPMENT. EXPANSION ANCHOR BOLTS ARE NOT ACCEPTED.
27. AT THE END OF THE JOB, PROVIDE BLANK COVER PLATES TO MATCH THE OTHER COVER PLATES FOR ALL J-BOXES WHERE DEVICES HAVE NOT YET BEEN INSTALLED.
28. SEAL AROUND ALL CONDUIT PENETRATIONS THROUGH FIRE RATED WALLS AND CEILINGS WITH FIRE RATED MATERIAL. 3M IS AN APPROVED MANUFACTURER.
29. ALL MATERIALS USED IN THIS INSTALLATION SHALL BE U.L. APPROVED AND NEW.
30. FLEXIBLE CONDUITS CAN ONLY BE USED FOR SHORT RUNS (6'-0" MAXIMUM). FLEXIBLE CONDUITS LOCATED IN AIR PLENUMS SHALL NOT EXCEED 4'-0" IN LENGTH AS PER NATIONAL ELECTRICAL CODE 300.22(b).
31. NO CONDUITS SHALL RUN IN DUCT WORK.
32. PRIOR TO SUBMITTING A BID THE ELECTRICAL CONTRACTOR SHALL INSPECT THE SITE AND INCLUDE IN HIS BID PACKAGE ALL CHARGES DUE TO EXISTING CONDITIONS. SHOP DRAWINGS ARE REQUIRED.
33. THE ELECTRICAL CONTRACTOR SHALL TERMINATE THE ELECTRICAL CONNECTIONS TO ALL THE EQUIPMENT BY PROVIDING THE NECESSARY MALE/FEMALE CONNECTOR, RECEPTACLE, PLUG, ETC.
34. ALL DUPLEX OUTLETS AND SWITCHES SHALL BE 20 AMP, 120 VOLT SPEC GRADE. HUBBELL AND PASS & SEYMOUR AND LEVITON ARE APPROVED MANUFACTURERS.
35. ELECTRICAL BOXES SHALL NOT BE LOCATED IN MASONRY OR CONCRETE COLUMNS, BOND BEAMS OR GROUTED CELLS OF MASONRY WALLS ADJACENT TO OPENINGS WITHOUT COORDINATION WITH THE MASONRY CONTRACTOR.
36. MINIMUM SIZE OF CONDUIT TO BE ¾". ALUMINUM CONDUITS SHALL NOT BE USED, NO EXCEPTIONS TAKEN. USE RIGID STEEL SET SCREW TYPE FITTINGS ONLY. DIE CAST FITTINGS SHALL NOT BE USED.
37. WIRE FOR GENERAL USE SHALL BE COPPER 75° C RATED , WIRING FOR HID FIXTURES WITHIN 3" OF FLUORESCENT BALLAST SHALL BE COPPER, MINIMUM 90° C RATED. CONDUCTOR SIZES INDICATED ARE FOR INSTALLATION IN A MAXIMUM 30° C AMBIENT TEMPERATURE ENVIRONMENT. CONDUCTOR AMPACITY SHALL BE DERATED FOR HIGHER AMBIENT INSTALLATIONS.
38. ELECTRICAL CONTRACTOR TO COMPLY WITH 210.4(b) OF THE NATIONAL ELECTRICAL CODE FOR MULTIWIRE BRANCH CIRCUITS, NOT MORE THAN THREE (3) CIRCUITS TOTAL SHALL BE INSTALLED IN A CONDUIT. BRANCH CIRCUITS SHALL HAVE CONDUCTORS CONSISTENT WITH THE FOLLOWING TABLE:

# CIRCUITS	ϕ WIRE(S)	NEUTRAL	GROUND	TOTAL
3	3	3	1	7
2	2	2	1	5
1	1	1	1	3

CONDUCTORS SHALL BE DERATED AS PER NATIONAL ELECTRICAL CODE, TABLE 310.15(B)(2)(a). PROVIDE AND INSTALL A GROUNDING CONDUCTOR (AS PER NATIONAL ELECTRICAL CODE, ARTICLE 250) IN ALL BRANCH CIRCUIT AND FEEDER RUNS REGARDLESS OF CONDUIT TYPE. CONDUIT ONLY GROUNDING IS NOT ACCEPTABLE. NO EXCEPTIONS TAKEN.

39. CONDUCTORS HAVE BEEN SIZED FOR VOLTAGE DROP AS PER PLANS AND DIRECT ROUTING. ANY DEVIATION IN CONDUIT ROUTING MAY INCREASE THE WIRE AND CONDUIT SIZE. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO INSURE PROPER OPERATING VOLTAGE ON ALL CIRCUITS BOTH INTERIOR AND EXTERIOR. THE VOLTAGE DROP SHALL NOT EXCEED 3% FOR BRANCH CIRCUITS AND 2% FOR FEEDERS FOR A TOTAL OF 5% COMBINED TOGETHER OF BRANCH AND FEEDER CIRCUITS TO THE FARTHEST OUTLET.
40. THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL ELECTRICAL LOADS (VOLTAGE, PHASE, CONNECTION REQUIREMENT, ETC.) OF EQUIPMENT FURNISHED UNDER OTHER DIVISIONS WITH APPROVED SHOP DRAWINGS PRIOR TO BEGINNING ROUGH-IN.
41. THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING OF ANY DISCREPANCIES FOUND BETWEEN THE INTENDED FUNCTION OF EQUIPMENT AND EQUIPMENT SPECIFIED IN THE CONTRACT DOCUMENTS, A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO ISSUANCE OF THE FINAL BID. FAILURE TO REPORT ANY DISCREPANCY (CATALOG NUMBERS, DISCONTINUED ITEMS, ETC.) DOES NOT RELIEVE THE CONTRACTOR FROM PROVIDING EQUIPMENT WHICH SHALL CONFORM TO AND FULFILL THE INTENT OF THE CONTRACT DOCUMENTS, NOR SHALL IT BE USED AS A CONDITION TO OBTAIN ADDITIONAL FUNDS FROM THE OWNER AFTER THE CONTRACT IS AWARDED. THE CONTRACTOR SHALL REQUEST ALL CLARIFICATIONS OF CONTRACT DOCUMENT REQUIREMENTS IN WRITING TO THE ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO ISSUANCE OF THE FINAL ADDENDUM.
42. ALL VOICE/DATA OUTLET LOCATIONS WILL BE A 4" SQUARE x 2⅛" DEEP OUTLET BOX WITH A SINGLE GANG PLASTER RING, EXTEND A ¾" CONDUIT INTO ACCESSIBLE CEILING SPACE FOR FUTURE EXTENSION BY OWNER. INSTALL 200lb NYLON PULL CORD IN EACH CONDUIT.
43. PROVIDE TYPED LABEL FOR ALL DUPLEX OUTLETS, VOICE/DATA AND LIGHT SWITCHES TO INDICATE WHICH CIRCUIT THEY ARE TIED TO.
44. ELECTRICAL CONTRACTOR SHALL TEST AND VERIFY ALL SYSTEMS WITH PROJECT ENGINEER DURING FINAL INSPECTION TO INSURE PROPER OPERATION. IF TESTS RESULT IN DEFECT THE CONTRACTOR SHALL MAKE ANY CORRECTIONS NECESSARY AT NO ADDITIONAL COSTS TO THE OWNER.
45. ELECTRICAL CONTRACTOR TO PROVIDE RECORD ("AS CONSTRUCTED") DRAWINGS TO THE ENGINEER AT THE END OF THE PROJECT. DRAWINGS SHALL BE IN THE LATEST VERSION OF AUTOCAD DRAWING (.DWG) FORMAT. ELECTRICAL CONTRACTOR SHALL PROVIDE SHOP DRAWING SUBMITTALS FOR ALL EQUIPMENT, PANELBOARDS, LIGHTING FIXTURES, DEVICES, AUXILIARY SYSTEMS, ETC. THAT ARE USED ON THE PROJECT.
46. ALL LABOR, MATERIAL AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF 1 YEAR FROM THE DATE OF ACCEPTANCE BY THE TENANT. REPLACE OR REPAIR ALL DEFECTS DURING THE GUARANTEED PERIOD. DEFECTS SHALL BE PROMPTLY CORRECTED.

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DESIGNED BY: KJH
CHECKED BY: SRG
ROYAL ENGINEERING PROJECT NO. #11245.00
DATE PLOTTED: 27.01.2012

REVISIONS:	DATE:	KSB No.
	12-18-2011	11-029

GUEST HOGANS
for N.A.T.I.V.E.
KAYENTA, ARIZONA 86033
ELECTRICAL LEGEND SYMBOLS AND GENERAL NOTES

E3.1

GENERAL NOTES:

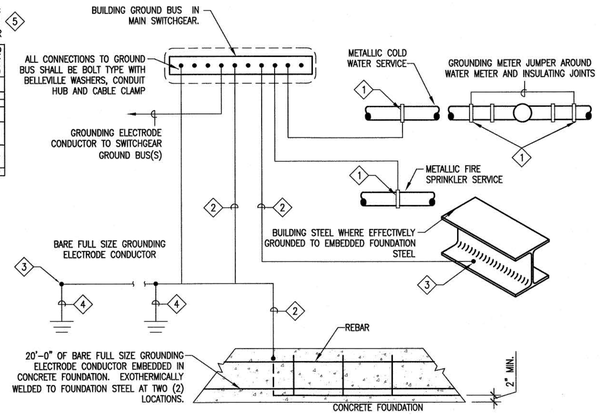
1. WHEN AVAILABLE CONTRACTOR SHALL PROVIDE ALL GROUNDING MEANS INDICATED. CONTRACTOR SHALL REFER TO ELECTRICAL ONE-LINE DIAGRAM AND GROUNDING ELECTRODE CONDUCTOR SCHEDULE (THIS DETAIL) FOR GROUNDING ELECTRODE CONDUCTOR SIZE. CONTRACTOR SHALL REFER TO ELECTRICAL SPECIFICATIONS FOR SPECIFICS OF GROUNDING SYSTEM INSTALLATION AND MATERIALS.
2. IF APPLICABLE THE GROUNDING ROD SHALL BE MINIMUM OF 9'-0" AWAY FROM IRRIGATION CONTROLLER.

KEYED NOTES:

1. T&B 3900 BU GROUND CLAMP WITH 3/4" CONDUIT HUB AND CABLE CLAMP
2. FULL SIZE GROUNDING ELECTRODE CONDUCTOR IN GRC.
3. EXOTHERMICALLY WELDED (TYPICAL)
4. DRIVEN GROUND RODS ⅝"x96" COPPER/SHEET ON BUILDING EXTERIOR
5. TABLE TAKEN FROM NEC 250.66. UNGROUNDED PHASE CONDUCTOR REFERS TO THE SIZE OF THE LARGEST UNGROUNDED SERVICE-ENTRANCE CONDUCTOR OR EQUIVALENT AREA FOR PARALLEL CONDUCTORS. SEE NEC 250.66.

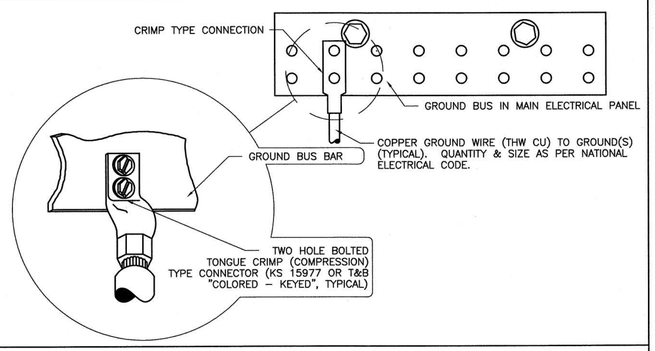
GROUNDING ELECTRODE CONDUCTOR (5)

UNGROUNDED CONDUCTOR (COPPER)	GRND WIRE SIZE (CU)
#2 OR SMALLER	#8
1 OR 1/0	#6
2/0 OR 3/0	#4
>3/0 THRU 250 KCMIL	#2
>250 KCMIL THRU 600 KCMIL	1/0
>600 KCMIL THRU 1100 KCMIL	2/0
>1100 KCMIL	3/0



SERVICE GROUNDING DETAIL

SCALE: NTS



SERVICE BUS GROUNDING DETAIL

SCALE: NTS

IF PANELBOARD IS FEED FROM A TRANSFORMER LOCATED IN THE SAME ROOM AS THE PANEL. THE TOTAL LENGTH OF THE BRANCH CIRCUITS SHALL NOT EXCEED THE FOLLOWING:

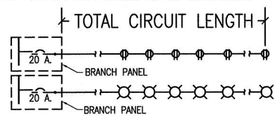
	120 VOLTS	277 VOLTS
a- USING #12 AWG	90 FT.	180 FT.
b- USING #10 AWG	150 FT.	300 FT.
c- USING #8 AWG	250 FT.	450 FT.
d- USING #6 AWG	380 FT.	700 FT.

THE ABOVE CIRCUIT LENGTHS ARE BASED ON 4% VOLTAGE DROP AT 16 AMPS LOAD AT THE END OF THE CIRCUIT. SAME WIRE SIZE SHALL BE USED FOR THE ENTIRE CIRCUIT.

IF PANELBOARD IS FEED FROM A TRANSFORMER LOCATED REMOTLY FROM THE PANEL. THE TOTAL LENGTH OF THE BRANCH CIRCUITS SHALL NOT EXCEED THE FOLLOWING:

	120 VOLTS	277 VOLTS
a- USING #12 AWG	75 FT.	180 FT.
b- USING #10 AWG	125 FT.	260 FT.
c- USING #8 AWG	205 FT.	420 FT.
d- USING #6 AWG	325 FT.	660 FT.

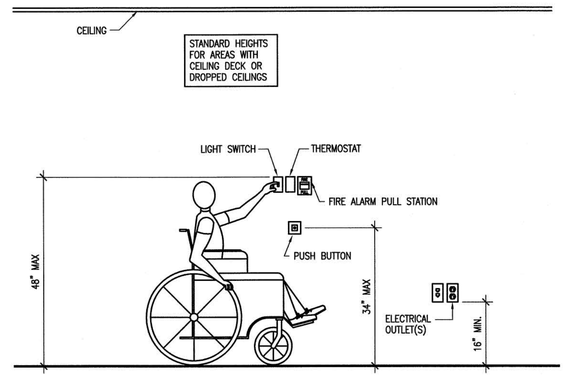
THE ABOVE CIRCUIT LENGTHS ARE BASED ON 3% VOLTAGE DROP AT 16 AMPS LOAD AT THE END OF THE CIRCUIT. SAME WIRE SIZE SHALL BE USED FOR THE ENTIRE CIRCUIT.



BRANCH CIRCUIT DEFINITION:
CIRCUIT ORIGINATING FROM A 20 AMP CIRCUIT BREAKER IN A BRANCH PANEL AND ENDING AT THE LAST DUPLEX OUTLET ON THE CIRCUIT OR ENDS AT THE LAST LIGHT FIXTURE.

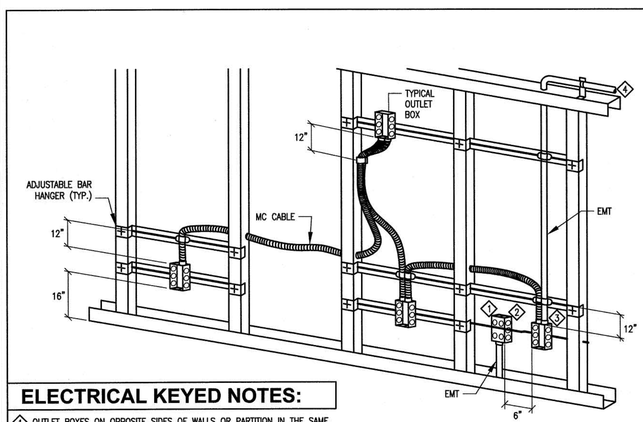
BRANCH CIRCUIT VOLTAGE DROP DETAIL

SCALE: NTS



HANDICAPPED MOUNTING HEIGHTS DETAIL

SCALE: NTS



ELECTRICAL KEYED NOTES:

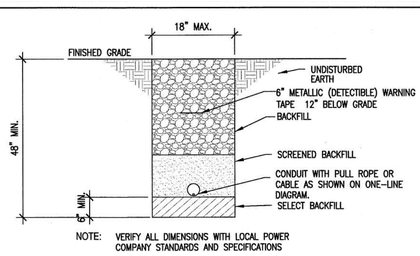
1. OUTLET BOXES ON OPPOSITE SIDES OF WALLS OR PARTITION IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 6" HORIZONTAL DISTANCE.
2. ELECTRICAL BOXES INSTALLED IN FIRE RESISTANT WALLS OR PARTITIONS SHALL COMPLY WITH IBC 712.3.2 (24" SEPARATION ON OPPOSITE SIDES.)
3. INSULATED THROAT EMT CONNECTOR.
4. HOME RUN TO PANEL MUST BE IN RACEWAY.

ELECTRICAL GENERAL NOTES:

1. TYPICAL FOR WOOD AND METAL STUD ROUGH IN.
2. PLASTER RINGS NOT SHOWN. COORDINATE RING DEPTH TO BE FLUSH WITH FINAL FINISH SURFACE.
3. LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.

TYPICAL ROUGH-IN REQUIREMENTS DETAIL FOR MC CABLE

SCALE: NTS



NOTE: VERIFY ALL DIMENSIONS WITH LOCAL POWER COMPANY STANDARDS AND SPECIFICATIONS

TRENCHING DETAIL

SCALE: NTS

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DATE	JOB NO	
12-18-2012	11-029	

DESIGNED BY: K.H
CHECKED BY: SRG
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DATE PLOTTED: 27.01.2012

GUEST HOGANS
For N.A.T.I.V.E.
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ELECTRICAL DETAILS

E4.1

ELECTRICAL SPECIFICATIONS

GENERAL PROVISION

A. REFERENCE
   1. THE GENERAL CONDITIONS AND OTHER CONTRACT DRAWINGS AS SET FORTH IN THE FOREGOING PAGES ARE HEREBY INCORPORATED INTO AND BECOME A PART OF THE SPECIFICATIONS FOR WORK UNDER THIS TITLE, INSOFAR AS THEY APPLY HERETO.
   2. ALL SPECIFICATIONS UNDER THIS DIVISION TITLE ARE DIRECTED TO AND ARE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, UNLESS OTHER TRADES OR PERSONS ARE SPECIFICALLY MENTIONED, "ELECTRICAL CONTRACTOR" IS INFERRED AND INTENDED.

B. CONTRACT DRAWINGS
   1. THE DRAWINGS ACCOMPANYING THESE SPECIFICATIONS ARE COMPLEMENTARY EACH TO THE OTHER AND WHAT IS CALLED FOR BY ONE SHALL BE AS IF CALLED FOR BY BOTH.
   2. CONSULT ALL CONTRACT DRAWINGS WHICH MAY AFFECT THE LOCATION OF EQUIPMENT, CONDUIT AND WIRING AND MAKE MINOR ADJUSTMENTS IN LOCATION TO SECURE COORDINATION.
   3. WIRING LAYOUT IS SCHEMATIC AND EXACT LOCATIONS SHALL BE DETERMINED BY FIELD CONDITIONS.
   4. OTHER THAN MINOR ADJUSTMENTS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE PROCEEDING WITH THE WORK.

C. JOB-SITE COPY OF DOCUMENTS
   1. MAINTAIN AT THE SITE, ONE COPY OF ALL DRAWINGS, SPECIFICATIONS, ADDENDA APPROVED SHOP DRAWINGS, CHANGE ORDERS AND OTHER MODIFICATIONS, IN GOOD ORDER AND MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION. THESE SHALL BE AVAILABLE TO THE OWNER'S REPRESENTATIVE. THE DRAWINGS MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION SHALL BE DELIVERED TO THE OWNER'S REPRESENTATIVE FOR THE OWNER UPON COMPLETION OF THE WORK. AN ADDITIONAL SET OF DRAWINGS WILL BE FURNISHED BY THE OWNER'S REPRESENTATIVE FOR THIS PURPOSE UPON REQUEST.

D. MANUFACTURER'S DRAWINGS
   1. THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR REVIEW, (6) COPIES OF MANUFACTURER'S DRAWINGS AND WIRING DIAGRAMS. THE ENGINEER WILL REVIEW CONTRACTOR'S SHOP DRAWINGS AND RELATED SUBMITTALS (AS INDICATED BELOW) WITH RESPECT TO THE ABILITY OF THE DETAILED WORK, WHEN COMPLETE, TO BE A PROPERLY FUNCTIONING INTEGRAL ELEMENT OF THE OVERALL SYSTEM DESIGNED BY THE ENGINEER. BEFORE SUBMITTING A SHOP DRAWING OR ANY RELATED MATERIAL TO THE ENGINEER, CONTRACTOR SHALL: REVIEW EACH SUCH SUBMISSION FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND OPERATIONS OF CONSTRUCTION, AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF CONTRACTOR: APPROVE EACH SUCH SUBMISSION BEFORE SUBMITTING IT; AND SO STAMP EACH SUCH SUBMISSION BEFORE SUBMITTING IT. THE ENGINEER SHALL ASSUME THAT NO SHOP DRAWING OR RELATED SUBMITTAL COMPRISES A VARIATION UNLESS CONTRACTOR ADVISES ENGINEER OTHERWISE VIA A WRITTEN INSTRUMENT WHICH IS ACKNOWLEDGED BY ENGINEER IN WRITING. THE ITEMS, TYPES OF SUBMITTALS AND RELATED MATERIAL (IF ANY) CALLED FOR ARE INDICATED BELOW:

ITEMS	TYPE SUBMITTALS REQUESTED
LIGHTING AND POWER PANELS	SHOP DRAWINGS
LIGHTING FIXTURES	CATALOG CUTS

E. GUARANTEES
   1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEFECTS, REPAIRS AND REPLACEMENTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF SUBSTANTIAL COMPLETION AS DETERMINED BY THE OWNER'S REPRESENTATIVE. PRODUCT GUARANTEES GREATER THAN ONE (1) YEAR SHALL BE PASSED ALONG TO THE OWNER FOR FULL BENEFIT OF THE MANUFACTURER'S WARRANTY.

WORK INCLUDED

A. INSTALLATION, MATERIALS, AND WORKMANSHIP
   1. FURNISH AND INSTALL ALL NECESSARY ANCHORS, SUPPORTS, STRAPS, BOXES, FITTINGS AND OTHER SIMILAR APPURTENANCES NOT INDICATED ON THE DRAWINGS BUT WHICH ARE REQUIRED FOR A COMPLETE AND PROPERLY INSTALLED SYSTEM CONSISTENT WITH THE ARCHITECTURAL TREATMENT OF THE BUILDING.
   2. THE ELECTRICAL CONTRACTOR, INSOFAR AS THE WORK IS CONCERNED, SHALL AT ALL TIMES KEEP THE PREMISES IN A NEAT AND ORDERLY CONDITION. AND AT THE COMPLETION OF THE WORK, SHALL PROPERLY CLEAN UP AND CART AWAY DEBRIS AND EXCESS MATERIALS. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF DUMPSTER & REFUSED DISPOSAL AS REQUIRED FOR ELECTRICAL WORK.
   3. ALL MATERIALS SHALL BE NEW AND UNDETERIORATED AND OF A QUALITY NOT LESS THAN THE MINIMUM SPECIFIED.

B. COORDINATION OF PLANS AND SPECIFICATIONS
   1. CONTACT THE OWNER'S REPRESENTATIVE IMMEDIATELY IF THERE IS ANY QUESTIONS REGARDING THE MEANING OR INTENT OF EITHER PLANS OR SPECIFICATIONS, OR UPON NOTICING ANY DISCREPANCIES OR OMISSIONS IN EITHER PLANS OR SPECIFICATIONS.

C. CUTTING AND PATCHING
   1. ALL ELECTRICAL EQUIPMENT SHALL BE KEPT DRY AND CLEAN DURING THE CONSTRUCTION PERIOD. INTERIOR OF ALL ENCLOSURES SHALL BE CLEANED OF DIRT AND DEBRIS BEFORE INSTALLING TRIM OR COVERS.
   2. ALL FINISHED SURFACES OF EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE THOROUGHLY CLEANED OF DIRT AND ALL SCRATCHED OR DAMAGED SURFACES SHALL BE TOUCHED UP WITH MATCHING MATERIALS BEFORE FINAL ACCEPTANCE OF THE WORK.
   3. WHEN ALL WORK IS COMPLETED AND ALL WORK HAS BEEN SATISFACTORILY TESTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE, ALL CONDUIT AND OTHER EXPOSED SURFACES SHALL BE THOROUGHLY CLEANED.

CODES AND FEES

A. CODES:
   1. ALL WORK PERFORMED UNDER THIS SPECIFICATION SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AS PREPARED AND PUBLISHED BY THE NATIONAL FIRE PROTECTION ASSOCIATION AND ANY APPLICABLE STATE OR LOCAL CODES.

B. FEES:
   1. OBTAIN AND PAY FOR ANY AND ALL PERMITS REQUIRED BY ALL LAWS AND REGULATIONS AND PUBLIC AUTHORITY HAVING SUCH JURISDICTION.

TESTS AND INSPECTIONS

A. OBTAIN ALL INSPECTIONS REQUIRED BY ALL LAWS, ORDINANCES, RULES, REGULATIONS OR PUBLIC AUTHORITY HAVING JURISDICTION AND OBTAIN CERTIFICATES OF SUCH INSPECTIONS AND SUBMIT SAME TO THE OWNER'S REPRESENTATIVE. PAY ALL FEES, CHARGES AND OTHER EXPENSES IN CONNECTION THEREIN. OBTAIN OCCUPANCY PERMIT AS REQUIRED BY OWNER. FINAL PAYMENT SHALL NOT BE MADE UNTIL OCCUPANCY PERMIT IS OBTAINED.
B. WORK SHALL BE UNACCEPTABLE WHEN FOUND TO BE DEFECTIVE OR CONTRARY TO THE PLANS SPECIFICATIONS, CODES SPECIFIED OR ACCEPTED STANDARDS OF GOOD WORKMANSHIP.
C. THE CONTRACTOR SHALL PROMPTLY CORRECT ALL WORK FOUND UNACCEPTABLE BY THE OWNER'S REPRESENTATIVE WHETHER OBSERVED BEFORE OR AFTER SUBSTANTIAL COMPLETION AND WHETHER OR NOT FABRICATED, INSTALLED OR COMPLETED. THE CONTRACTOR SHALL BEAR ALL COSTS OF CORRECTING SUCH UNACCEPTABLE WORK, INCLUDING COMPENSATION FOR THE OWNERS REPRESENTATIVE ADDITIONAL SERVICES MADE NECESSARY THEREBY.

CONDUIT

A. FURNISH AND INSTALL ALL CONDUITS, BOXES, FITTINGS, ETC., FOR A COMPLETE RACEWAY SYSTEM.
B. ALL WIRING SHALL BE RUN IN EMT CONDUIT OR MC CABLE WITH GROUND CONDUCTOR UNLESS OTHERWISE NOTED.
C. ALL CONDUIT SIZES STATED HEREIN OR MARKED ON THE DRAWINGS ARE MINIMUM SIZE AND SHALL BE NO LESS THAN ½" UNLESS OTHERWISE NOTED.
D. ALL CONDUIT SHALL BE SUBSTANTIALLY SUPPORTED BY PIPE STRAPS OR SUITABLE CLAMPS OR HANGERS ATTACHED TO THE ELEMENTS OF THE BUILDING STRUCTURE TO PROVIDE RIGID INSTALLATION; IN NO CASE SHALL CONDUIT BE ATTACHED OR SUPPORTED FROM ADJOINING PIPE OR INSTALLED IN SUCH A MANNER AS TO PREVENT THE READY REMOVAL OF OTHER PIPE FOR REPAIRS.

WIRE AND CABLE

A. ALL CONDUCTORS SHALL BE COPPER AND OF THE AWG SIZE AND TYPE SHOWN ON THE DRAWINGS. WHERE NO SIZE OR TYPE IS SHOWN. CONDUCTORS SHALL NOT BE LESS THAN #12 TYPE XHHW, THHN, OR THWN. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED COPPER AND HAVE 600 VOLT INSULATION; BE UL LABELED AND OF AMERICAN MANUFACTURER.
B. ALL CONNECTIONS ARE TO BE MADE USING PRESSURE TYPE TERMINALS.
C. THE FOLLOWING COLOR CODE SHALL BE USED:

	120/240 VOLT	120/208 VOLT	277/480 VOLT
PHASE A	BLACK	BLACK	BROWN
PHASE B	RED	RED	ORANGE
PHASE C		BLUE	YELLOW
NEUTRAL	WHITE	WHITE	WHITE
GROUND	GREEN	GREEN	GREEN

D. CONDUCTORS NO. 10 AWG OR SMALLER SHALL HAVE INSULATION COLORED AS NOTED ABOVE.
E. CONDUCTORS NO. 8 AWG OR LARGER SHALL HAVE INSULATION COLORED AS NOTED ABOVE OR COLORED TAPE, MINIMUM SIZE ½", WRAPPED TWICE AROUND AT THE FOLLOWING POINTS:
   1. AT EACH TERMINAL
   2. AT EACH CONDUIT ENTRANCE
   3. AT INTERVALS NOT MORE THAN 12 INCHES APART IN ALL BOXES, PANEL TUBS, SWITCHBOARDS, ETC
F. ALL BRANCH CIRCUITS SHALL BE MARKED IN THE PANEL BOARD GUTTERS. MARKERS SHALL INDICATE CORRESPONDING BRANCH---CIRCUIT NUMBERS.
G. EACH BRANCH CIRCUIT REQUIRING A NEUTRAL SHALL BE FURNISHED WITH A SEPARATE INDIVIDUAL NEUTRAL CONDUCTOR.

BOXES AND PLATES

A. FURNISH AND INSTALL ALL OUTLET, JUNCTION, AND PULL BOXES AS INDICATED ON THE DRAWINGS AND AS NECESSARY TO INSTALL THE REQUIRED CONDUIT AND WIRING IN A NEAT AND WORKMANLIKE MANNER.
B. PULL BOXES AND JUNCTION BOXES SHALL BE GALVANIZED AND OF THE CORRECT SIZE AND GAUGE, SIZED IN ACCORDANCE WITH CODE REQUIREMENTS AND SHALL BE U.L. LABELED.
C. BOXES AT EXTERIOR AREAS TO BE WATERTIGHT AND DUST-TIGHT WITH GASKETED COVERS.
D. ALL BOXES FOR EXPOSED WORK IN FINISHED SPACES SHALL BE "FS" TYPE WITH THREADED HUBS WITH RIGID CONDUIT RISER (DEEP WIRE MOLD BOXES)
E. ALL BOXES SHALL BE RIGIDLY SUPPORTED INDEPENDENT OF THE CONDUIT SYSTEM. BOXES CAST INTO MASONRY OR CONCRETE ARE CONSIDERED TO BE RIGIDLY SUPPORTED.

WIRING DEVICES

A. WIRING DEVICES SHALL BE SIMILAR TO THOSE LISTED BELOW AND OF SPECIFIED AMPERAGE. OTHER SPECIAL PURPOSE DEVICES SHALL BE AS SPECIFIED ON THE DRAWINGS.
B. DUPLEX GROUNDING TYPE RECEPTACLE---20 AMP, 125 VOLT---
   1. HUBBELL---5352
   2. ARROW HART---5352
C. SINGLE POLE SWITCHES - 20 AMP, 120 VOLT
D. WEATHERPROOF RECEPTACLES - 20 AMP, 125 VOLT---NEMA 5---20R
   1. HUBBELL---5352 WITH 5205 COVER 'INTERMATIC GUARDIAN
   2. I SERIES, NEMA 3R COVER
   3. ARROW HART---5352 WITH 4500 COVER
E. G.F.C.I. RECEPTACLE- 20 AMP, 125 VOLT---NEMA 5-20 R
   1. HUBBELL- GF 5262 WITH MATCHING NYLON COVER PLATE OR WO-26 W.P. COVER
F. GROUND ALL RECEPTACLES IN ACCORDANCE WITH ARTICLE 250-146 OF NEC AND AS INDICATED IN THE GROUNDING SECTION OF THIS SPECIFICATION.

IDENTIFICATION

A. EACH PIECE OF SERVICE EQUIPMENT AND INDIVIDUAL SWITCHES, ALL DISCONNECTS, STARTERS, ALL EXHAUST FAN MANUAL STARTING SWITCHES.
B. IDENTIFICATION SHALL BE IN THE FORM OF LAMINATED PLASTIC NAMEPLATES, BLACK RACE, WITH THE LETTERS ENGRAVED INTO THE WHITE BACKGROUND, MINIMUM ¼" HIGH. PLATES SHALL BE DRILLED ON EACH END FOR SHEET METAL SCREW ATTACHMENT. NO "DYMO" OR SIMILAR TYPE LABELS WILL BE ALLOWED.
C. PANEL BOARD DIRECTORY: A TYPED CIRCUIT DIRECTORY SHALL BE PROVIDED INDICATING LOCAL AREA SERVED AND LOCATION FOR EACH BRANCH CIRCUIT.

GROUNDING

A. ALL FEEDERS AND BRANCH CIRCUITS OVER 100 VOLTS SHALL INCLUDE A GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NEC TABLE 250-122, EXCEPT NOT BE SMALLER THAN #12 FOR POWER AND LIGHTING CIRCUITS AND #14 FOR CONTROL CIRCUITS. ALL GROUND CONDUCTORS SHALL BE GREEN, OR AS SPECIFIED UNDER SECTION 16120, 'WIRE AND CABLE'.
B. ALL GROUND CLAMPS SHALL BE PENN-UNION 'GPL' TYPE OR SIMILAR BY O.Z. OR BURNDY.
C. CONDUIT FOR SOLITARY GROUND CONDUCTORS SHALL BE RIGID SCHEDULE 40 PVC NON- METALLIC ELECTRICAL CONDUIT WITH U.L. LABEL SOLITARY GROUND CONDUCTORS SHALL NOT BE PLACED THROUGH METALLIC SLEEVES OR CONDUITS AND SHALL NOT BE COMPLETELY ENCIRCLED BY METALLIC HANGERS OR SUPPORTS.
D. THE GROUND CONDUCTOR SHALL BE CONNECTED TO THE NEUTRAL IN ONLY TWO LOCATIONS -ON THE SUPPLY SIDE OF THE SERVICE DISCONNECT MEANS PER NEC---250---24 AND ON SEPARATELY DERIVED SYSTEMS PER NEC 250-30.
E. AT EACH RECEPTACLE BOX, THE GROUND CONDUCTOR SHALL ENTER AND CONNECT, WITH NORMAL WIRING CONNECTOR, TO: 1) THE GROUND PIGTAIL TO RECEPTACLE: 2) THE GROUND PIGTAIL TO THE BOX GROUND SCREW; AND 3) THE OUTGOING GROUND CONDUCTOR TO NEXT DEVICE, IF NOT AT END OF RUN. METAL TO METAL CONTACT BETWEEN THE DEVICE YOKE AND THE OUTLET BOX IS NOT ACCEPTABLE AS A BOND FOR EITHER SURFACE. MOUNTED BOXES OR FLUSH TYPE BOXES.
F. CONDUIT SYSTEM SHALL BE ELECTRICALLY CONTINUOUS. ALL LOCK NUTS SHALL CUT THROUGH ENAMELED OR PAINTED SURFACES ON ENCLOSURES. WHERE ENCLOSURES AND NON-CURRENT CARRYING METALS ARE ISOLATED FROM THE CONDUIT SYSTEM, USE BONDING JUMPERS WITH APPROVED CLAMPS. WHERE REDUCING WASHERS ARE USED AND WHERE CONCENTRIC OR ECCENTRIC KNOCKOUTS ARE NOT COMPLETELY REMOVED BONDING BUSHINGS SHALL BE REQUIRED.

LIGHTING FIXTURES

A. CONTRACTOR SHALL FURNISH AND INSTALL LIGHTING FIXTURES AND LAMPS AS INDICATED IN FIXTURE SCHEDULE SHOWN ON DRAWINGS, AND SPECIFIED HEREIN.
B. NEUTRAL ASSEMBLY SHALL HAVE INDIVIDUAL ANTI-TURN SOLDERLESS TERMINALS, SIMILAR TO SQUARE D TYPE PK, FOR CONNECTION OF ULTIMATE NUMBER OF NEUTRAL WIRES. SHEET METAL TERMINAL STRIPS AND CONNECTIONS WILL BE REJECTED.
C. ALL LAMP HOLDERS INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL BE FURNISHED COMPLETE WITH NEW LAMPS OF THE SIZE INDICATING ON THE FIXTURE SCHEDULE.
D. LAMP CURRENT CREST FACTOR SHALL NOT EXCEED 1.8 AND SHALL BE COMPATIBLE WITH BALLAST BEING UTILIZED.
E. ANY FIXTURES SCRATCHED, BENT, CRACKED OR IN ANY WAY DAMAGED BEFORE ACCEPTANCE BY OWNER SHALL BE REPLACED AT THIS CONTRACTOR'S EXPENSE.
F. ALL LAMPS SHALL BE IN WORKING ORDER AT THE TIME OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER.
G. ALL LIGHTING FIXTURES ARE TO BE GROUNDED ON THE INTERIOR OF THE FIXTURE HOUSING, ON CLEAN BARE METAL (FREE OF PAINT). BY USE OF PIGTAIL AND FASTENED BY A SCREW USED FOR NO OTHER PURPOSE.
H. FLUORESCENT FIXTURES SHALL COMPLY WITH 2008 NEC 410.73G (BALLAST DISCONNECT MEANS FOR DOUBLE ENDED LAMPS).

POWER AND LIGHTING PANELS

A. FURNISH AND INSTALL, AS SCHEDULED AND SHOWN ON THE DRAWINGS, POWER PANELS FOR OPERATION ON VOLTAGES INDICATED.
B. ALL TERMINATIONS SHALL BE MARKED '75'C ONLY', '60/75' C' OR LISTED FOR USE OF 75' C INSULATED CONDUCTORS AT FULL 75' C AMPACITY.
C. ALL BUS BARS SHALL BE SILVER OR TIN PLATED COPPER.
D. CABINETS SHALL BE OF COMMERCIAL GALVANIZED SHEET STEEL, CODE GAUGE AND SIZE, SURFACE OR RECESSED MOUNTED AS CALLED FOR IN THE DRAWINGS.
E. NEUTRAL ASSEMBLY SHALL HAVE INDIVIDUAL ANTI-TURN SOLDERLESS TERMINALS, SIMILAR TO SQUARE D TYPE PK, FOR CONNECTION OF ULTIMATE NUMBER OF NEUTRAL WIRES. SHEET METAL TERMINAL STRIPS AND CONNECTIONS WILL BE REJECTED.
F. PANEL SHALL HAVE A COPPER GROUND BAR SIMILAR TO NEUTRAL BAR IN NUMBER, SIZE, AND TYPE OF ANTI-TURN SOLDERLESS LUGS. THIS GROUND BAR SHALL BE FACTORY BONDED TO THE PANEL TUB IN THE GUTTER SPACE OPPOSITE THE MAINS AND THE NEUTRAL ASSEMBLY AND SHALL HAVE THE SCREWDRIVER SLOTS FACING THE FRONT OF THE PANEL.
G. QUALITY STANDARD: SQUARE D TYPE NQOD

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CHECKED BY: SRG
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Registered Professional Engineer (Electrical) CERTIFICATE NO. 37662 STEVEN R. GRIFFITHS Date Signed 1/27/12 ARIZONA U.S.A.
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