

ELECTRICAL SPECIFICATIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

THE GENERAL DOCUMENTS APPLY TO WORK SPECIFIED IN THIS SECTION. CONSULT THEM IN DETAIL FOR APPLICABLE INSTRUCTIONS.

1.02 WORK INCLUDED

PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE ALL WORK OF THIS SECTION WITHOUT RESTRICTING THE GENERALITY OF THE FOREGOING, THE FOLLOWING ITEMS OF WORK ARE INCLUDED:

- A. PERMITS AND FEES
- B. TEMPORARY POWER AND LIGHT
- C. SERVICE PROVISIONS AND METERBANKS
- D. PANELBOARDS
- E. TELEPHONE PROVISIONS
- F. RACEWAYS
- G. BOXES
- H. WIRING
- I. GROUNDING
- J. LIGHTING FIXTURES AND LAMPS
- K. WIRING DEVICES AND PLATES
- L. CONNECTIONS TO EQUIPMENT
- M. DIRECTORIES AND NAMEPLATES
- N. TESTING
- O. CLEANING AND REMOVAL OF RUBBISH
- P. SUBMITTALS

IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF CONSTRUCTION. THE CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS NECESSARY FOR EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.

1.03 RELATED WORK OF OTHER SECTIONS

- A. CONCRETE AND MASONRY
- B. PAINTING

1.04 QUALITY ASSURANCE

A. USE ADEQUATE NUMBERS OF SKILLED WORKMEN WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND THE METHODS NEEDED FOR THE PROPER PERFORMANCE OF THE WORK OF THIS SECTION.

B. ALL WORK SHALL BE OF THE HIGHEST QUALITY IN CONFORMANCE WITH THE BEST PRACTICES OF THE TRADE AND IN COMPLIANCE WITH ALL GOVERNING CODES.

1.05 CODES, PERMITS, FEES, AND REGULATIONS

A. ALL WORK SHALL BE CARRIED OUT IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE NATIONAL ELECTRICAL CODE, LATEST EDITION, AND OF THE VARIOUS LOCAL AGENCIES HAVING JURISDICTION.

B. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS AND PAY ALL GOVERNMENTAL TAXES, FEES, DEPOSITS AND OTHER COSTS IN CONNECTION WITH HIS WORK; FILE ALL NECESSARY PLANS, PREPARE ALL DOCUMENTS AND OBTAIN NECESSARY APPROVALS OF ALL AGENCIES HAVING JURISDICTION; OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION AND APPROVALS FOR HIS WORK AND DELIVER SAME TO THE ARCHITECT BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.

1.06 STORAGE OF MATERIALS

A. STORE MATERIALS AND EQUIPMENT ON THE PREMISES WHERE DIRECTED BY THE OWNER.

1.07 OTHER TRADES

A. BIDDERS SHALL EXAMINE THE SITE AND THE COMPLETE SET OF PLANS AND SPECIFICATIONS COVERING THE ENTIRE PROJECT. THEY SHALL BECOME FULLY CONVERSANT WITH THE TYPE OF GENERAL CONSTRUCTION AS WELL AS ALL PERTINENT FACTS AFFECTING THE COST OF CARRYING OUT THE WORK THEY WILL CONTRACT TO PERFORM.

B. THIS CONTRACTOR SHALL COOPERATE TO THE FULLEST WITH ALL OTHER TRADES. HE SHALL PLAN HIS WORK IN SUCH A WAY, AND FURNISH ALL NECESSARY EQUIPMENT AND INFORMATION TO THE OTHER TRADES SO AS NOT TO DELAY ANY OTHER TRADE OR HINDER THE PROGRESS OF THE WORK.

1.08 SUBMITTALS

A. SUBMIT MANUFACTURERS TECHNICAL PRODUCT DATA LITERATURE FOR ALL MATERIALS SPECIFIED HEREIN. INDICATE AND HIGHLIGHT ON THE SUBMITTALS DETAILS OF ALL ITEMS TO INDICATE CORRECT INTERPRETATION OF THE CONTRACT DOCUMENTS. INCLUDE SUBMITTALS FOR THE FOLLOWING:

- 1. LIGHTING FIXTURES
- 2. WIRING DEVICES
- 3. PANELBOARDS

1.09 CONFLICTIONS

A. ANY CONTRADICTIONS BETWEEN THE WRITTEN SPECIFICATIONS AND DRAWINGS SHALL BE CONSIDERED AMBIGUOUS, AND WILL BE THE RESPONSIBILITY OF THE BIDDER TO SECURE CLARIFICATION PRIOR TO BIDDING.

B. THE TERM "PROVIDE" USED IN THE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS INDICATES THAT THE CONTRACTOR SHALL FURNISH AND INSTALL.

C. ANY CONFLICTS AND DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH ANY WORK.

PART 2 - PRODUCTS

2.01 GENERAL

A. ALL MATERIAL, EQUIPMENT, AND INSTALLATIONS SHALL CONFORM TO THE REQUIREMENTS OF THE FOLLOWING CODES:

- 1. NATIONAL ELECTRICAL CODE (NFPA-70) - 2020
- 2. CODE FOR LIFE SAFETY CODE (NFPA-101)
- 3. UNDERWRITERS' LABORATORIES (UL)
- 4. FEDERAL SPECIFICATION (FED. SPEC.)
- 5. OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (OSHA)
- 6. STANDARD FOR THE INSTALLATION, MAINTENANCE AND USE OF LOCAL PROTECTIVE SIGNALING SYSTEMS (NFPA-12)

- 7. NATIONAL ELECTRICAL MANUFACTURERS ASSOC. (NEMA)
- 8. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- 9. FLORIDA BUILDING CODE - 2023 AS AMENDED
- 10. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)
- 11. CITY OF PINECREST BUILDING CODE (AMENDMENTS TO FLORIDA BUILDING CODE 2023)
- 12. INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA)

2.02 PANELBOARDS

A. INSTALL NEW SQUARE PANELBOARDS AS DETAILED ON THE DRAWINGS COMPLETE WITH REQUIRED CIRCUIT BREAKERS.

B. CIRCUIT BREAKERS SHALL BE QUICK MAKE, QUICK BREAK, THERMAL MAGNETIC, TRIP INDICATING, AIC RATING, AMPACITY, SIZE AND DETAILS OF PANELBOARDS AND BRANCH CIRCUIT CIRCUIT BREAKERS SHALL BE AS INDICATED ON THE DRAWING PANEL SCHEDULES.

C. ALL 120 VOLT SINGLE PHASE 15- AND 20-AMPERE BRANCH CIRCUITS SUPPLYING OUTLETS OR DEVICES INSTALLED IN DWELLING UNIT KITCHENS FAMILY ROOMS DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DEN, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, LAUNDRY AREAS OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY A LISTED COMBINATION-TYPE ARC-FAULT CIRCUIT INTERRUPTER, INSTALLED TO PROVIDE PROTECTION OF THE ENTIRE BRANCH CIRCUIT.

D. ALL PANELBOARDS SHALL BE PROVIDED WITH AN "UP-TO-DATE" TYPE WRITTEN DIRECTORY OF BRANCH CIRCUIT/FEEDER DESIGNATIONS.

2.03 LIGHTING FIXTURES AND LAMPS

A. THE CONTRACTOR SHALL PROVIDE ALL LIGHTING FIXTURES, AND LUMINAIRES IN CONFORMANCE WITH THE FIXTURE SCHEDULE ON THE DRAWINGS, UNLESS OTHERWISE NOTED.

2.04 WIRING DEVICES

A. FURNISH AND INSTALL QUALITY DEVICES BEARING UL LABEL FOR THE SERVICE AND ELECTRICAL RATING WHERE USED.

- 1. SWITCHES SHALL BE 20 AMPERE, 120 VOLT A.C. RATED
- 2. GFCI DEVICES SHALL BE 20 AMPERE DUPLEX W/0 GROUND PIN.
- 3. ALL 125 VOLT, 15 AND 20 AMPERE RECEPTACLES SHALL BE LISTED TAMPER RESISTANT RECEPTACLES.

2.05 RACEWAYS

A. ALL BRANCH CIRCUIT WIRING SHALL BE IN RIGID GALVANIZED CONDUIT WHERE EXPOSED TO DAMAGE AND PUBLIC; EMT OR NON-METALLIC SHEATHED CABLE (AKA ROMEX) WITHIN BUILDING INTERIOR (EXCEPT FOR UNITS WITHIN COMMERCIAL BUILDINGS), PROVIDED SAME IS FREE FROM EXPOSURE/DAMAGE, AND PVC UNDERGROUND.

2.06 OUTLET AND JUNCTION BOXES

A. OUTLET BOXES FOR CEILING FIXTURES SHALL BE 4" OCTAGONAL GALVANIZED STEEL BOXES NOT LESS THAN 1/2" DEEP PROVIDED WITH 3/8" GALVANIZED MALLEABLE IRON FIXTURE STUD.

B. CONCEALED OUTLET BOXES FOR WALL BRACKETS, SWITCHES, AND RECEPTACLES SHALL BE A 4" SQUARE GALVANIZED STEEL BOX WITH RAISED COVER OF SUFFICIENT DEPTH TO ACCOMMODATE WALL SURFACE MATERIAL.

C. EXPOSED OUTLET BOXES IN DRY LOCATIONS FOR SWITCHES AND RECEPTACLES SHALL BE A 4" CAST BOX WITH HEAVY DUTY COVER.

D. BOXES SHALL BE FORMED OF HOT DIPPED GALVANIZED SHEET STEEL WHERE INSTALLED FLUSH WHERE BOXES ARE INSTALLED EXPOSED THEY SHALL BE OF THE CAST TYPE.

2.07 WIRES AND CABLES

A. PROVIDE AND INSTALL ALL WIRING AND CABLE AS REQUIRED TO CONNECT ALL ELECTRICAL EQUIPMENT AND DEVICES INDICATED ON THE PLANS.

2.08 VOLTAGE DROP

- 1. CONDUCTORS FOR ALL FEEDERS SHALL BE INCREASED FROM SIZES INDICATED ON DRAWINGS TO PREVENT VOLTAGE DROP EXCEEDING 2%.
- 2. CONDUCTORS FOR ALL BRANCH CIRCUITS SHALL BE INCREASED FROM SIZES INDICATED ON DRAWINGS TO PREVENT VOLTAGE DROP EXCEEDING 3% FROM THE FURTHEST DEVICE.
- 3. DETERMINING CONDUCTOR SIZES SHALL BE BASED ON 80% OF THE BREAKER RATING.
- 4. FOR DETERMINATION OF WIRE SIZE FOR BID PURPOSES:
 - * INCREASE WIRE BY 1 WIRE SIZE FOR RUNS 60 FT. TO 100 FT.
 - * INCREASE WIRE BY 2 WIRE SIZES FOR RUNS 100 FT. TO 150 FT.
 - * INCREASE WIRE BY 3 WIRE SIZES FOR RUNS FROM 150 FT. TO 230 FT.

PART 3 - EXECUTION

3.01 WORKMANSHIP

A. ALL WORK SHALL BE INSTALLED IN A NEAT WORKMANLIKE MANNER BY COMPETENT MECHANICS THOROUGHLY SKILLED IN THEIR RESPECTIVE TRADES AND IN STRICT ACCORDANCE WITH CODE REQUIREMENTS AND THE RESPECTIVE MANUFACTURERS INSTRUCTIONS.

3.02 TEMPORARY LIGHT AND POWER

A. FURNISH AND INSTALL TEMPORARY LIGHT & POWER AS MAY BE REQUIRED BY ALL TRADES.

3.03 SUPPORTS

A. PROVIDE ALL MATERIALS AND LABOR REQUIRED TO ADEQUATELY SUPPORT, BRACE AND STRENGTHEN EQUIPMENT AND MATERIALS FURNISHED AS PART OF THIS WORK.

B. ALL RACEWAYS, BOXES, ETC., SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE, INDEPENDENT OF DUCT, PIPING OR OTHER WORK.

C. ALL CONDUITS SHALL BE SECURELY AND INDEPENDENTLY SUPPORTED SO THAT NO STRAIN WILL BE TRANSMITTED TO OUTLET BOX AND PULL BOX SUPPORTS, ETC.

3.04 BRANCH CIRCUITS

A. PROVIDE ALL CONDUITS, OUTLETS, BOXES, WIRES, SWITCHES, RECEPTACLES, ETC., FOR A COMPLETE ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS.

B. CONTRACTOR SHALL CAREFULLY CHECK THE MECHANICAL AND PLUMBING DRAWINGS AND SPECIFICATIONS TO ESTABLISH THE EXTENT OF POWER AND CONTROL WIRING TO BE PROVIDED. CONTROL WIRING SHALL BE THE RESPONSIBILITY OF OTHERS.

3.05 GROUNDING

A. THE ELECTRICAL SYSTEMS SHALL BE COMPLETELY AND EFFECTIVELY GROUNDED AS REQUIRED BY THE NATIONAL ELECTRICAL CODE. ALL GROUND SYSTEMS AND CONNECTIONS SHALL BE MECHANICALLY SECURE AND ELECTRICALLY CONTINUOUS.

3.06 LOCATION OF OUTLETS AND ELECTRICAL EQUIPMENT

A. THE PLANS SHOW CONDITIONS AS ACCURATELY AS POSSIBLE BUT DO NOT NECESSARILY SHOW ALL THE FITTINGS, ETC., NECESSARY TO SUIT BUILDING CONDITIONS. LOCATIONS OF OUTLETS, APPLIANCES, ETC., ARE APPROXIMATE AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER LOCATIONS IN ORDER TO MAKE THEM FIT WITH THE ARCHITECTURAL DETAILS AND ALSO INSTRUCTIONS FROM THE ARCHITECTS REPRESENTATIVE ON THE JOB SITE.

B. BEFORE INSTALLATION OF CONDUIT FOR SWITCHES, RECEPTACLES, CEILING LIGHTS OR MOTORS, THE OWNER, ARCHITECT, RESERVE THE RIGHT TO MOVE EACH OUTLET LOCATION TO BETTER ADAPT THEM FOR USAGE, PRIOR TO INSTALLATION, WITHIN A DISTANCE OF THREE FEET AS PRESENTLY INDICATED, AT NO ADDITIONAL COST TO THE OWNER.

C. UNLESS INDICATED OTHERWISE ON THE DRAWINGS, ALL DEVICES SHALL BE MOUNTED AT A HEIGHT TO CONFORM TO THE AMERICAN DISABILITY ACT.

D. THE CONTRACTOR SHALL CAREFULLY CHECK WITH OTHER CONTRACTORS TO COORDINATE THE LOCATION OF ELECTRICAL EQUIPMENT WITH WORK OF OTHER TRADES.

E. VERIFY ALL DOOR SWINGS BEFORE ROUGHING IN FOR SWITCHES.

F. ALL ELECTRICAL INSTALLATIONS IN AREA OF NEW CONSTRUCTION MUST BE FLUSH MOUNTED. WITH THE EXCEPTION OF SURFACE MOUNTED LIGHTING FIXTURES, ELECTRICAL EQUIPMENT IS NOT TO BE SURFACE MOUNTED WITHOUT THE APPROVAL OF THE ENGINEER OR ARCHITECT.

G. THE CONTRACTOR SHALL CONFIRM WITH THE UTILITY COMPANY AND ALL REQUIREMENTS SUCH AS: METERING EQUIPMENT REQUIREMENTS AND METERING EQUIPMENT LOCATIONS TRANSFORMER SIZE AND LOCATION OR SERVICE POINT, CONDUIT ENTRY AND LUG SIZE RESTRICTIONS.

3.07 CLEANING AND REMOVAL OF RUBBISH

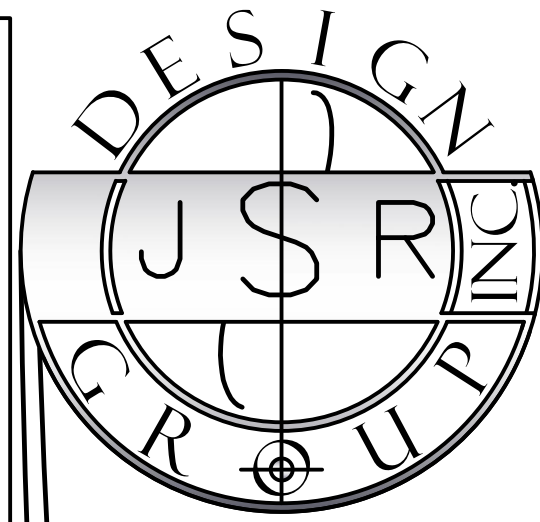
A. CONTRACTOR SHALL AT ALL TIMES KEEP THE PREMISES FREE OF ALL WASTE, SURPLUS MATERIALS, RUBBISH OR DEBRIS WHICH IS CAUSED BY HIS EMPLOYEES OR RESULTING FROM HIS WORK.

B. AFTER ALL EQUIPMENT AND DEVICES HAVE BEEN INSTALLED, REMOVE ALL LABELS, STICKERS, STAINS, TEMPORARY COVERS, ETC. IDENTIFICATION PLATES ON ALL EQUIPMENT.

3.08 SUBMITTALS

B. WITHIN 30 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION SHALL BE PROVIDED TO THE BUILDING OWNER, INCLUDING:

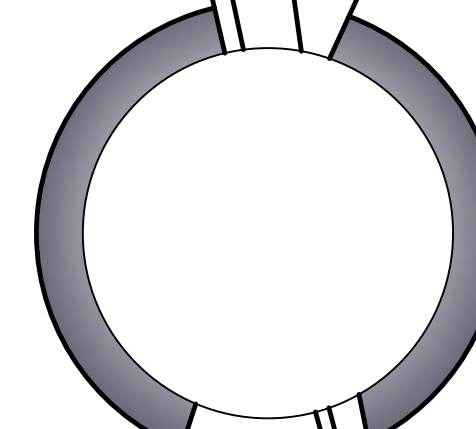
- 1. A SINGLE LINE DIAGRAM OF THE BUILDING ELECTRICAL DISTRIBUTION SYSTEM AND
- 2. FLOOR PLANS INDICATING LOCATION AND AREA SERVED FOR ALL DISTRIBUTION.
- C. OPERATING AND MAINTENANCE MANUALS SHALL BE PROVIDED TO THE BUILDING OWNER. THE MANUALS SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING:
 - 1. SUBMITTAL DATA STATING EQUIPMENT RATINGS AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE.
 - 2. OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. REQUIRED ROUTING MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED.
 - 3. NAMES AND ADDRESSES OF ATLEAST ONE QUALIFIED SERVICE AGENCY.



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8100 SW 120TH STREET
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E-0

ELECTRICAL SPECIFICATIONS, N.T.S.

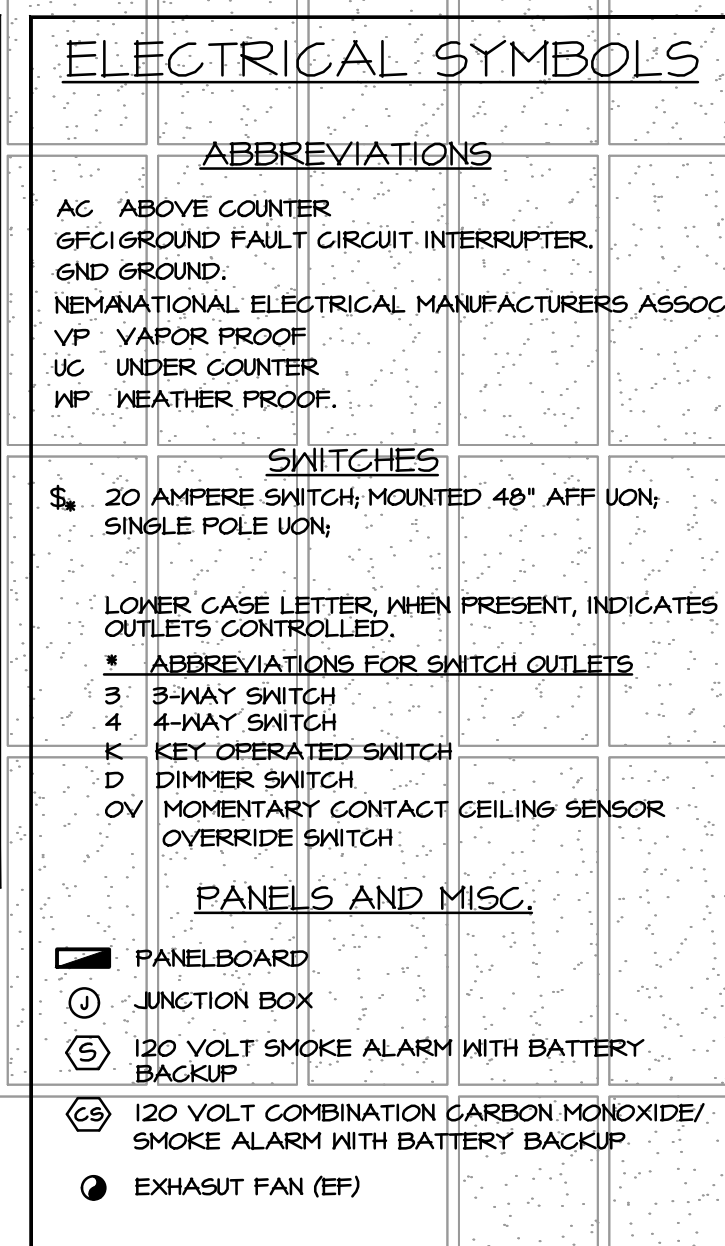
ELECTRICAL SHEET INDEX	
SHEET NO.	SHEET DESCRIPTION
E-0	ELECTRICAL SPECIFICATIONS & SHEET INDEX
E-1	ELECTRICAL LIGHTING PLAN
E-2	ELECTRICAL POWER PLAN
E-3	PANEL SCHEDULES, CALCULATIONS AND RISER DIAGRAM

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LIGHTING FIXTURE SCHEDULE							
SYMBOL	TYPE	DESCRIPTION	INPUT WATTS	MANUFACTURER/ MODEL #	LAMP		REMARKS
					QTY	TYPE	
	A	LED RECESSED DOWNLIGHT	10W MAX	SELECTED BY OWNER PROVIDED AND INSTALLED BY CONTRACTOR	-	LED	(A1)
	B	LED RECESSED DOWNLIGHT, OUTDOOR	10W MAX	SELECTED BY OWNER PROVIDED AND INSTALLED BY CONTRACTOR	-	LED	(A2) (A1)
	C	RECESSED, LED DOWNLIGHT VAPOR PROOF	10W MAX	SELECTED BY OWNER PROVIDED AND INSTALLED BY CONTRACTOR	-	LED	(A1)
	D	JUNCTION BOX FOR FAN/ PENDANT LIGHT/CEILING LIGHT	10W MAX	SELECTED BY OWNER PROVIDED AND INSTALLED BY CONTRACTOR	-	LED	(A1)
	F	LED STRIP/ROPE LIGHTING	10W MAX	SELECTED BY OWNER PROVIDED AND INSTALLED BY CONTRACTOR	-	LED	(A1)
	G	JUNCTION BOX FOR DECORATIVE MALL PACK	25W MAX	SELECTED BY OWNER PROVIDED AND INSTALLED BY CONTRACTOR	-	LED	(A1)
NOTES:							
(A1)	VERIFY LIGHT FIXTURE FINISH AND CEILING TYPE WITH ARCHITECT.			(A2)	ALL EXTERIOR FIXTURES SHALL BE U.L. LISTED FOR WET LOCATION.		

ELECTRICAL SYMBOLS

ABBREVIATIONS

AC ABOVE COUNTER
GFCI GROUND FAULT CIRCUIT INTERRUPTER.
END ENDPOINT.
NEMA NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
VP VAPOR PROOF
UC UNDER COUNTER
WP WEATHER PROOF.

SWITCHES

\$ 20 AMPERE SWITCH; MOUNTED 48" AFF UON;
SINGLE POLE UON;

LOWER CASE LETTER WHEN PRESENT, INDICATES OUTLETS CONTROLLED.

- * ABBREVIATIONS FOR SWITCH OUTLETS
- 3 3-WAY SWITCH
- 4 4-WAY SWITCH
- K KEY OPERATED SWITCH
- D DIMMER SWITCH
- O/V MOMENTARY CONTACT CEILING SENSOR OVERRIDE SWITCH

PANELS AND MISCELLANEOUS

 PANELBOARD

(J) JUNCTION BOX

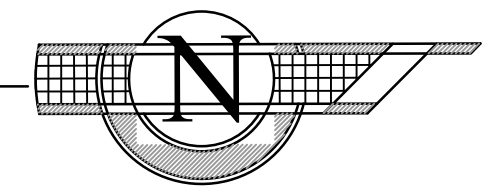
(S) 120 VOLT SMOKE ALARM WITH BATTERY BACKUP

(CS) 120 VOLT COMBINATION CARBON MONOXIDE/SMOKE ALARM WITH BATTERY BACKUP

(F) EXHAUST FAN (EF)

LIGHTING PLAN

3/16" SCALE.



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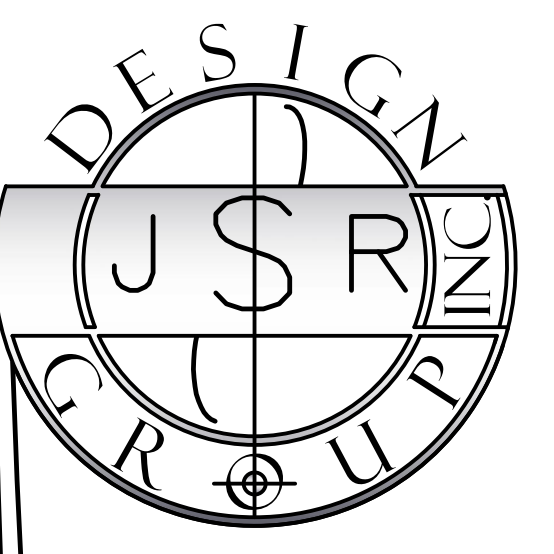
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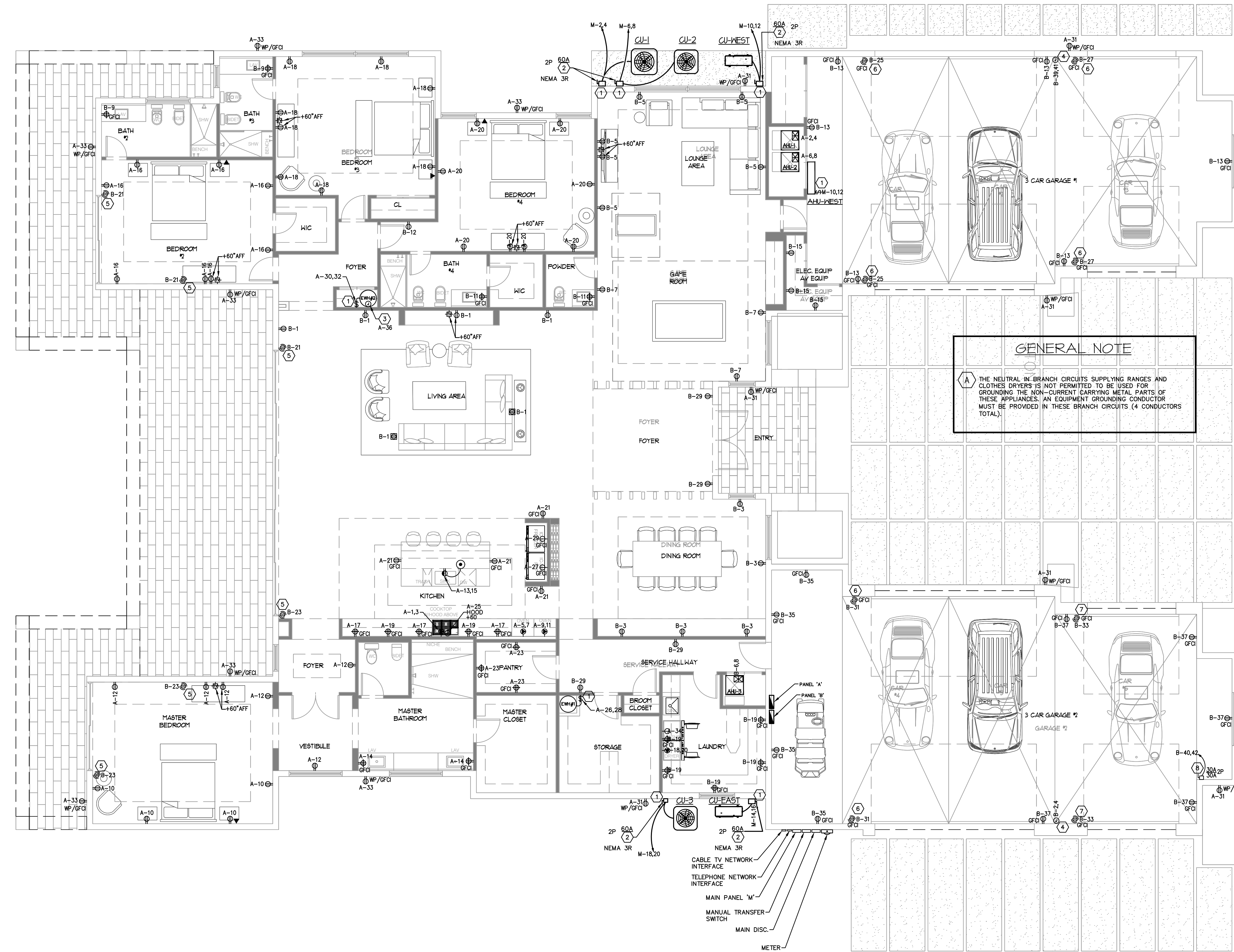
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E-1



ELECTRICAL SYMBOLS

ABBREVIATIONS	
AC	ABOVE COUNTER
AFF	ABOVE FINISHED FLOOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
EX	EXISTING TO REMAIN
RE	RELOCATED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
T/S	ASTRONOMIC TIME SWITCH
VP	VAPOR PROOF
UON	UNLESS OTHERWISE NOTED
WP	WEATHER PROOF
PB	PUSH BUTTON

PANELS AND MISC.

	PANELBOARD
	TRANSFORMER
	JUNCTION BOX
	FUSED SAFETY (DISCONNECT) SWITCH. A=FRAME SIZE, B=FUSE SIZE, C=#OF POLES.
	CABLE TV OUTLET - WALL - MOUNTED 18" AFF UON. PROVIDE OUTLET BOX IN WALL WITH 3/4" CONDUIT TO 6" ABOVE CEILING WITH PULL WIRE. WIRING BY OTHERS.
	TELEPHONE OUTLET - WALL - MOUNTED 18" AFF UON. PROVIDE 444 OUTLET BOX IN WALL WITH 5/8" CONDUIT TO 6" ABOVE CEILING WITH PULL WIRE. WIRING BY OTHERS.
	FACTORY MOUNTED DISCONNECT/STARTER (SEE MECHANICAL SCHEDULE)

RECEPTACLES

	GROUNDING DUPLEX RECEPTACLE (NEMA 5-20R); MOUNTED 18" AFF UON; NUMBER INDICATES CIRCUIT.
	SPECIAL PURPOSE RECEPTACLE; COORDINATE EXACT NEMA TYPE WITH EQUIPMENT SUPPLIER; MOUNTED 18" AFF UON.
	GROUNDING DUPLEX RECEPTACLE (NEMA 5-20R); MOUNTED 42" ABOVE FINISHED FLOOR.
	SPLIT WIRED GROUNDING DUPLEX RECEPTACLE (NEMA 5-20R); MOUNTED 18" AFF UON.
	GROUNDING SINGLE RECEPTACLE (NEMA 5-20); MOUNTED 18" AFF UON.
	GROUNDING DUPLEX RECEPTACLE (NEMA 5-20R); RECESSED, FLOOR MOUNTED W/COVER PLATE & CARPET FLANGE; NUMBER INDICATES CIRCUIT.
	GROUNDING DUPLEX RECEPTACLE (NEMA 5-20R); CEILING MOUNTED; NUMBER INDICATES CIRCUIT.
	PUSH BUTTON
	DISPOSAL PUSH BUTTON (AIR) SWITCH INSTALLED FLUSH WITH COUNTER TOP.

SHEET NOTES

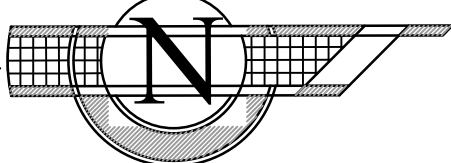
1. MOUNT DISCONNECT ON/ADJACENT TO EQUIPMENT SERVED. LOCATE DISCONNECT TO PROVIDE CLEARANCE AND ACCESS AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.
2. PROVIDE FUSES AS RECOMMENDED BY EQUIPMENT MANUFACTURER.
3. PROVIDE JUNCTION BOX FOR ELECTRICAL CONNECTION TO RECIRCULATION PUMP. COORDINATE EXACT LOCATION AND ALL REQUIREMENTS WITH EQUIPMENT SUPPLIER.
4. PROVIDE JUNCTION BOX FOR ELECTRICAL CONNECTION TO ELECTRIC VEHICLE CHARGER. COORDINATE EXACT LOCATION AND ALL REQUIREMENTS WITH EQUIPMENT SUPPLIER.
5. PROVIDE CEILING MOUNTED RECEPTACLE FOR MOTORIZED SHADES.
6. PROVIDE CEILING MOUNTED RECEPTACLE FOR SIDE MOUNTED GARAGE OPENER.
7. PROVIDE CEILING MOUNTED RECEPTACLE FOR HIGH LIFT GARAGE OPENER.
8. PROVIDE DISCONNECT FOR CAR LIFT AS INDICATED. LIFT TO BE SELECTED BY OWNER. INSTALL PER MANUFACTURER'S SPECIFICATIONS.

GENERAL NOTE

THE NEUTRAL IN BRANCH CIRCUITS SUPPLYING RANGES AND CLOTHES DRYERS IS NOT PERMITTED TO BE USED FOR GROUNDING THE NON-CURRENT CARRYING METAL PARTS OF THESE APPLIANCES. AN EQUIPMENT GROUNDING CONDUCTOR MUST BE PROVIDED IN THESE BRANCH CIRCUITS (4 CONDUCTORS TOTAL).

POWER PLAN

3/16" SCALE.

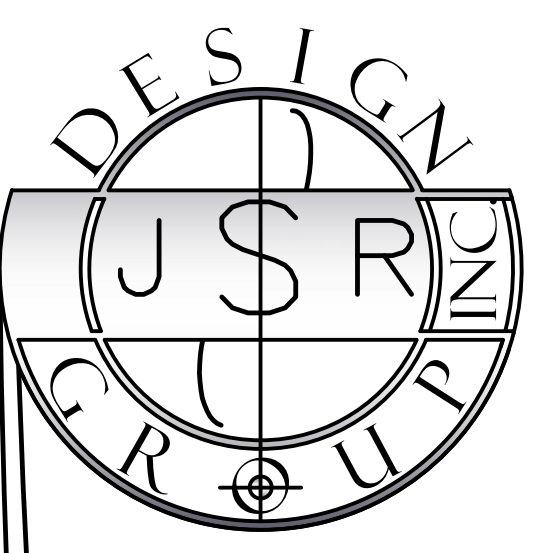


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2. Contractor to verify all written dimensions (Not scaled) & notify architect of any discrepancies or omissions. Construction shall not proceed until said discrepancies or omissions have been resolved by architect.
3. Contractor to verify and approve all shop drawings and dimensions before having drawings reviewed and accepted by the architect prior to construction.

27423

E-2

MIPS SHORT CIRCUIT FROM ELECTRICAL UTILITIES = 42,412 A RMS

WIRE IS: 600 KCMIL

NUMBER OF CONDUCTORS PER PHASE: 1

CONDUCTOR LENGTH L': 100'

CONDUCTOR G VALUE: 29,293

$$F = \frac{2.0 \times L \times L}{G \times E} = \frac{2.0 \times 100 \times 42,412}{29,293 \times 240} = \frac{8,994,400}{6,171,920} = 1.26$$
$$M = \frac{1}{1 + F} = \frac{1}{1 + 1.26} = 0.44$$

I_{SCA} = AVAILABLE FROM UTILITY $\times M$ = 42,412 $\times$ 0.44 = 18,661 A RMS

I_{SCA} MOTOR CONTRIBUTION = NEGLECTABLE

$$I_{SCA \text{ TOTAL}} = I_{SCA} \text{ AVAILABLE FROM UTILITY} + I_{SCA} \text{ MOTOR CONTRIBUTION} = 18,661 \text{ A RMS}$$

AT 400A
MAIN CIRCUIT
BREAKER

MINIMUM BREAKER A.I.C. RATING = 22,000 A.I.C.

L = LENGTH (feet) OF CIRCUIT TO FAULT

G = CONSTANT VALUE FOR CONDUCTORS - FOR PARALLEL RUNS MULTIPLY
"G" VALUE BY NUMBER OF CONDUCTORS PER PHASE

I = AVAILABLE SHORT CURRENT IN AMPERES AT BEGINNING OF CIRCUIT

AMPS SHORT CIRCUIT FROM "MAIN CIRCUIT BREAKER" = 10,601 A RMS

WIRE IS: 600 KCMIL

NUMBER OF CONDUCTORS PER PHASE: 1

CONDUCTOR LENGTH L': 5'

CONDUCTOR C VALUE: 28,028

$$I = \frac{20 \times L \times L}{C \times E} = \frac{20 \times 5 \times 10,601}{28,028 \times 240} = \frac{10,6010}{6,172,320} = 0.028$$

$$M = \frac{1}{1+I} = \frac{1}{1+0.028} = 0.97$$

I_{SCA} = AVAILABLE FROM UTILITY $\times M$ = 10,601 $\times$ 0.97 = 10,266 A RMS

I_{SCA} MOTOR CONTRIBUTION = NEGIGIBLE

$I_{SCA} \text{ TOTAL} = I_{SCA} \text{ AVAILABLE FROM UTILITY} + I_{SCA} \text{ MOTOR CONTRIBUTION} = 10,266 \text{ A RMS AT PANEL "M"}$

MINIMUM BREAKER A.I.C. RATING = 22,000 A.I.C.

L = LENGTH (feet) OF CIRCUIT TO FAULT

C = CONSTANT VALUE FOR CONDUCTORS - FOR PARALLEL RUNS MULTIPLY "C" VALUE BY NUMBER OF CONDUCTORS PER PHASE

I = AVAILABLE SHORT CIRCUIT IN AMPERES AT BEGINNING OF CIRCUIT

MPS SHORT CIRCUIT FROM "PANEL M" = 18126 A RMS

WIRE SIZE = 310

NUMBER OF CONDUCTORS PER PHASE = 30

CONDUCTOR LENGTH L' = 30'

CONDUCTOR G VALUE = 18123

$$f = \frac{20 \times L \times L'}{G \times E} = \frac{20 \times 30 \times 18126}{18123 \times 240} = \frac{1087360}{3341520} = 0.32$$

$$M = \frac{1}{1 + f} = \frac{1}{1 + 0.32} = 0.76$$

I_{SCA} = AVAILABLE FROM UTILITY $\times M = 18126 \times 0.76 = 13751$ A RMS

I_{SCA} MOTOR CONTRIBUTION = NEGLECTABLE

$$I_{SCA \text{ TOTAL}} = I_{SCA} \text{ AVAILABLE FROM UTILITY} + I_{SCA} \text{ MOTOR CONTRIBUTION} = 13751 \text{ A RMS AT PANEL "M"}$$

MINIMUM BREAKER A.I.C. RATING = 18000 A.I.C.

L = LENGTH (feet) OF CABLE TO FAULT

G = CONSTANT VALUE FOR CONDUCTORS - FOR PARALLEL RUNS MULTIPLY "L" VALUE BY NUMBER OF CONDUCTORS PER PHASE

I = AVAILABLE SHORT CIRCUIT IN AMPERES AT BEGINNING OF CIRCUIT

APPS SHORT CIRCUIT FROM "PANEL M" = 10,126 A RMS

WIRE IS:
 NUMBER OF CONDUCTORS PER PHASE: 1
 CONDUCTOR LENGTH L₁: 35'
 CONDUCTOR C VALUE: 19423

$$I = \frac{20 \times L \times L}{C \times E} = \frac{20 \times 35 \times 19423}{19423 \times 240} = \frac{1268820}{3546520} = 0.36$$

$$M = \frac{1}{1 + I} = \frac{1}{1 + 0.36} = 0.72$$

I_{SCA} = AVAILABLE FROM UTILITY X M = 10,126 A RMS / 10,050 A RMS

I_{SCA} MOTOR CONTRIBUTION = NEGLECTABLE

I_{SCA}TOTAL = I_{SCA} = AVAILABLE FROM UTILITY + I_{SCA} MOTOR CONTRIBUTION = 10,050 A RMS AT PANEL "B"

MINIMUM BREAKER A.I.C. RATING = 10,000 A.I.C.

L = LENGTH (feet) OF CIRCUIT TO FAULT

C = CONSTANT VALUE FOR CONDUCTORS - FOR PARALLEL RUNS MULTIPLY "C" VALUE BY NUMBER OF PARALLEL RUNS PER PHASE

= AVAILABLE SHORT CURRENT IN AMPERES AT BEGINNING OF CIRCUIT

TOTAL CURRENT:	364 AMPS
1-WAY LENGTH OF CIRCUIT:	100 FEET
CONDUCTOR TYPE:	COPPER
OF CONDUCTORS PER PHASE:	
CONDUCTOR TEMPERATURE RATING:	75°C
VOLTAGE:	240V, 1Ø
CONDUCTOR SIZE:	600 KCMIL
VOLTAGE DROP = 2.91 VOLTS	
% VOLTAGE DROP = 1.21 %	
VOLTAGE AT LOAD = 237.09 VOLTS	

SOURCE: VOLTAGE DROP CALCULATOR (CALCULATOR.NET)

TOTAL CURRENT: 364 AMPS
 1-WAY LENGTH OF CIRCUIT: 5 FEET
 CONDUCTOR TYPE: COPPER
 NO. OF CONDUCTORS PER PHASE: 1
 CONDUCTOR TEMPERATURE RATING: 75°C
 VOLTAGE: 240V, 1Ø
 CONDUCTOR SIZE: 600 KCMIL
 VOLTAGE DROP = 0.15 VOLTS
 % VOLTAGE DROP = 0.064 %
 VOLTAGE AT LOAD = 239.85 VOLTS

SOURCE: VOLTAGE DROP CALCULATOR (CALCULATOR.NET)

TOTAL CURRENT:	170 AMPS
HWAY LENGTH OF CIRCUIT:	30 FEET
CONDUCTOR TYPE:	COOPER
NO. OF CONDUCTORS PER PHASE:	1
CONDUCTOR TEMPERATURE RATING:	75°C
VOLTAGE:	240V, 1Ø
CONDUCTOR SIZE:	3/0 KCMIL
VOLTAGE DROP = 0.94 VOLTS	
% VOLTAGE DROP = 0.38 %	
VOLTAGE AT LOAD = 239.06 VOLTS	

SOURCE: VOLTAGE DROP CALCULATOR (CALCULATOR.NET)

TOTAL CURRENT:	101 AMPS
HWY LENGTH OF CIRCUIT:	35 FEET
CONDUCTOR TYPE:	COPPER
NO. OF CONDUCTORS PER PHASE:	1
CONDUCTOR TEMPERATURE RATING:	75°C
VOLTAGE:	240V, 1Ø
CONDUCTOR SIZE:	3/0 KCMIL
VOLTAGE DROP = I*RI VOLTS	
VOLTAGE DROP = 0.46 %	
VOLTAGE AT LOAD = 239.54 VOLTS	

SOURCE: VOLTAGE DROP CALCULATOR (CALCULATOR.NET)

- 1 MUO GROUNDING ELECTRODE CONDUCTOR IN 3/4" SCHEDULE 40 PVC CONDUIT.
- 2 10 FT. LONG x 3/4" DIAMETER COPPER DRIVEN GROUND ELECTRODE.
- 3 MAKE CONNECTION TO METALLIC COLD WATER ENTRANCE PIPE BEFORE FIRST VALVE WITH HEAVY DUTY BRONZE GROUND CLAMP (TYPICAL).
- 4 PROVIDE (1) 1/0 BONDING JUMPER AROUND FIRST VALVE.
- 5 NEUTRAL BAR
- 6 GROUND BAR.
- 7 PROVIDE (1) 1/0 BONDING JUMPER.
- 8 PROVIDE (1) #6 BONDING JUMPER.

[illegible][illegible]

VOLTAGE: 240/120V PHASE: 1	WIRE: 3 AMP: 20	A/C: 18,000 TYPE: MLO	NEMA TYPE: 1 MOUNTING: RECESSED	MANUFACTURER: SQUARE D MODEL: QO LOAD CENTER							
LOAD DESCRIPTION		BRANCH CIRCUIT		PANEL A		PANEL B		BRANCH CIRCUIT		LOAD DESCRIPTION	
	WIRE	GND	COND	THP	CKT	A	KVA	CKT	THP	COND	WIRE
LIVING ROOM RECP (A)	2	1#12	1#12	12	3	*	5.8	*			
DINING ROOM(A)	2	1#12	1#12	12	3	*	5.8	4	502	1"	2#10
KITCHEN (A)	2	1#12	1#12	20	6	*	5.8	6	502	1"	2#10
BATH ROOM (A)	2	1#12	1#12	20	9	*	5.8	10	502	1"	2#10
BATH RECEPT (B)	2	1#12	1#12	20	9	*	5.8	10	502	1"	2#10
HALLWAY (B)	2	1#12	1#12	20	10	0.8	5.8	10	502	1"	2#10
GARAGE I RECEPT (B)	2	1#12	1#12	20	13	1.0	*	14	20	12"	2#12
AV- BOPD CLOSET (A)	2	1#12	1#12	20	19	*		18	20	12"	2#12
SHED (A)	2	1#12	1#12	20	17	1.0	1.0	18	20	12"	2#12
LAUNDRY RECEPT (A)	2	1#12	1#12	20	21	1.0	*	20	20	12"	2#12
MOTORIZED SHED (A)	2	1#12	1#12	20	21	1.0	*	20	20	12"	2#12
MOTORIZED SHED (A)	2	1#12	1#12	20	23	2.0	*	24	20	12"	2#12
GARAGE I DOOR OPENERS	2	1#12	1#12	20	29	1.0	*	28	20	12"	2#12
GARAGE I DOOR OPENERS	2	1#12	1#12	20	30	1.0	*	28	20	12"	2#12
FOYER HALLWAY (A)	2	1#12	1#12	20	29	*	*	20	20	12"	2#12
GARAGE I DOOR OPENERS	2	1#12	1#12	20	31	1.0	*	18	20	12"	2#12
GARAGE I DOOR OPENERS	2	1#12	1#12	20	33	1.0	*	34			
GARAGE I RECEPT (B)	2	1#12	1#12	20	33	1.0	*	34			
GARAGE I RECEPT (B)	2	1#12	1#12	20	37	1.0	1.0	38			
EV CHARGER (B)	2	4#4	1#10	1"	602	29		402	302	12"	2#10
					41	7.7	1.3				
						33.4	3.1				
						37	3.7				
						50	5.0				
						5.4	5.4				
						11.3	11.3				
						21.7	21.7				
						43.4	43.4				
						181	181				
Lighting & Receptacles @ 3VA / SQFT Bedroom Area - 2515 SQFT X 3 VA = 7.5 KVA Heating @ 65% (04 KVA) = 22.6 KVA Cooling @ 100% = 11.8 KVA NOTES: (A) Provide Combination Type Arc Fault Circuit Breaker (B) Provide Combination Type Arc/Ground Fault Circuit Breaker * Denotes Lighting & Receptacles at 3VA / SQFT (C) Denotes Non-Neutral Load Denotes Load Shown is Manufacturer's Min. Circuit Ampacity											
				CONNECTED KVA PER PHASE				GENERAL LIGHTING & RECEPTABLES AT 3VA/SQFT			
				TOTAL CONNECTED LOAD				TOTAL CONNECTED LOAD			
				EST TO LOAD AT 100%				REMAINDER LESS HEATING AT 40%			
				HEATING AT 65%				DEMAND KVA PER PHASE			
				DEMAND AMPS PER PHASE				TOTAL DEMAND KVA			
				TOTAL DEMAND AMPS				TOTAL DEMAND AMPS			

VOLTAGE: 240/120V PHASE: 1		WIRE: 3 AMP: 400 (100% RATED)		A.I.C. 22,000 TYPE: MCB		NEMA TYPE: 3R MOUNTING: SURFACE		MANUFACTURER: SQUARE D MODEL: QO LOAD CENTER				
LOAD DESCRIPTION	BRANCH CIRCUIT				PHASE A KVA	PHASE X KVA	BRANCH CIRCUIT			LOAD DESCRIPTION		
	WIRE	GRND	COND	TRIP	OKT	1	KVA	OKT	TRIP		COND	GRND
PANEL A	3	830	1 #6	2"	2002	3	21.4 (4.0)	2	602	1"	1 #10	2 #6
PANEL B	3	830	1 #6	2"	2002	3	21.4 (4.0)	4	502	1"	1 #10	2 #6
SPD					302	6	17.3 (3.5)	8	502	1"	1 #10	2 #6
					302	9	0.9 (3.0)	10				
					11		0.6 (3.0)	12	352	1"	1 #10	2 #6
SPACE					13	15	3.0	14	352	1"	1 #10	2 #6
SPACE					15			16	30	16		
SPACE					17		(2.3)	18	402	1"	1 #10	2 #6
SPACE					19		(2.3)	20				
SPACE					21			22				
SPACE					23			24				
						45.3	45.3					
						377.5	377.5					
						90.6						
						378						

NOTES:
 (A) Provide Combination Type ARC Fault Circuit Breaker
 (B) Provide Combination Type ARC/Ground Fault Circuit Breaker
 * Denotes Lighting and Receptacles at 3VA / SOFT
 (i) Denotes Non-Neutral Load
 ** Denotes Load Shown is Manufacturer's Min. Circuit Ampacity.
 SPD - Surge Protection Device

ELECTRICAL RISER DIAGRAM, N.T.S.

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ENGINEER OF RECORD

MARTIN WHITELOCKE
FLORIDA LICENSE NO. 53899

3/4/2025
DATE



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&
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E-3