White Paper

Cost Analysis Study for Operating Rooms Grounded Power vs. Isolated Power

Abstract - Healthcare facility governing bodies are often faced with making decisions regarding which type of power system they should build into their operating rooms. This study was conducted to explore the cost difference between isolated power and grounded power for operating rooms and to address the question, "Is it worth it?" The conclusion of this study makes a strong argument that the potential cost savings do not justify the added risks associated with grounded power. The final recommendation resulting from this study supports the preferred standard of choosing isolated power for operating rooms.

Why is this study important and how was the study conducted?

Historically, power distribution in operating rooms (ORs) has created confusion in the marketplace given the various techniques, codes (and changes to codes), and perceptions about the efficacy and cost of the various options. This study was completed by a tenured engineer specializing in hospital electrical design to better understand the true cost differences between three different types of electrical installations for ORs. The first type of system studied was an isolated power system (IPS), installed to meet modern code requirements, (see System Explanations below) and to promote patient and staff safety. The second system evaluated was a grounded power system, with GFCI devices installed in lieu of IPS. The third system considered was a grounded power system, installed without special shock protection because a completed risk assessment determined that the associated ORs were not wet procedure locations and therefore no special shock protection was required by code.

This study presents the cost differences as calculated by an electrical contractor and reviewed by an engineer. This was achieved by the engineer creating drawings and descriptions as if the study project were an actual facility to be built. This information was sent to an electrical contractor who obtained bids through the distribution +channel for the various system options described above. The electrical contractor applied standard margins to the equipment and material and then determined their labor costs for the various options. This information was then submitted back to the engineer for review. Please note that no general contractor was used in this study. General contractors would add cost to the owner of the project however, their cost as a percentage basis would be the same to each type of system under study. Therefore, no general contractor margins were considered relevant to this study of OR power system cost differential.

System Descriptions

Isolated Power System (IPS)

Per NFPA 99 (Health Care Facilities Code) (2012-present), all ORs are, by default, considered wet procedure locations unless a risk assessment has been completed by the healthcare facility governing bodies. The National Electric Code and NFPA 99 require that all wet procedure locations shall be provided with "special protection against electric shock". A wet procedure location therefore requires an IPS or other means of protecting the patient and staff in the space. For good reasons, isolated power systems are the preferred way to accommodate power distribution within operating rooms.

An IPS includes an electronic device called a line isolation monitor (LIM) which monitors the electrical impedance integrity of the distribution system and connected medical devices. The LIM will alarm when the "Total Hazard Current" of the system presents a potential danger to patient and staff. Since neither of the current carrying conductors of an IPS are referenced to ground, this type of system inherently limits the magnitude of available ground fault current; thus, allowing either conductor to connect directly to ground (first fault) so that in most situations, no patient or staff shock hazard exists and very importantly, power is maintained to the medical equipment during a single ground fault.

NFPA 99 requires at least 36 receptacles per OR. At least 12 of those receptacles must be connected to the normal branch or critical branch supplied by a different transfer switch other than the other receptacles in that OR. This requires at least two IPS panels per room. Another code requirement is that branch circuits from isolated power panels (IPP) must be dedicated to a single room. However, there is an exception for most laser control panels. Code allows for IPPs with branch circuit voltages above 150V to feed receptacles in multiple rooms. Most laser IPPs are 208V or 240V and often power laser receptacles in multiple rooms. Laser IPPs control/limit the number of simultaneously energized circuits to mitigate IPP overload conditions.

Grounded Power System, with GFCI devices

This type of system is code compliant for wet procedure locations but requires a risk assessment to determine if a power loss is tolerable. Instead of including GFCI breakers in the panels, GFCI receptacles were included in the bill of material for this type of system. NFPA 99 (6.3.2.3.9) states that "Each receptacle shall be an individual GFCI device." or "Each receptacle shall be protected by a single GFCI device." Both options have inherent problems when it comes to practical use. When a GFCI trips, it interrupts power to the associated circuit. In many cases, interrupting power during a medical procedure introduces undesired risks to the patient. Interrupting power is an unnecessary risk that most Health Care Facility's Governing Bodies find unacceptable. Code requires Health Care Facility's Governing Bodies to perform risk assessments to determine if a power loss in an operating room is tolerable. The GFCI devices chosen for this option must be capable of interrupting power to the associated circuit when ground fault current exceeds 5mA. This presents a safety concern in that current must flow for the GFCI device to operate and interrupt power. The path of ground fault current may be through a patient or clinician. Lastly, GFCI manufacturers always include disclaimers in their application and installation literature. The disclaimers clearly state that GFCI devices should not be used for life safety equipment in ICUs or ORs. Adhering to the GFCI manufacturers' recommendations makes the application of GFCI devices in an OR extremely limited and ill-advised.

Grounded Power System –no Special Shock Protection

This type of system is the most common electrical system utilized in commercial and residential structures. This type of system is only permitted in operating rooms if the healthcare facility's governing body has completed a formal risk assessment and determined that the ORs being served are not wet procedure locations and never will be. Risk assessments should be conducted with input from a multi-disciplinary team (including clinicians and facility personnel) that fully understands the potential risk in the operating rooms and how loss of power could affect patients. Risk assessments should be completed for each room/space and consider the types of procedures planned to occur in such rooms. A blanket risk assessment for an entire facility is not appropriate. While conducting risk assessments, it is prudent to consider future flexibility and unplanned overflow. For purposes of this study, distribution panels were dedicated to each OR. While it may be possible for a single GPS panel to distribute power to multiple rooms, there are many rationales not to do so. The first reason is due to the number of circuits per room. A second reason is because of the requirement that a panel providing power to multiple rooms must be centrally located but not located in exit passageways. Meeting these requirements can be nearly impossible in a practical sense.

Other Study Considerations

Code requires that all operating rooms be fed from multiple electrical sources. For the purposes of this study, all operating rooms were fed with two critical power circuits. The two panels that supplied each room were fed from different upstream transfer switches, so that all power to the ORs was backed up by the facility generator. There were three laser IPPs which each provided power to four rooms at 208V. Two of the three laser IPPs were powered from the first critical branch circuit. The third panel was fed from the second critical branch. Further explanation can be gleaned by study of the electrical system drawings provided below.

NFPA 99 mandates the "Health Care Facility's Governing Body" must complete any risk assessments. This is the persons who have the overall legal responsibility for the operation of the health care facility. This means that risk assessments should not be completed solely by facilities staff, clinical staff, or by design and construction staff. Each of these departments should provide input and information, and final acceptance of the assessment recommendations must be provided by the healthcare facility governing bodies .

Pricing derived for the study was based on twelve operating rooms for the associated electrical gear noted on the one-line diagram below. Increasing or decreasing the quantity of ORs could significantly influence the pricing because projects are typically priced as packages adding or removing rooms would require a different number of panels and the upstream gear feeding those panels would also be different depending on the number of rooms added or subtracted. Thus, the costs could be significantly different based on these factors.

Project Materials

Grounding & Bonding

A running green wire was provided with all feeder and branch circuits. Grounding of the IPP were to manufacturer recommendations.

Conductors

All feeders and branch conductors were copper. EMT conduit was used for all feeders and branch conductors. MC cable was not permitted. All conductors were a minimum of #10 AWG and rated for 600V. All IPS secondary branch circuits were wired with XHHW type insulation. Type THHN/THWN/THW or XHHW were available options to be used for the grounded power systems and all ground conductors. Conductors over #10 were stranded. All #10 conductors were solid building wire.

No wire pulling compound was allowed for the installation of branch circuit conductors for the IPPs.

Receptacle Outlets

Code requires all critical power receptacles to be distinguishable. Red power receptacles with red cover plates along with stainless steel device identification plates were required. Hospital grade, 20A receptacles were required for all 120V branch circuits. Devices with manufactured "quick" connections were not allowed. Devices with manufactured "quick" connections were not be allowed.

Summary of costs

Refer to following attached figures and illustrations:

Figure 1: Isolated Power System One-Line Diagram

Figure 2: Grounded Power System One-Line Diagram

Figure 3: Panel Schedules Rooms 1-4

Figure 4: Panel Schedules Rooms 5-8

Figure 5: Panel Schedules Rooms 9-12

Figure 6: Room Power Plans (1-4)

Figure 7: Room Power Plans (5-8)

Figure 8: Room Power Plans (9-12)

Figures 9-11: Supplier Estimate Report for Isolated Power System Equipment and Materials

Figures 12-14: Supplier Estimate Report for Grounded Power System Equipment and Materials (With GFCIs)

Figures 15-17: Supplier Estimate Report for Grounded Power System Equipment and Materials (Without GFCIs)

Contractor pricing

The estimate reports were provided by an electrical contractor. Costs were provided using standard markups and labor rates in effect at the time of this study.

The table below provides a cost comparison between the three systems under study. This table was derived from the information contained within the contractor provided estimate reports.

Grounded Power System with GFCI vs Grounded Power System – no special shock protection

The cost difference between these two systems, based upon the drawings was $11,644 ($239,244-$227,600). This represented an added cost per OR of $970 for a grounded power system with GFCI receptacles. The added cost was split almost evenly between additional equipment and labor.

	Equipment Cost (Transformers, Breakers, Panels etc)	Material Cost (Wire, Conduit etc)	Install Labour Upstream of OR Panels	Materials Branch Circuits in ORs (Receptacles, Conduit, etc)	Labor - Branch Circuit in ORs	Miscellaneous Job Expenses & Consumables	Taxes for Contractor Provided Material	Overhead & Profit (Electrical Contractor)	Total Subcontract Price
Isolated Power System	$194.934	$4,847	$24,598	$25,112	$68,850	$4,972	$2,472	$20,282	$346,065
Grounded Power System with GFCI	$56,474	$13,756	$31,815	$30,315	$73,037	$5,683	$3,636	$24,528	$239,244
Grounded Power System without GFCI	$56,474	$13,756	$31,815	$25,112	$68,850	$5,422	$3,207	$22,965	$227,600

Isolated Power System vs. Grounded Power System – no special shock protection

These two systems had a price difference of $118,465 ($346,065-$227,600). This represented an added cost per OR of $9,872 for the isolated power system. The cost difference associated with the equipment and materials was $129,551 ($224,893-$95,342). Labor costs were more for the grounded power system scenario. The GPS panels required a wye three phase 208V/120V supply. The IPPs included integral step-down isolation transformers with 480V primaries. Therefore, the feeders for the GPS panels required an additional phase conductor and larger conductors resulting in higher wiring costs as compared to the IPPs. The GPS scenario also required more labor to wire and terminate the four large breakers (2x 350A, 2x 700A) due to the upstream, step-down transformer. The IPS scenario did not require an upstream, step-down transformer, so only wiring two large breakers (2x 600A) were needed.

Isolated Power vs. Grounded Power System with GFCI

The difference in cost between these two systems was $106,821 ($346,065-$239,244). This represented an added cost per OR of $8,902. Adding GFCIs increased material costs, labor, miscellaneous expenses, and taxes for this grounded power scenario. It is worth noting that the laser receptacles did not include ground fault protection in either of the grounded power scenarios, where the laser receptacles in the isolated power scenario included the same "isolated" protection as the 120V circuits.

Summary

Modern operating rooms have many electrical devices whose proper operation and uptime are paramount to positive patient outcomes. The more electrical equipment connected in the operating rooms, the higher the probability for failures including the possibility of ground faults. When a first ground fault occurs during a medical procedure, only isolated power mitigates the interruption of power. GFCIs were never intended to be used for life safety and OR equipment. Manufacturers of GFCIs strictly state not to use these devices in such applications because they do not want to liable for damages due to a power loss. Isolated power also mitigates the risk of electric shock. Current flowing through a patient's body should be of serious concern. Patients can be in grave danger if the current flows through the wrong part of the body, such as the heart. Only isolated power provides a high impedance from ground to the power source. This high impedance helps protect the people in an operating room from risk of electrical shock. Keep in mind that current is required to flow through ground or a person before a GFCI will operate. Consider the danger presented if a surgeon, while performing a delicate procedure, were to suffer a slight electric shock. The severity of the electrical shock would depend on how quickly a GFCI could remove power during a ground fault.

It is the responsibility of the healthcare facility governing bodies to ensure the highest levels of safety to patients and staff. Isolated power offers the highest level of protection and provides the very best possibility for OR equipment continuity of power. The average operating room size used in this study was about 550 square feet. Using a conservative estimate of $450/sf, it is reasonable to estimate a construction cost of $250,000 per operating room. The cost reduction of choosing a grounded power system with GFCI's instead of isolated power for the studied ORs would have reduced the cost of a room by 3.6%. Note that this cost reduction did not consider the additional costs for the healthcare facility's governing body to perform risk assessments required to choose either of the grounded power system options. Given the added benefits of isolated power systems, and a healthy understanding of the additional risks associated grounded power and GFCIs, it is difficult to justify a 3.6% cost reduction when constructing an OR.

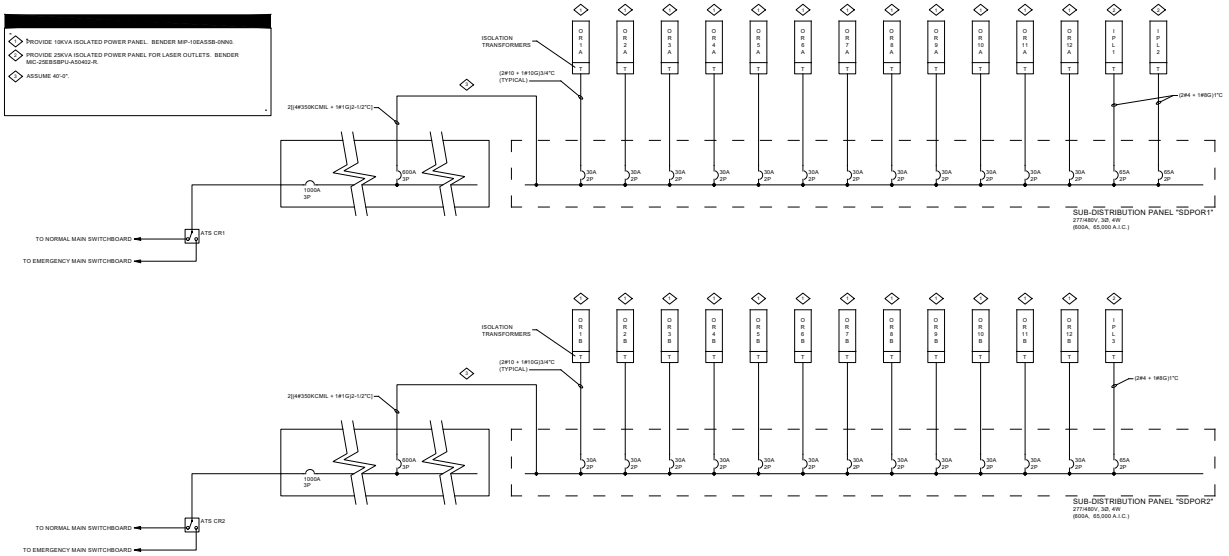


Figure 1: Isolated Power System One-Line Diagram

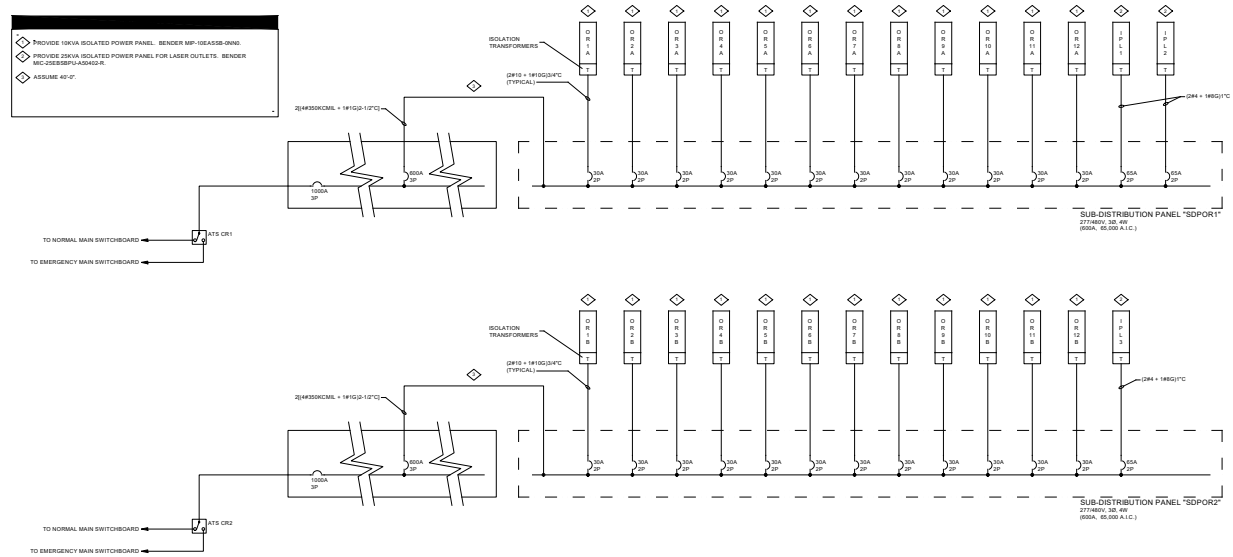
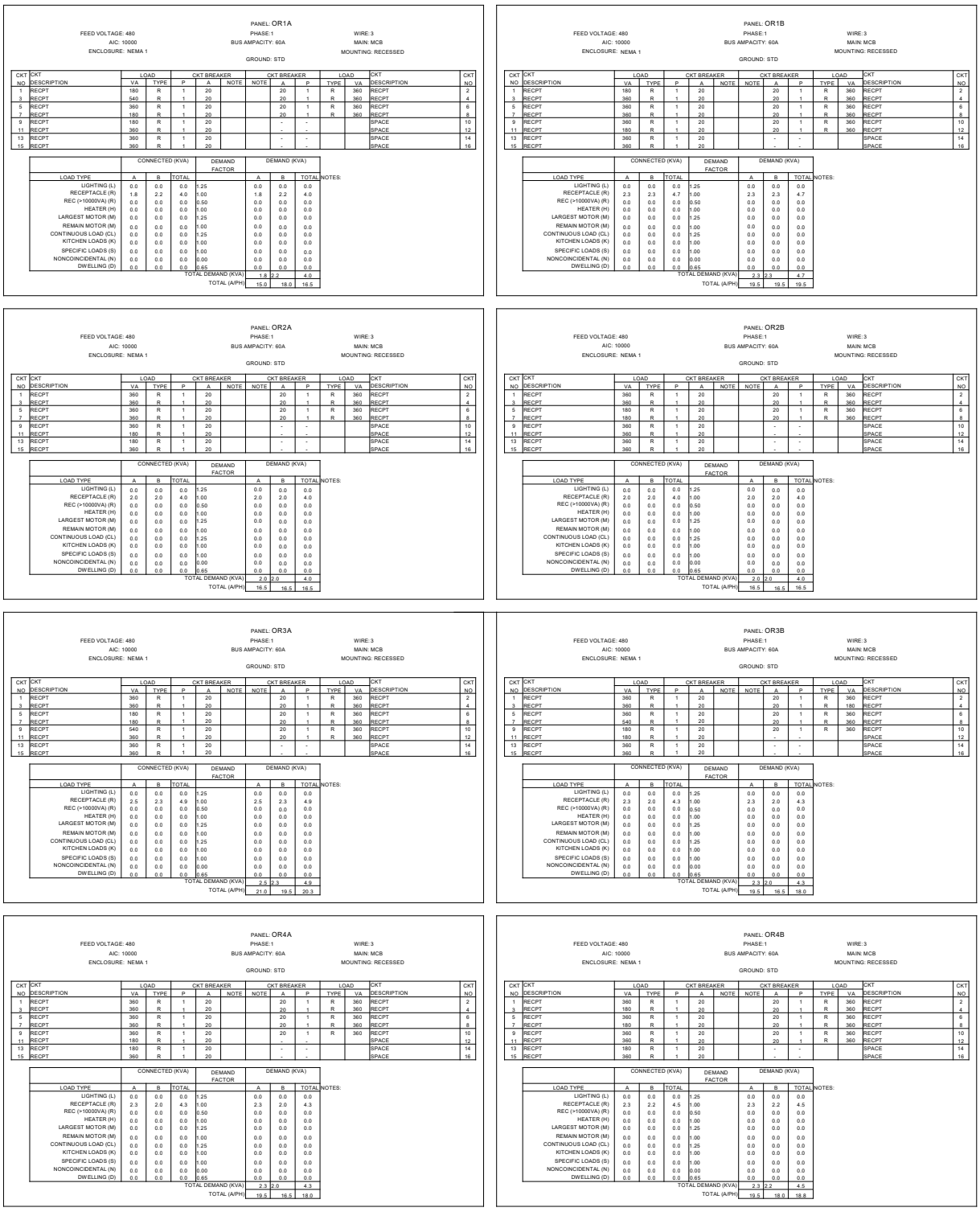


Figure 2: Grounded Power System One-Line Diagram



PANEL: OR1A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	180	R	1	20			20	1	R	360	RECPT	2
3	RECPT	540	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	180	R	1	20			20	1	R	360	RECPT	8
9	RECPT	180	R	1	20			-	-			SPACE	10
11	RECPT	360	R	1	20			-	-			SPACE	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	1.8	2.2	4.0	1.00	1.8	2.2	4.0	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					1.8	2.2	4.0	
TOTAL (A/PH)					15.0	18.0	16.5	

PANEL: OR1B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	180	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	180	R	1	20			20	1	R	360	RECPT	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.3	4.7	1.00	2.3	2.3	4.7	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.3	2.3	4.7	
TOTAL (A/PH)					19.5	19.5	19.5	

PANEL: OR2A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			-	-			SPACE	10
11	RECPT	180	R	1	20			-	-			SPACE	12
13	RECPT	180	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.0	2.0	4.0	1.00	2.0	2.0	4.0	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.0	2.0	4.0	
TOTAL (A/PH)					16.5	16.5	16.5	

PANEL: OR2B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	180	R	1	20			20	1	R	360	RECPT	6
7	RECPT	180	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			-	-			SPACE	10
11	RECPT	360	R	1	20			-	-			SPACE	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.0	2.0	4.0	1.00	2.0	2.0	4.0	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.0	2.0	4.0	
TOTAL (A/PH)					16.5	16.5	16.5	

PANEL: OR3A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	180	R	1	20			20	1	R	360	RECPT	6
7	RECPT	180	R	1	20			20	1	R	360	RECPT	8
9	RECPT	540	R	1	20			20	1	R	360	RECPT	10
11	RECPT	360	R	1	20			20	1	R	360	RECPT	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.5	2.3	4.9	1.00	2.5	2.3	4.9	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.5	2.3	4.9	
TOTAL (A/PH)					21.0	19.5	20.3	

PANEL: OR3B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	180	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	540	R	1	20			20	1	R	360	RECPT	8
9	RECPT	180	R	1	20			20	1	R	360	RECPT	10
11	RECPT	180	R	1	20			-	-			SPACE	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.0	4.3	1.00	2.3	2.0	4.3	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.3	2.0	4.3	
TOTAL (A/PH)					19.5	16.5	18.0	

PANEL: OR4A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	180	R	1	20			-	-			SPACE	12
13	RECPT	180	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.0	4.3	1.00	2.3	2.0	4.3	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.3	2.0	4.3	
TOTAL (A/PH)					19.5	16.5	18.0	

PANEL: OR4B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	180	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	180	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	360	R	1	20			20	1	R	360	RECPT	12
13	RECPT	180	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.2	4.5	1.00	2.3	2.2	4.5	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.3	2.2	4.5	
TOTAL (A/PH)					19.5	18.0	18.8	

Figure 3: Panel Schedules Rooms (1-4)

PANEL: OR5A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	540	R	1	20			20	1	R	360	RECPT	8
9	RECPT	180	R	1	20			20	1	R	360	RECPT	10
11	RECPT	180	R	1	20			20	1	R	360	RECPT	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.5	4.9	1.00	2.3	2.5	4.9	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
				TOTAL DEMAND (KVA)	2.3	2.5	4.9	
				TOTAL (A/PH)	19.5	21.0	20.3	

PANEL: OR5B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	180	R	1	20			20	1	R	360	RECPT	2
3	RECPT	180	R	1	20			20	1	R	360	RECPT	4
5	RECPT	180	R	1	20			20	1	R	360	RECPT	6
7	RECPT	540	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	360	R	1	20			20	1	R	360	RECPT	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	SPACE			-	-			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.2	2.2	4.3	1.00	2.2	2.2	4.3	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
				TOTAL DEMAND (KVA)	2.2	2.2	4.3	
				TOTAL (A/PH)	18.0	18.0	18.0	

PANEL: OR6A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	180	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	360	R	1	20			20	1	R	360	RECPT	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	SPACE			-	-			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.2	4.5	1.00	2.3	2.2	4.5	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
				TOTAL DEMAND (KVA)	2.3	2.2	4.5	
				TOTAL (A/PH)	19.5	18.0	18.8	

PANEL: OR6B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	180	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	180	R	1	20			20	1	R	360	RECPT	10
11	RECPT	360	R	1	20			20	1	R	360	RECPT	12
13	RECPT	180	R	1	20			-	-			SPACE	14
15	RECPT	360	R	-	-			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.2	2.3	4.5	1.00	2.2	2.3	4.5	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
				TOTAL DEMAND (KVA)	2.2	2.3	4.5	
				TOTAL (A/PH)	18.0	19.5	18.8	

PANEL: OR7A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	180	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	180	R	1	20			20	1	R	360	RECPT	12
13	SPACE			-	-			-	-			SPACE	14
15	SPACE			-	-			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.0	2.0	4.0	1.00	2.0	2.0	4.0	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
				TOTAL DEMAND (KVA)	2.0	2.0	4.0	
				TOTAL (A/PH)	16.5	16.5	16.5	

PANEL: OR7B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	180	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	360	R	1	20			20	1	R	360	RECPT	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	180	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.5	2.2	4.7	1.00	2.5	2.2	4.7	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
				TOTAL DEMAND (KVA)	2.5	2.2	4.7	
				TOTAL (A/PH)	21.0	18.0	19.5	

PANEL: OR8A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	180	R	1	20			20	1	R	360	RECPT	2
3	RECPT	180	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	360	R	1	20			20	1	R	360	RECPT	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	SPACE			-	-			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.0	4.3	1.00	2.3	2.0	4.3	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
				TOTAL DEMAND (KVA)	2.3	2.0	4.3	
				TOTAL (A/PH)	19.5	16.5	18.0	

PANEL: OR8B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	180	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	180	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	360	R	1	20			20	1	R	360	RECPT	12
13	SPACE			-	-			-	-			SPACE	14
15	SPACE			-	-			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.0	2.0	4.0	1.00	2.0	2.0	4.0	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
				TOTAL DEMAND (KVA)	2.0	2.0	4.0	
				TOTAL (A/PH)	16.5	16.5	16.5	

Figure 4: Panel Schedules Rooms (5-8)

PANEL: OR9A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	180	R	1	20			20	1	R	360	RECPT	2
3	RECPT	540	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	180	R	1	20			20	1	R	360	RECPT	8
9	RECPT	180	R	1	20			-	-			SPACE	10
11	RECPT	360	R	1	20			-	-			SPACE	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	1.8	2.2	4.0	1.00	1.8	2.2	4.0	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					1.8	2.2	4.0	
TOTAL (A/PH)					15.0	18.0	16.5	

PANEL: OR9B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	180	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	180	R	1	20			20	1	R	360	RECPT	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.3	4.7	1.00	2.3	2.3	4.7	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.3	2.3	4.7	
TOTAL (A/PH)					19.5	19.5	19.5	

PANEL: OR10A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			-	-			SPACE	10
11	RECPT	180	R	1	20			-	-			SPACE	12
13	RECPT	180	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.0	2.0	4.0	1.00	2.0	2.0	4.0	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.0	2.0	4.0	
TOTAL (A/PH)					16.5	16.5	16.5	

PANEL: OR10B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	180	R	1	20			20	1	R	360	RECPT	6
7	RECPT	180	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			-	-			SPACE	10
11	RECPT	360	R	1	20			-	-			SPACE	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.0	2.0	4.0	1.00	2.0	2.0	4.0	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.0	2.0	4.0	
TOTAL (A/PH)					16.5	16.5	16.5	

PANEL: OR11A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	180	R	1	20			20	1	R	360	RECPT	6
7	RECPT	180	R	1	20			20	1	R	360	RECPT	8
9	RECPT	540	R	1	20			20	1	R	360	RECPT	10
11	RECPT	360	R	1	20			20	1	R	360	RECPT	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.5	2.3	4.9	1.00	2.5	2.3	4.9	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.5	2.3	4.9	
TOTAL (A/PH)					21.0	19.5	20.3	

PANEL: OR11B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	180	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	540	R	1	20			20	1	R	360	RECPT	8
9	RECPT	180	R	1	20			20	1	R	360	RECPT	10
11	RECPT	180	R	1	20			-	-			SPACE	12
13	RECPT	360	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.0	4.3	1.00	2.3	2.0	4.3	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.3	2.0	4.3	
TOTAL (A/PH)					19.5	16.5	18.0	

PANEL: OR12A

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	360	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	360	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	180	R	1	20			-	-			SPACE	12
13	RECPT	180	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.0	4.3	1.00	2.3	2.0	4.3	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.3	2.0	4.3	
TOTAL (A/PH)					19.5	16.5	18.0	

PANEL: OR12B

FEED VOLTAGE: 480 | PHASE:1 | WIRE:3
AIC: 10000 | BUS AMPACITY: 60A | MAIN: MCB
ENCLOSURE: NEMA 1 | MOUNTING: RECESSED
GROUND: STD

CKT NO	CKT DESCRIPTION	LOAD VA	LOAD TYPE	CKT BREAKER P	CKT BREAKER A	CKT BREAKER NOTE	CKT BREAKER NOTE	CKT BREAKER A	CKT BREAKER P	LOAD TYPE	LOAD VA	CKT DESCRIPTION	CKT NO
1	RECPT	360	R	1	20			20	1	R	360	RECPT	2
3	RECPT	180	R	1	20			20	1	R	360	RECPT	4
5	RECPT	360	R	1	20			20	1	R	360	RECPT	6
7	RECPT	180	R	1	20			20	1	R	360	RECPT	8
9	RECPT	360	R	1	20			20	1	R	360	RECPT	10
11	RECPT	360	R	1	20			20	1	R	360	RECPT	12
13	RECPT	180	R	1	20			-	-			SPACE	14
15	RECPT	360	R	1	20			-	-			SPACE	16

LOAD TYPE	CONNECTED (KVA) A	CONNECTED (KVA) B	CONNECTED (KVA) TOTAL	DEMAND FACTOR	DEMAND (KVA) A	DEMAND (KVA) B	DEMAND (KVA) TOTAL	NOTES:
LIGHTING (L)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
RECEPTACLE (R)	2.3	2.2	4.5	1.00	2.3	2.2	4.5	
REC (>10000VA) (R)	0.0	0.0	0.0	0.50	0.0	0.0	0.0	
HEATER (H)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
LARGEST MOTOR (M)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
REMAIN MOTOR (M)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
CONTINUOUS LOAD (CL)	0.0	0.0	0.0	1.25	0.0	0.0	0.0	
KITCHEN LOADS (K)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
SPECIFIC LOADS (S)	0.0	0.0	0.0	1.00	0.0	0.0	0.0	
NONCOINCIDENTAL (N)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	
DWELLING (D)	0.0	0.0	0.0	0.65	0.0	0.0	0.0	
TOTAL DEMAND (KVA)					2.3	2.2	4.5	
TOTAL (A/PH)					19.5	18.0	18.8	

Figure 5: Panel Schedules Rooms (9-12)

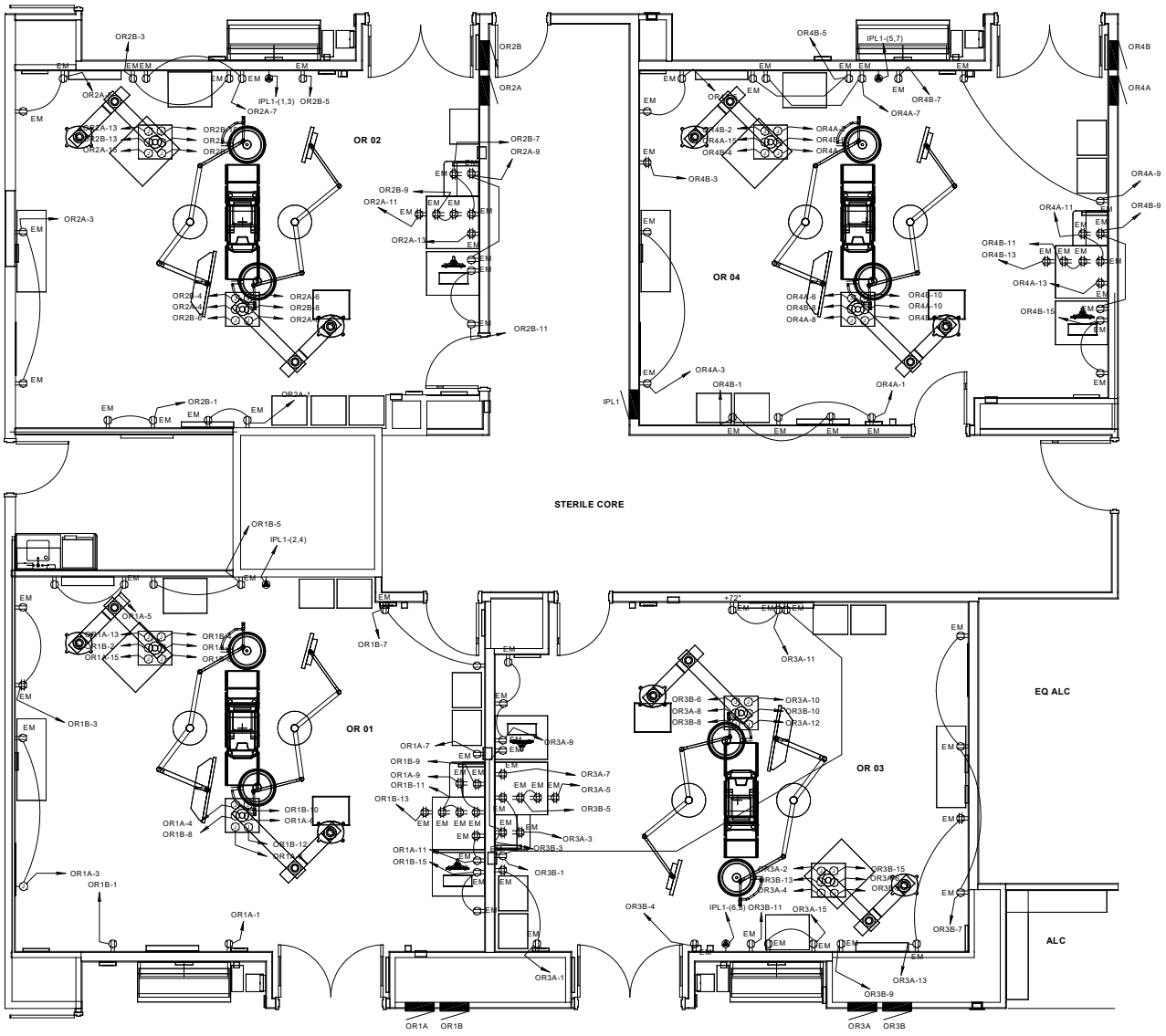


Figure 6: Room Power Plans (1-4)

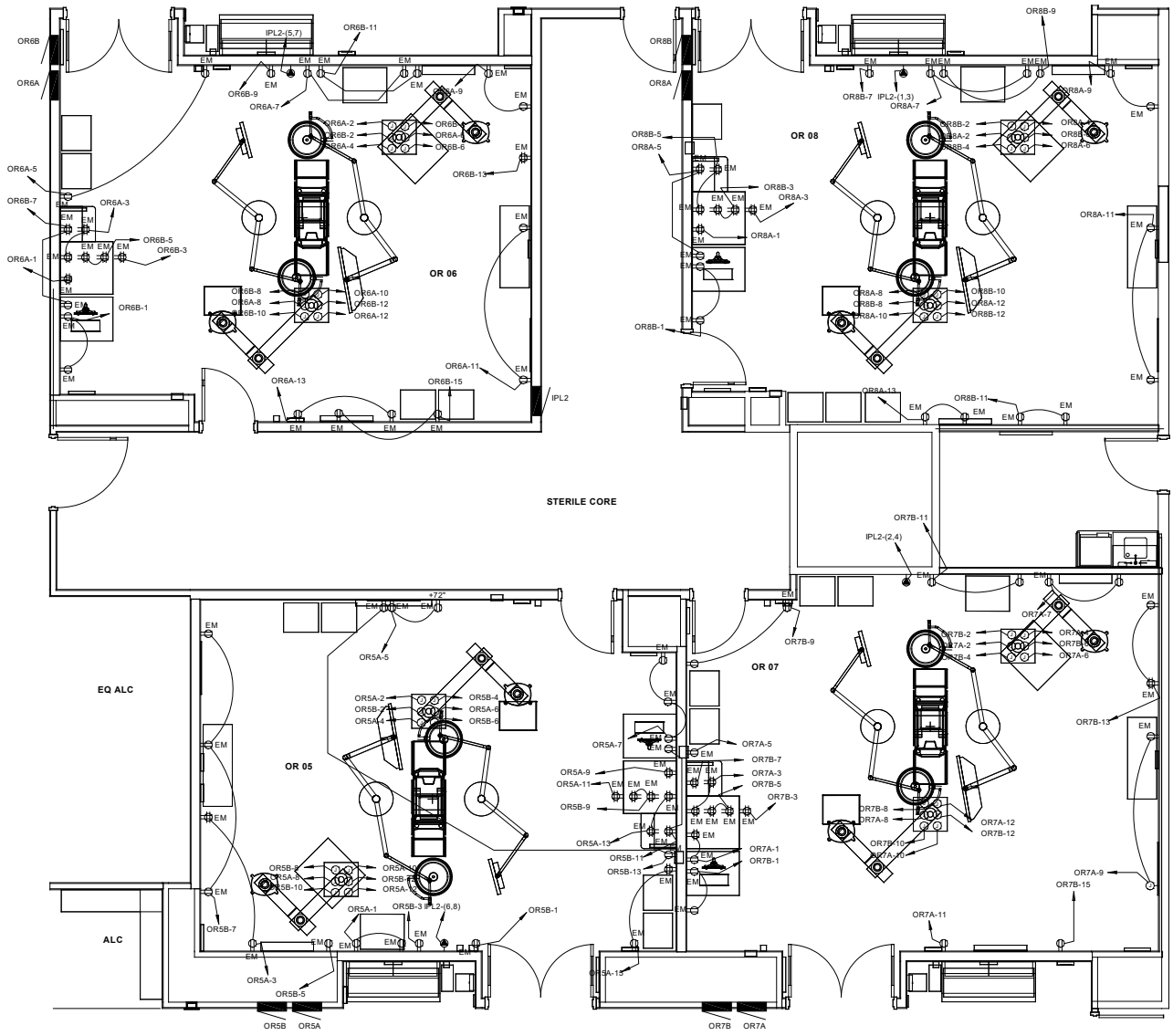


Figure 7: Room Power Plans (5-8)

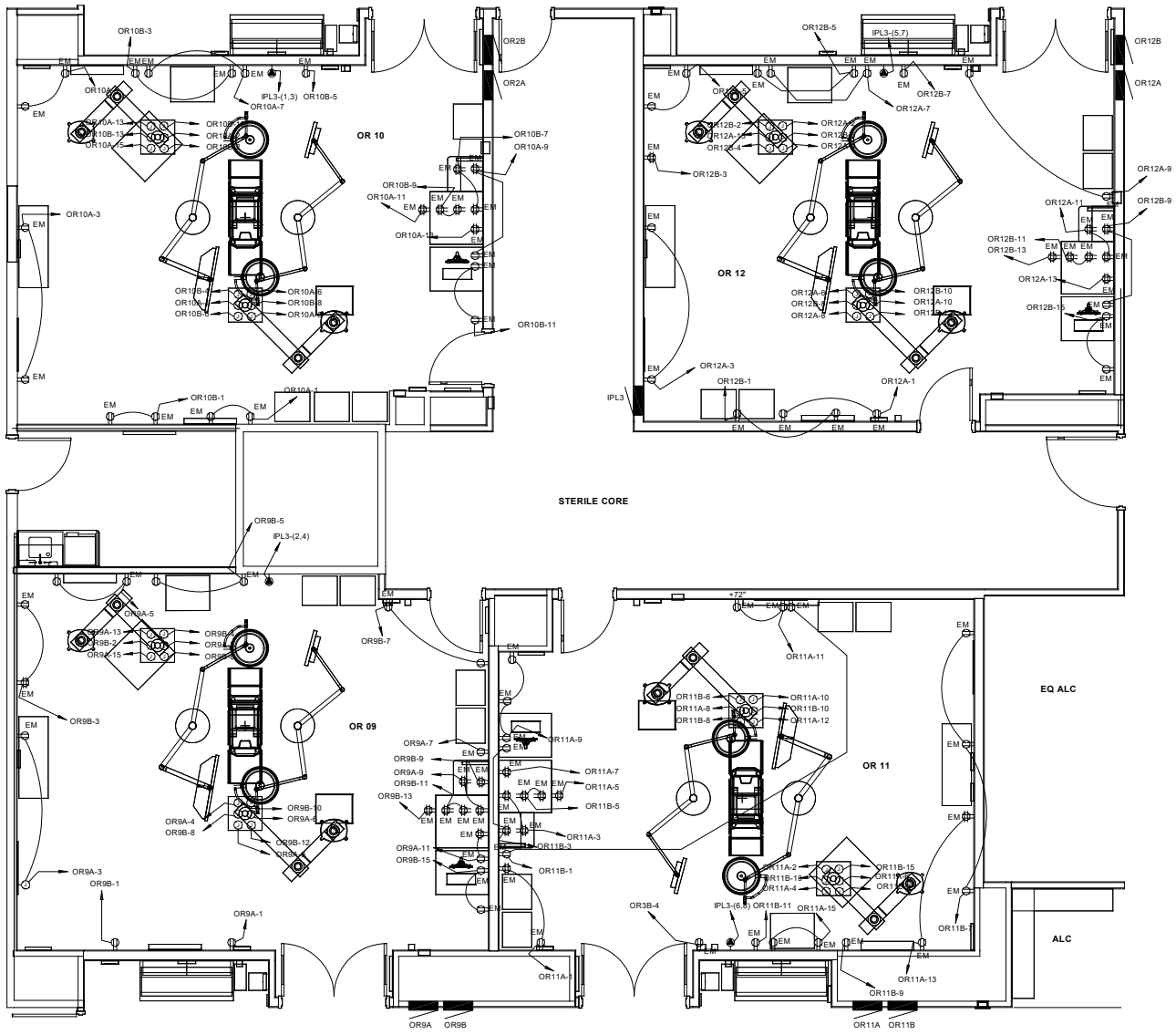


Figure 8: Room Power Plans (9-12)

Title Page

Due Date: 11/25/20
Bid To Gen.Contractor: Y
Bid Direct to Customer: N
Bid Bond: N
Performance Bond: N
Sales Tax Material $: 8.2500%
Sales Tax Labor %: 0.0000%

Job Information:
Labor Rates current for 6/1/2020 Labor Agreement
Added Equipment Rental Rate Worksheet Page
Adjusted Indirect Labor Rates
Adjusted State Permit Fee
1% Material Mark-up added for consumables

** LABOR ADJUSTED TO INCLUDE SICK LEVEL - $1.11/HR jw

Recap Page

WS	A	T	Description/Location	Mult	Material	Labor Hrs	Ph.	$$/SqFt	Hrs/SqFt
1	Y	Q	One Line Normal Panels Qu	1.00	$194,934.44	0.00	0	$0.00	0.00
2	Y	R	One Line Normal Panels	1.00	$4,846.54	425.57	0	$0.00	0.00
3	Y	R	Branch Circuiting Normal	1.00	$25,111.67	1191.17	0	$0.00	0.00

Raw Material = $29,958.21
Raw Labor = 1616.74
Hours Quote/Subs Total = $194,934.44

Completed Raw Material = $0.00
Completed Raw Labor = 0.00 Hours
Completed Quotes = $0.00

Extended Material = $37,802.39
Extended Labor = $113,328.54
Estimate Total = $346,065.37

Job Factors Page

Labor Factor Category/Description

Raw Labor Hours = 1616.74
Total Labor Hours = 1616.74

Labor Distribution Page

Labor Category/Description	Percent	Hours	Rate	Cost	Locked
JOURNEYMAN	100.00	1616.74	$57.80	$93,447.57	N

Total Labor Hours = 1616.74 Hours
Total Labor Hours Allocated= 1616.74 Hours
Total Labor Cost = $93,447.57
Average Labor Cost = $57.80

Job Expense Page

Expense Category/Description	Percent	Cost	Locked
BEC TOOLS	5.00	$4,672.38	N

Total Labor Cost = $93,447.57
Labor + Raw Material = $123,405.78
Total Job Expense = $4,672.38
Overall Job Expense Percentage 3.79%

Summary Page

Raw Material Cost		$29,958.21
Material Tax	8.2500%	$2,471.55
Material Markup	1.0000%	$299.58
Material Total		$32,729.34
Labor Cost		$93,447.57
Labor Tax	0.0000%	$0.00
Labor Markup	0.0000%	$0.00
Labor Total		$93,447.57
Job Expense		$4,672.38
Job Cost		$130,849.29
Overhead:	10.0000%	$13,084.93
SubTotal1:		$143,934.00
Profit:	5.0000%	$7,196.71
SubTotal2:		$151,130.93

Markup Category	Percent	Dollars	Lck
Special Insurance	0.00	$0.00	N
Performance Bond	0.00	$0.00	N
Taxes	0.00	$0.00	N
Adjustments	0.00	$0.00	N
Summary Markups Total:		$0.00	
Quotes/Subcontract Total		$194,934.44	
Active Linked Estimates			
Estimate Total:		$346,065.00	

Labor/Material Ratio = 74:26
Square Footage Calculations Not Performed

Figure 9: Supplier Estimate Report for the Isolated Power System Equipment and Materials

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	Distribution Boards SDPOR1 & SDPOR2 120/208V 700A							
I	9769	8	SWG-MLO/MAIN 600V 600A	2.00	0.00	E	0.00	14.00	E	28.00
I	7820	37	TER TERMINATION-350 MCM	16.00	0.00	E	0.00	0.40	E	6.40
I	7813	37	TER TERMINATION- 1 AWG	4.00	0.00	E	0.00	0.18	E	0.72
I	7808	37	TER TERMINATION- 8 AWG	72.00	0.00	E	0.00	0.12	E	8.64
I	7807	37	TER TERMINATION- 10 AWG	24.00	0.00	E	0.00	0.10	E	2.40
		0	Qty (24) Standard 120/240V100A Panels OR1A thru OR12A and OR1B thru OR12B							
I	9813	7	PANEL 120/240V 100A	24.00	0	E	0.00	4.00	E	96
I	7810	37	TER TERMINATION- 4 AWG	72.00	0	E	0.00	0.15	E	10.80
I	7808	37	TER TERMINATION- 8 AWG	1032.00	0	E	0.00	0.12	E	123.84
		0	Qty (3) Isolation Panels IPL1 - IPL2	0						
I	9813	7	PANEL 120/240V 100A	3.00	0	E	0.00	4.00	E	12.00
I	7810	37	TER TERMINATION- 4 AWG	9.00	0	E	0.00	0.15	E	1.35
I	7808	37	TER TERMINATION- 8 AWG	126.00	0	E	0.00	0.12	E	15.12
		0	480V Main Panel to Distribution Boards SDPOR1 & SDPOR2							
		0	Qty (2) Feeders							
I	1854	2	EM-2 1/2 EMT-CONDUIT	40.00	425.76	C	170.30	11.00	C	4.40
I	1874	2	EM-2 1/2 EMT-90-ELLS	8.00	3990.75	C	319.26	0.45	E	3.60
I	1932	2	EMC 2 1/2 CAST COMP COUP	12.00	26.15	E	313.80	0.00	C	0.00
I	1952	2	EMC 2 1/2 CAST COMP CONN	8.00	20.19	E	161.52	25.00	C	2.00
I	524	2	BU-2 1/2 PLASTIC BUSHING	8.00	140	C	11.20	22.00	C	1.76
I	3878	2	HA-2 1/2 MINERALLAC	12.00	141.08	C	16.93	14.00	C	1.68
I	8214	4	WC-THHN-STRA #350MCM	150.00	5597	M	839.55	27.50	M	4.13
I	8202	4	WC-THHN-STRA #1	60.00	1447	M	86.82	14.00	M	0.84
A	805	0	MTR-200 HP 480V. FLEX	4.00	407.52	E	1630.08	5.00	E	20.00
I	7811	37	TER TERMINATION- 3 AWG	4.00	0	E	0.00	0.16	E	0.64
I	7820	37	TER TERMINATION-350 MCM	16.00	0	E	0.00	0.40	E	6.40
		0	Feeders from SDPOR1 & SDPOR2 to Panels OR1A thru OR12A & OR1B thru OR12B							
		0	Typical (3) #8 & (1) #10 in 3/4" Conduit 25' each							
I	1844	1	EM-3/4 EMT-CONDUIT	600.00	70.2	C	421.20	4.50	C	27.00
I	50193	1	EMS 3/4 STEEL SS COUP	60.00	0.45	E	27.00	0.00	C	0.00
I	50203	1	EMS 3/4 STEEL SS CONN	48.00	0.39	E	18.72	7.00	C	3.36
I	3868	1	HA-3/4 MINERALLAC	78.00	43.26	C	33.74	6.00	C	4.68
I	4039	38	KO-3/4 LABOR ONLY	48.00	0	E	0.00	0.18	E	8.64
I	8180	3	WC-THHN-SOLID #10	2400.00	197.42	M	473.81	6.50	M	15.60
		0	Feeders from SDPOR1 & SDPOR2 to Panels IPL1 - IPL2							
I	1846	1	EM-1 EMT-CONDUIT	75.00	120.3	C	90.23	5.75	C	4.31
I	50194	1	EMS 1 STEEL SS COUP	12.00	0.74	E	8.88	0.00	C	0.00
I	50204	1	EMS 1 STEEL SS CONN	6.00	0.72	E	4.32	9.00	C	0.54
I	3870	1	HA-1 MINERALLAC	12.00	50.58	C	6.07	10.00	C	1.20
I	4040	38	KO-1 LABOR ONLY	6.00	0	E	0.00	0.24	E	1.44
I	8196	4	WC-THHN-STRA #4	250.00	745	M	186.25	12.00	M	3.00
I	8192	3	WC-THHN-STRA #8	85.00	316	M	26.86	9.00	M	0.77
I	7808	37	TER TERMINATION- 8 AWG	6.00	0	E	0.00	0.12	E	0.72
I	7810	37	TER TERMINATION- 4 AWG	24.00	0	E	0.00	0.15	E	3.60

Raw Material Total = $4,846.54
Raw Labor Hours = 425.57 Hours

Figure 10: Supplier Cost for the Isolated Power System Equipment, Materials and Labor (Upstream Breakers, Feeders, and Isolated Power Panels)

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-1							
		0	Panel OR-1A							
A	146	0	DE2-DUP G/S HOS 1G FUR	6.00	19.40	E	116.37	0.86	E	5.13
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	60.00	1.34	E	80.56	0.07	E	4.36
		0	Panel OR-1B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	80.00	1.89	E	151.12	0.09	E	7.08
A	246	0	EM-1/2 EMT 3/10 SOL	165.00	1.13	E	185.70	0.07	E	10.80
		0	OR-2							
		0	Panel OR-2A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	170.00	1.13	E	191.33	0.07	E	11.13
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-2B							
A	146	0	DE2-DUP G/S HOS 1G FUR	7.00	19.40	E	135.77	0.86	E	5.99
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	OR-3							
		0	Panel OR-3A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	6.00	27.25	E	163.50	1.02	E	6.12
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	105.00	1.89	E	198.35	0.09	E	9.30
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	55.00	1.34	E	73.84	0.07	E	3.99
		0	Panel OR-3B							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	10.00	1.89	E	18.89	0.09	E	0.89
A	246	0	EM-1/2 EMT 3/10 SOL	225.00	1.13	E	253.23	0.07	E	14.73

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-4							
		0	Panel OR-4A							
A	146	0	DE2-DUP G/S HOS 1G FUR	10.00	19.40	E	193.95	0.86	E	8.55
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	125.00	1.89	E	236.13	0.09	E	11.07
A	246	0	EM-1/2 EMT 3/10 SOL	400.00	1.13	E	450.19	0.07	E	26.18
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-4B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	5.00	27.25	E	136.25	1.02	E	5.10
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	70.00	1.89	E	132.23	0.09	E	6.20
A	246	0	EM-1/2 EMT 3/10 SOL	200.00	1.13	E	225.09	0.07	E	13.09
		0	OR-5							
		0	Panel OR-5A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	6.00	27.25	E	163.50	1.02	E	6.12
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	105.00	1.89	E	198.35	0.09	E	9.30
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	55.00	1.34	E	73.84	0.07	E	3.99
		0	Panel OR-5B							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	10.00	1.89	E	18.89	0.09	E	0.89
A	246	0	EM-1/2 EMT 3/10 SOL	225.00	1.13	E	253.23	0.07	E	14.73
		0	OR-6							
		0	Panel OR-6A							
A	146	0	DE2-DUP G/S HOS 1G FUR	10.00	19.40	E	193.95	0.86	E	8.55
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	125.00	1.89	E	236.13	0.09	E	11.07
A	246	0	EM-1/2 EMT 3/10 SOL	400.00	1.13	E	450.19	0.07	E	26.18
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-6B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	5.00	27.25	E	136.25	1.02	E	5.10
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	70.00	1.89	E	132.23	0.09	E	6.20
A	246	0	EM-1/2 EMT 3/10 SOL	200.00	1.13	E	225.09	0.07	E	13.09

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-7							
		0	Panel OR-7A							
A	146	0	DE2-DUP G/S HOS 1G FUR	6.00	19.40	E	116.37	0.86	E	5.13
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	60.00	1.34	E	80.56	0.07	E	4.36
		0	Panel OR-7B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	80.00	1.89	E	151.12	0.09	E	7.08
A	246	0	EM-1/2 EMT 3/10 SOL	165.00	1.13	E	185.70	0.07	E	10.80
		0	OR-8							
		0	Panel OR-8A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	170.00	1.13	E	191.33	0.07	E	11.13
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-8B							
A	146	0	DE2-DUP G/S HOS 1G FUR	7.00	19.40	E	135.77	0.86	E	5.99
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	OR-9							
		0	Panel OR-9A							
A	146	0	DE2-DUP G/S HOS 1G FUR	6.00	19.40	E	116.37	0.86	E	5.13
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	60.00	1.34	E	80.56	0.07	E	4.36
		0	Panel OR-9B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	80.00	1.89	E	151.12	0.09	E	7.08
A	246	0	EM-1/2 EMT 3/10 SOL	165.00	1.13	E	185.70	0.07	E	10.80

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-10							
		0	Panel OR-10A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	170.00	1.13	E	191.33	0.07	E	11.13
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-10B							
A	146	0	DE2-DUP G/S HOS 1G FUR	7.00	19.40	E	135.77	0.86	E	5.99
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	OR-11							
		0	Panel OR-11A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	6.00	27.25	E	163.50	1.02	E	6.12
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	105.00	1.89	E	198.35	0.09	E	9.30
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	55.00	1.34	E	73.84	0.07	E	3.99
		0	Panel OR-11B							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	10.00	1.89	E	18.89	0.09	E	0.89
A	246	0	EM-1/2 EMT 3/10 SOL	225.00	1.13	E	253.23	0.07	E	14.73
		0	OR-12							
		0	Panel OR-12A							
A	146	0	DE2-DUP G/S HOS 1G FUR	10.00	19.40	E	193.95	0.86	E	8.55
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	125.00	1.89	E	236.13	0.09	E	11.07
A	246	0	EM-1/2 EMT 3/10 SOL	400.00	1.13	E	450.19	0.07	E	26.18
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-12B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	5.00	27.25	E	136.25	1.02	E	5.10
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	70.00	1.89	E	132.23	0.09	E	6.20
A	246	0	EM-1/2 EMT 3/10 SOL	200.00	1.13	E	225.09	0.07	E	13.09

Raw Material Total = $25,111.67
Raw Labor Hours = 1191.17 Hours

Figure 11: Supplier Cost for the Isolated Power System Materials and Labor (Branch Circuit Wiring, and Receptacles)

Title Page

Due Date: 12/03/20
Bid To Gen.Contractor: Y
Bid Direct to Customer: N
Bid Bond: N
Performance Bond: N
Sales Tax Material $: 8.2500%
Sales Tax Labor %: 0.0000%

Job Information:
Labor Rates current for 6/1/2020 Labor Agreement
Added Equipment Rental Rate Worksheet Page
Adjusted Indirect Labor Rates
Adjusted State Permit Fee
1% Material Mark-up added for consumables

** LABOR ADJUSTED TO INCLUDE SICK LEVEL - $1.11/HR jw

Recap Page

WS	A	T	Description/Location	Mult	Material	Labor Hrs	Ph.	$$/SqFt	Hrs/SqFt
1	Y	Q	One Line Normal Panels Qu	1.00	$56,474.03	0.00	0	$0.00	0.00
2	Y	R	One Line Normal Panels	1.00	$13,756.33	550.43	0	$0.00	0.00
3	Y	R	Branch Circuiting Normal	1.00	$30,314.73	1263.62	0	$0.00	0.00

Raw Material = $44,071.06
Raw Labor = 1814.05 Hours
Quote/Subs Total = $56,474.03
Completed Raw Material = $0.00
Completed Raw Labor = 0.00 Hours
Completed Quotes = $0.00

Extended Material = $55,610.52
Extended Labor = $127,159.37
Estimate Total = $239,243.92

Job Factors Page

Labor Factor Category/Description

Raw Labor Hours = 1814.05
Total Labor Hours = 1814.05

Labor Distribution Page

Labor Category/Description	Percent	Hours	Rate	Cost	Locked
JOURNEYMAN	100.00	1814.05	$57.80	$104,852.09	N

Total Labor Hours = 1814.05 Hours
Total Labor Hours Allocated= 1814.05 Hours
Total Labor Cost = $104,852.09
Average Labor Cost = $57.80

Job Expense Page

Expense Category/Description	Percent	Cost	Locked
BEC TOOLS	5.00	$5,242.60	N

Total Labor Cost = $104,852.09
Labor + Raw Material = $148,923.15
Total Job Expense = $5,242.60
Overall Job Expense Percentage 3.52%

Summary Page

Raw Material Cost		$44,071.06
Material Tax	8.2500%	$3,635.86
Material Markup	1.0000%	$440.71
Material Total		$48,147.63
Labor Cost		$104,852.09
Labor Tax	0.0000%	$0.00
Labor Markup	0.0000%	$0.00
Labor Total		$104,852.09
Job Expense		$5,242.60
Job Cost		$158,242.33
Overhead:	10.0000%	$15,824.23
SubTotal1:		$174,066.56
Profit:	5.0000%	$8,703.33
SubTotal2:		$182,769.89

Markup Category	Percent	Dollars	Lck
Special Insurance	0.00	$0.00	N
Performance Bond	0.00	$0.00	N
Taxes	0.00	$0.00	N
Adjustments	0.00	$0.00	N
Summary Markups Total:		$0.00	
Quotes/Subcontract Total		$56,474.03	
Active Linked Estimates			
Estimate Total:		$239,243.92	

Labor/Material Ratio = 69: 31
Square Footage Calculations Not Performed

Figure 12: Supplier Cost Summary for the Grounded Power System (With GFCIs) Equipment and Materials

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	Distribution Boards SDPOR1 & SDPOR2 120/208V 700A							
I	9760	8	SWG-MLO/MAIN 300V 800A	2.00	0.00	E	0.00	15.00	E	30.00
I	7822	37	TER TERMINATION-500 MCM	16.00	0.00	E	0.00	0.63	E	10.08
I	7812	37	TER TERMINATION- 2 AWG	4.00	0.00	E	0.00	0.17	E	0.68
I	7808	37	TER TERMINATION- 8 AWG	72.00	0.00	E	0.00	0.12	E	8.64
I	7807	37	TER TERMINATION- 10 AWG	24.00	0.00	E	0.00	0.10	E	2.40
		0	Qty (24) Standard 120/240V 100A Panels OR1A thru OR12A and OR1B thru OR12B							
I	9813	7	PANEL 120/240V 100A	24.00	0	E	0.00	4.00	E	96.00
I	7811	37	TER TERMINATION- 3 AWG	72.00	0	E	0.00	0.16	E	11.52
I	7807	37	TER TERMINATION- 10 AWG	1032.00	0	E	0.00	0.10	E	103.20
		0	480V Panel to 225KVA Transformer							
		0	Qty (2) Feeders							
I	1856	2	EM-3 EMT-CONDUIT	20.00	539.76	C	107.95	13.00	C	2.60
I	1876	2	EM-3 EMT-90-ELLS	4.00	5950.38	C	238.02	0.52	E	2.08
I	1934	2	EMC 3 CAST COMP COUP	6.00	30.72	E	184.32	0.00	C	0.00
I	1954	2	EMC 3 CAST COMP CONN	4.00	24.81	E	99.24	30.00	C	1.20
I	526	2	BU-3 PLASTIC BUSHING	4.00	150.15	C	6.01	24.00	C	0.96
I	3880	2	HA-3 MINERALLAC	6.00	183.55	C	11.01	16.00	C	0.96
I	8216	4	WC-THHN-STRA #500MCM	75.00	8045	M	603.38	30.00	M	2.25
I	8198	4	WC-THHN-STRA #3	30.00	939	M	28.17	12.50	M	0.38
A	805	0	MTR-200 HP 480V. FLEX	2.00	407.52	E	815.04	5.00	E	10.00
I	7811	37	TER TERMINATION- 3 AWG	2.00	0	E	0.00	0.16	E	0.32
I	7822	37	TER TERMINATION-500 MCM	6.00	0	E	0.00	0.63	E	3.78
		0	225 KVA Transformer Qty (2)							
I	9913	8	TRANS- 225KVA 3P DRY	2.00	0	E	0.00	36.00	E	72.00
I	4045	38	KO-3 LABOR ONLY	2.00	0	E	0.00	0.96	E	1.92
I	4046	38	KO-3 1/2 LABOR ONLY	4.00	0	E	0.00	1.10	E	4.40
I	4902	4	LU-SOLDERLESS-CU 0 AWG	4.00	1.78	E	7.12	0.40	E	1.60
I	4904	4	LU-SOLDERLESS-CU 250MCM	4.00	4.21	E	16.84	0.65	E	2.60
I	4906	4	LU-SOLDERLESS-CU 500MCM	24.00	10.59	E	254.16	0.83	E	19.92
		0	225KVA Transformer to Dist Board SDPOR1 & SDPOR2							
		0	Qty (2) Feeders							
I	1858	2	EM-3 1/2 EMT-CONDUIT	120.00	713.28	C	855.94	15.00	C	18.00
I	1878	2	EM-3 1/2 EMT-90-ELLS	8.00	7495.71	C	599.66	0.63	E	5.04
I	1936	2	EMC 3 1/2 CAST COMP COUP	20.00	44.95	E	899.00	0.00	C	0.00
I	1956	2	EMC 3 1/2 CAST COMP CONN	8.00	33.2	E	265.60	37.00	C	2.96
I	528	2	BU-3 1/2 PLASTIC BUSHING	8.00	203.13	C	16.25	30.00	C	2.40
I	3882	2	HA-3 1/2 MINERALLAC	24.00	217.38	C	52.17	18.00	C	4.32
I	8216	4	WC-THHN-STRA #500MCM	528.00	8045	M	4247.76	30.00	M	15.84
I	8206	4	WC-THHN-STRA #2/0	130.00	2183	M	283.79	20.00	M	2.60
I	783	0	MTR-150 HP 208V. FLEX	4.00	727.07	E	2908.27	8.25	E	32.99
I	7815	37	TER TERMINATION-2/0 AWG	4.00	0	E	0.00	0.23	E	0.92
I	7822	37	TER TERMINATION-500 MCM	16.00	0	E	0.00	0.63	E	10.08
		0	Feeders from SDPOR1 & SDPOR2 to Panels OR1A thru OR12A & OR1B thru OR12B							
		0	Typical (3) #8 & (1) #10 in 3/4" Conduit 25' each							
I	1844	1	EM-3/4 EMT-CONDUIT	600.00	70.2	C	421.20	4.50	C	27.00
I	50193	1	EMS 3/4 STEEL SS COUP	60.00	0.45	E	27.00	0.00	C	0.00
I	50203	1	EMS 3/4 STEEL SS CONN	48.00	0.39	E	18.72	7.00	C	3.36
I	3868	1	HA-3/4 MINERALLAC	78.00	43.26	C	33.74	6.00	C	4.68
I	4039	38	KO-3/4 LABOR ONLY	48.00	0	E	0.00	0.18	E	8.64
I	8192	3	WC-THHN-STRA #8	1980.00	316	M	625.68	9.00	M	17.82
	8180	3	WC-THHN-SOLID #10	660.00	197.42	M	130.30	6.50	M	4.29

Raw Material Total = $13,756.33
Raw Labor Hours = 550.43 Hours

Figure 13: Supplier Cost for the Grounded Power System (With GFCIs) Equipment, Materials and Labor (Upstream Breakers, Feeders, and Isolated Power Panels)

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-1							
		0	Panel OR-1A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	60.00	1.34	E	80.56	0.07	E	4.36
		0	Panel OR-1B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	80.00	1.89	E	151.12	0.09	E	7.08
A	246	0	EM-1/2 EMT 3/10 SOL	165.00	1.13	E	185.70	0.07	E	10.80
		0	OR-2							
		0	Panel OR-2A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	170.00	1.13	E	191.33	0.07	E	11.13
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-2B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	OR-3							
		0	Panel OR-3A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	105.00	1.89	E	198.35	0.09	E	9.30
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	55.00	1.34	E	73.84	0.07	E	3.99
		0	Panel OR-3B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	10.00	1.89	E	18.89	0.09	E	0.89
A	246	0	EM-1/2 EMT 3/10 SOL	225.00	1.13	E	253.23	0.07	E	14.73

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-4							
		0	Panel OR-4A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	125.00	1.89	E	236.13	0.09	E	11.07
A	246	0	EM-1/2 EMT 3/10 SOL	400.00	1.13	E	450.19	0.07	E	26.18
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-4B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	70.00	1.89	E	132.23	0.09	E	6.20
A	246	0	EM-1/2 EMT 3/10 SOL	200.00	1.13	E	225.09	0.07	E	13.09
		0	OR-5							
		0	Panel OR-5A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	105.00	1.89	E	198.35	0.09	E	9.30
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	55.00	1.34	E	73.84	0.07	E	3.99
		0	Panel OR-5B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	10.00	1.89	E	18.89	0.09	E	0.89
A	246	0	EM-1/2 EMT 3/10 SOL	225.00	1.13	E	253.23	0.07	E	14.73
		0	OR-6							
		0	Panel OR-6A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	125.00	1.89	E	236.13	0.09	E	11.07
A	246	0	EM-1/2 EMT 3/10 SOL	400.00	1.13	E	450.19	0.07	E	26.18
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-6B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	70.00	1.89	E	132.23	0.09	E	6.20
A	246	0	EM-1/2 EMT 3/10 SOL	200.00	1.13	E	225.09	0.07	E	13.09

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-7							
		0	Panel OR-7A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	60.00	1.34	E	80.56	0.07	E	4.36
		0	Panel OR-7B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	80.00	1.89	E	151.12	0.09	E	7.08
A	246	0	EM-1/2 EMT 3/10 SOL	165.00	1.13	E	185.70	0.07	E	10.80
		0	OR-8							
		0	Panel OR-8A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	170.00	1.13	E	191.33	0.07	E	11.13
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-8B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	OR-9							
		0	Panel OR-9A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	60.00	1.34	E	80.56	0.07	E	4.36
		0	Panel OR-9B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	80.00	1.89	E	151.12	0.09	E	7.08
A	246	0	EM-1/2 EMT 3/10 SOL	165.00	1.13	E	185.70	0.07	E	10.80

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-10							
		0	Panel OR-10A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	170.00	1.13	E	191.33	0.07	E	11.13
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-10B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	OR-11							
		0	Panel OR-11A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	105.00	1.89	E	198.35	0.09	E	9.30
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	55.00	1.34	E	73.84	0.07	E	3.99
		0	Panel OR-11B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	10.00	1.89	E	18.89	0.09	E	0.89
A	246	0	EM-1/2 EMT 3/10 SOL	225.00	1.13	E	253.23	0.07	E	14.73
		0	OR-12							
		0	Panel OR-12A							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	125.00	1.89	E	236.13	0.09	E	11.07
A	246	0	EM-1/2 EMT 3/10 SOL	400.00	1.13	E	450.19	0.07	E	26.18
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-12B							
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	28.29	E	169.71	0.88	E	5.28
A	146	0	DE2-GFI I/I SPE 1G FUR	6.00	53.25	E	319.50	1.50	E	9.00
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	70.00	1.89	E	132.23	0.09	E	6.20
A	246	0	EM-1/2 EMT 3/10 SOL	200.00	1.13	E	225.09	0.07	E	13.09

Raw Material Total = $30,314.73
Raw Labor Hours = 1263.62 Hours

Figure 14: Supplier Cost for the Grounded Power System (With GFCIs) Materials and Labor (Branch Circuit Wiring, and Receptacles)

Title Page

Due Date: 12/03/20
Bid To Gen.Contractor: Y
Bid Direct to Customer: N
Bid Bond: N
Performance Bond: N
Sales Tax Material $: 8.2500%
Sales Tax Labor %: 0.0000%

Job Information:
Labor Rates current for 6/1/2020 Labor Agreement
Added Equipment Rental Rate Worksheet Page
Adjusted Indirect Labor Rates
Adjusted State Permit Fee
1% Material Mark-up added for consumables

** LABOR ADJUSTED TO INCLUDE SICK LEVEL - $1.11/HR jw

Recap Page

WS	A	T	Description/Location	Mult	Material	Labor Hrs	Ph.	$$/SqFt	Hrs/SqFt
1	Y	Q	One Line Normal Panels Qu	1.00	$56,474.03	0.00	0	$0.00	0.00
2	Y	R	One Line Normal Panels	1.00	$13,756.33	550.43	0	$0.00	0.00
3	Y	R	Branch Circuiting Normal	1.00	$25,111.67	1191.17	0	$0.00	0.00

Raw Material = $38,868.00
Raw Labor = 1741.60
Hours Quote/Subs Total = $56,474.03
Completed Raw Material = $0.00
Completed Raw Labor = 0.00 Hours
Completed Quotes = $0.00

Extended Material = $49,045.10
Extended Labor = $122,080.85
Estimate Total = $227,599.98

Job Factors Page

Labor Factor Category/Description

Raw Labor Hours = 1741.60
Total Labor Hours = 1741.60

Labor Distribution Page

Labor Category/Description	Percent	Hours	Rate	Cost	Locked
JOURNEYMAN	100.00	1741.60	$57.80	$100,664.48	N

Total Labor Hours = 1741.60 Hours
Total Labor Hours Allocated= 1741.60 Hours
Total Labor Cost = $100,664.48
Average Labor Cost = $57.80

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	Distribution Boards SDPOR1 & SDPOR2 120/208V 700A							
I	9760	8	SWG-MLO/MAIN 300V 800A	2.00	0.00	E	0.00	15.00	E	30.00
I	7822	37	TER TERMINATION-500 MCM	16.00	0.00	E	0.00	0.63	E	10.08
I	7812	37	TER TERMINATION- 2 AWG	4.00	0.00	E	0.00	0.17	E	0.68
I	7808	37	TER TERMINATION- 8 AWG	72.00	0.00	E	0.00	0.12	E	8.64
I	7807	37	TER TERMINATION- 10 AWG	24.00	0.00	E	0.00	0.10	E	2.40
		0	Qty (24) Standard 120/240V 100A Panels OR1A thru OR12A and OR1B thru OR12B							
I	9813	7	PANEL 120/240V 100A	24.00	0	E	0.00	4.00	E	96.00
I	7811	37	TER TERMINATION- 3 AWG	72.00	0	E	0.00	0.16	E	11.52
I	7807	37	TER TERMINATION- 10 AWG	1032.00	0	E	0.00	0.10	E	103.20
		0	480V Panel to 225KVA Transformer							
		0	Qty (2) Feeders							
I	1856	2	EM-3 EMT-CONDUIT	20.00	539.76	C	107.95	13.00	C	2.60
I	1876	2	EM-3 EMT-90-ELLS	4.00	5950.38	C	238.02	0.52	E	2.08
I	1934	2	EMC 3 CAST COMP COUP	6.00	30.72	E	184.32	0.00	C	0.00
I	1954	2	EMC 3 CAST COMP CONN	4.00	24.81	E	99.24	30.00	C	1.20
I	526	2	BU-3 PLASTIC BUSHING	4.00	150.15	C	6.01	24.00	C	0.96
I	3880	2	HA-3 MINERALLAC	6.00	183.55	C	11.01	16.00	C	0.96
I	8216	4	WC-THHN-STRA #500MCM	75.00	8045	M	603.38	30.00	M	2.25
I	8198	4	WC-THHN-STRA #3	30.00	939	M	28.17	12.50	M	0.38
A	805	0	MTR-200 HP 480V. FLEX	2.00	407.52	E	815.04	5.00	E	10.00
I	7811	37	TER TERMINATION- 3 AWG	2.00	0	E	0.00	0.16	E	0.32
I	7822	37	TER TERMINATION-500 MCM	6.00	0	E	0.00	0.63	E	3.78
		0	225 KVA Transformer Qty (2)							
I	9913	8	TRANS- 225KVA 3P DRY	2.00	0	E	0.00	36.00	E	72.00
I	4045	38	KO-3 LABOR ONLY	2.00	0	E	0.00	0.96	E	1.92
I	4046	38	KO-3 1/2 LABOR ONLY	4.00	0	E	0.00	1.10	E	4.40
I	4902	4	LU-SOLDERLESS-CU 0 AWG	4.00	1.78	E	7.12	0.40	E	1.60
I	4904	4	LU-SOLDERLESS-CU 250MCM	4.00	4.21	E	16.84	0.65	E	2.60
I	4906	4	LU-SOLDERLESS-CU 500MCM	24.00	10.59	E	254.16	0.83	E	19.92
		0	225KVA Transformer to Dist Board SDPOR1 & SDPOR2							
		0	Qty (2) Feeders							
I	1858	2	EM-3 1/2 EMT-CONDUIT	120.00	713.28	C	855.94	15.00	C	18.00
I	1878	2	EM-3 1/2 EMT-90-ELLS	8.00	7495.71	C	599.66	0.63	E	5.04
I	1936	2	EMC 3 1/2 CAST COMP COUP	20.00	44.95	E	899.00	0.00	C	0.00
I	1956	2	EMC 3 1/2 CAST COMP CONN	8.00	33.2	E	265.60	37.00	C	2.96
I	528	2	BU-3 1/2 PLASTIC BUSHING	8.00	203.13	C	16.25	30.00	C	2.40
I	3882	2	HA-3 1/2 MINERALLAC	24.00	217.38	C	52.17	18.00	C	4.32
I	8216	4	WC-THHN-STRA #500MCM	528.00	8045	M	4247.76	30.00	M	15.84
I	8206	4	WC-THHN-STRA #2/0	130.00	2183	M	283.79	20.00	M	2.60
I	783	0	MTR-150 HP 208V. FLEX	4.00	727.07	E	2908.27	8.25	E	32.99
I	7815	37	TER TERMINATION-2/0 AWG	4.00	0	E	0.00	0.23	E	0.92
I	7822	37	TER TERMINATION-500 MCM	16.00	0	E	0.00	0.63	E	10.08
		0	Feeders from SDPOR1 & SDPOR2 to Panels OR1A thru OR12A & OR1B thru OR12B							
		0	Typical (3) #8 & (1) #10 in 3/4" Conduit 25' each							
I	1844	1	EM-3/4 EMT-CONDUIT	600.00	70.2	C	421.20	4.50	C	27.00
I	50193	1	EMS 3/4 STEEL SS COUP	60.00	0.45	E	27.00	0.00	C	0.00
I	50203	1	EMS 3/4 STEEL SS CONN	48.00	0.39	E	18.72	7.00	C	3.36
I	3868	1	HA-3/4 MINERALLAC	78.00	43.26	C	33.74	6.00	C	4.68
I	4039	38	KO-3/4 LABOR ONLY	48.00	0	E	0.00	0.18	E	8.64
I	8192	3	WC-THHN-STRA #8	1980.00	316	M	625.68	9.00	M	17.82
	8180	3	WC-THHN-SOLID #10	660.00	197.42	M	130.30	6.50	M	4.29

Raw Material Total = $13,756.33
Raw Labor Hours = 550.43 Hours

Figure 15: Supplier Cost Summary for the Grounded Power System (Without GFCIs) Equipment and Materials

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	Distribution Boards SDPOR1 & SDPOR2 120/208V 700A							
I	9760	8	SWG-MLO/MAIN 300V 800A	2.00	0.00	E	0.00	15.00	E	30.00
I	7822	37	TER TERMINATION-500 MCM	16.00	0.00	E	0.00	0.63	E	10.08
I	7812	37	TER TERMINATION- 2 AWG	4.00	0.00	E	0.00	0.17	E	0.68
I	7808	37	TER TERMINATION- 8 AWG	72.00	0.00	E	0.00	0.12	E	8.64
I	7807	37	TER TERMINATION- 10 AWG	24.00	0.00	E	0.00	0.10	E	2.40
		0	Qty (24) Standard 120/240V 100A Panels OR1A thru OR12A and OR1B thru OR12B							
I	9813	7	PANEL 120/240V 100A	24.00	0	E	0.00	4.00	E	96.00
I	7811	37	TER TERMINATION- 3 AWG	72.00	0	E	0.00	0.16	E	11.52
I	7807	37	TER TERMINATION- 10 AWG	1032.00	0	E	0.00	0.10	E	103.20
		0	480V Panel to 225KVA Transformer							
		0	Qty (2) Feeders							
I	1856	2	EM-3 EMT-CONDUIT	20.00	539.76	C	107.95	13.00	C	2.60
I	1876	2	EM-3 EMT-90-ELLS	4.00	5950.38	C	238.02	0.52	E	2.08
I	1934	2	EMC 3 CAST COMP COUP	6.00	30.72	E	184.32	0.00	C	0.00
I	1954	2	EMC 3 CAST COMP CONN	4.00	24.81	E	99.24	30.00	C	1.20
I	526	2	BU-3 PLASTIC BUSHING	4.00	150.15	C	6.01	24.00	C	0.96
I	3880	2	HA-3 MINERALLAC	6.00	183.55	C	11.01	16.00	C	0.96
I	8216	4	WC-THHN-STRA #500MCM	75.00	8045	M	603.38	30.00	M	2.25
I	8198	4	WC-THHN-STRA #3	30.00	939	M	28.17	12.50	M	0.38
A	805	0	MTR-200 HP 480V. FLEX	2.00	407.52	E	815.04	5.00	E	10.00
I	7811	37	TER TERMINATION- 3 AWG	2.00	0	E	0.00	0.16	E	0.32
I	7822	37	TER TERMINATION-500 MCM	6.00	0	E	0.00	0.63	E	3.78
		0	225 KVA Transformer Qty (2)							
I	9913	8	TRANS- 225KVA 3P DRY	2.00	0	E	0.00	36.00	E	72.00
I	4045	38	KO-3 LABOR ONLY	2.00	0	E	0.00	0.96	E	1.92
I	4046	38	KO-3 1/2 LABOR ONLY	4.00	0	E	0.00	1.10	E	4.40
I	4902	4	LU-SOLDERLESS-CU 0 AWG	4.00	1.78	E	7.12	0.40	E	1.60
I	4904	4	LU-SOLDERLESS-CU 250MCM	4.00	4.21	E	16.84	0.65	E	2.60
I	4906	4	LU-SOLDERLESS-CU 500MCM	24.00	10.59	E	254.16	0.83	E	19.92
		0	225KVA Transformer to Dist Board SDPOR1 & SDPOR2							
		0	Qty (2) Feeders							
I	1858	2	EM-3 1/2 EMT-CONDUIT	120.00	713.28	C	855.94	15.00	C	18.00
I	1878	2	EM-3 1/2 EMT-90-ELLS	8.00	7495.71	C	599.66	0.63	E	5.04
I	1936	2	EMC 3 1/2 CAST COMP COUP	20.00	44.95	E	899.00	0.00	C	0.00
I	1956	2	EMC 3 1/2 CAST COMP CONN	8.00	33.2	E	265.60	37.00	C	2.96
I	528	2	BU-3 1/2 PLASTIC BUSHING	8.00	203.13	C	16.25	30.00	C	2.40
I	3882	2	HA-3 1/2 MINERALLAC	24.00	217.38	C	52.17	18.00	C	4.32
I	8216	4	WC-THHN-STRA #500MCM	528.00	8045	M	4247.76	30.00	M	15.84
I	8206	4	WC-THHN-STRA #2/0	130.00	2183	M	283.79	20.00	M	2.60
I	783	0	MTR-150 HP 208V. FLEX	4.00	727.07	E	2908.27	8.25	E	32.99
I	7815	37	TER TERMINATION-2/0 AWG	4.00	0	E	0.00	0.23	E	0.92
I	7822	37	TER TERMINATION-500 MCM	16.00	0	E	0.00	0.63	E	10.08
		0	Feeders from SDPOR1 & SDPOR2 to Panels OR1A thru OR12A & OR1B thru OR12B							
		0	Typical (3) #8 & (1) #10 in 3/4" Conduit 25' each							
I	1844	1	EM-3/4 EMT-CONDUIT	600.00	70.2	C	421.20	4.50	C	27.00
I	50193	1	EMS 3/4 STEEL SS COUP	60.00	0.45	E	27.00	0.00	C	0.00
I	50203	1	EMS 3/4 STEEL SS CONN	48.00	0.39	E	18.72	7.00	C	3.36
I	3868	1	HA-3/4 MINERALLAC	78.00	43.26	C	33.74	6.00	C	4.68
I	4039	38	KO-3/4 LABOR ONLY	48.00	0	E	0.00	0.18	E	8.64
I	8192	3	WC-THHN-STRA #8	1980.00	316	M	625.68	9.00	M	17.82
	8180	3	WC-THHN-SOLID #10	660.00	197.42	M	130.30	6.50	M	4.29

Raw Material Total = $13,756.33
Raw Labor Hours = 550.43 Hours

Figure 16: Supplier Cost for the Grounded Power System (Without GFCIs) Equipment, Materials and Labor (Upstream Breakers, Feeders, and Isolated Power Panels)

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-1							
		0	Panel OR-1A							
A	146	0	DE2-DUP G/S HOS 1G FUR	6.00	19.40	E	116.37	0.86	E	5.13
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	60.00	1.34	E	80.56	0.07	E	4.36
		0	Panel OR-1B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	80.00	1.89	E	151.12	0.09	E	7.08
A	246	0	EM-1/2 EMT 3/10 SOL	165.00	1.13	E	185.70	0.07	E	10.80
		0	OR-2							
		0	Panel OR-2A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	170.00	1.13	E	191.33	0.07	E	11.13
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-2B							
A	146	0	DE2-DUP G/S HOS 1G FUR	7.00	19.40	E	135.77	0.86	E	5.99
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	OR-3							
		0	Panel OR-3A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	6.00	27.25	E	163.50	1.02	E	6.12
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	105.00	1.89	E	198.35	0.09	E	9.30
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	55.00	1.34	E	73.84	0.07	E	3.99
		0	Panel OR-3B							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	10.00	1.89	E	18.89	0.09	E	0.89
A	246	0	EM-1/2 EMT 3/10 SOL	225.00	1.13	E	253.23	0.07	E	14.73

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-4							
		0	Panel OR-4A							
A	146	0	DE2-DUP G/S HOS 1G FUR	10.00	19.40	E	193.95	0.86	E	8.55
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	125.00	1.89	E	236.13	0.09	E	11.07
A	246	0	EM-1/2 EMT 3/10 SOL	400.00	1.13	E	450.19	0.07	E	26.18
		0	Panel IPL1							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-4B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	5.00	27.25	E	136.25	1.02	E	5.10
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	70.00	1.89	E	132.23	0.09	E	6.20
A	246	0	EM-1/2 EMT 3/10 SOL	200.00	1.13	E	225.09	0.07	E	13.09
		0	OR-5							
		0	Panel OR-5A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	6.00	27.25	E	163.50	1.02	E	6.12
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	105.00	1.89	E	198.35	0.09	E	9.30
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	55.00	1.34	E	73.84	0.07	E	3.99
		0	Panel OR-5B							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	10.00	1.89	E	18.89	0.09	E	0.89
A	246	0	EM-1/2 EMT 3/10 SOL	225.00	1.13	E	253.23	0.07	E	14.73
		0	OR-6							
		0	Panel OR-6A							
A	146	0	DE2-DUP G/S HOS 1G FUR	10.00	19.40	E	193.95	0.86	E	8.55
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	125.00	1.89	E	236.13	0.09	E	11.07
A	246	0	EM-1/2 EMT 3/10 SOL	400.00	1.13	E	450.19	0.07	E	26.18
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-6B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	5.00	27.25	E	136.25	1.02	E	5.10
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	70.00	1.89	E	132.23	0.09	E	6.20
A	246	0	EM-1/2 EMT 3/10 SOL	200.00	1.13	E	225.09	0.07	E	13.09

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-7							
		0	Panel OR-7A							
A	146	0	DE2-DUP G/S HOS 1G FUR	6.00	19.40	E	116.37	0.86	E	5.13
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	60.00	1.34	E	80.56	0.07	E	4.36
		0	Panel OR-7B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	80.00	1.89	E	151.12	0.09	E	7.08
A	246	0	EM-1/2 EMT 3/10 SOL	165.00	1.13	E	185.70	0.07	E	10.80
		0	OR-8							
		0	Panel OR-8A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	170.00	1.13	E	191.33	0.07	E	11.13
		0	Panel IPL2							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-8B							
A	146	0	DE2-DUP G/S HOS 1G FUR	7.00	19.40	E	135.77	0.86	E	5.99
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	OR-9							
		0	Panel OR-9A							
A	146	0	DE2-DUP G/S HOS 1G FUR	6.00	19.40	E	116.37	0.86	E	5.13
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	60.00	1.34	E	80.56	0.07	E	4.36
		0	Panel OR-9B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	15.00	10.33	E	154.88	0.49	E	7.35
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	80.00	1.89	E	151.12	0.09	E	7.08
A	246	0	EM-1/2 EMT 3/10 SOL	165.00	1.13	E	185.70	0.07	E	10.80

DB	#	Ph.	Description	Quantity	Mat. Cost	U	Tot. Mat.	Lab. Hrs.	U	Tot. Hrs.
		0	OR-10							
		0	Panel OR-10A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	170.00	1.13	E	191.33	0.07	E	11.13
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-10B							
A	146	0	DE2-DUP G/S HOS 1G FUR	7.00	19.40	E	135.77	0.86	E	5.99
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	115.00	2.32	E	267.19	0.10	E	11.83
A	275	0	EM-3/4 EMT 5/10 SOL	40.00	1.89	E	75.56	0.09	E	3.54
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	OR-11							
		0	Panel OR-11A							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	6.00	27.25	E	163.50	1.02	E	6.12
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	125.00	2.32	E	290.42	0.10	E	12.86
A	275	0	EM-3/4 EMT 5/10 SOL	105.00	1.89	E	198.35	0.09	E	9.30
A	246	0	EM-1/2 EMT 3/10 SOL	135.00	1.13	E	151.94	0.07	E	8.84
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	55.00	1.34	E	73.84	0.07	E	3.99
		0	Panel OR-11B							
A	146	0	DE2-DUP G/S HOS 1G FUR	9.00	19.40	E	174.56	0.86	E	7.70
A	146	0	DE2-DUPLEX I/S 2G FUR	4.00	27.25	E	109.00	1.02	E	4.08
A	4148	0	OT-BOX ASSEMBLY	17.00	10.33	E	175.53	0.49	E	8.33
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	10.00	1.89	E	18.89	0.09	E	0.89
A	246	0	EM-1/2 EMT 3/10 SOL	225.00	1.13	E	253.23	0.07	E	14.73
		0	OR-12							
		0	Panel OR-12A							
A	146	0	DE2-DUP G/S HOS 1G FUR	10.00	19.40	E	193.95	0.86	E	8.55
A	146	0	DE2-DUPLEX I/S 2G FUR	3.00	27.25	E	81.75	1.02	E	3.06
A	4148	0	OT-BOX ASSEMBLY	8.00	10.33	E	82.60	0.49	E	3.92
A	277	0	EM-3/4 EMT 7/10 SOL	135.00	2.32	E	313.66	0.10	E	13.88
A	275	0	EM-3/4 EMT 5/10 SOL	125.00	1.89	E	236.13	0.09	E	11.07
A	246	0	EM-1/2 EMT 3/10 SOL	400.00	1.13	E	450.19	0.07	E	26.18
		0	Panel IPL3							
A	247	0	EM-1/2 EMT 4/10 SOL	50.00	1.34	E	67.13	0.07	E	3.63
		0	Panel OR-12B							
A	146	0	DE2-DUP G/S HOS 1G FUR	8.00	19.40	E	155.16	0.86	E	6.84
A	146	0	DE2-DUPLEX I/S 2G FUR	5.00	27.25	E	136.25	1.02	E	5.10
A	4148	0	OT-BOX ASSEMBLY	7.00	10.33	E	72.28	0.49	E	3.43
A	277	0	EM-3/4 EMT 7/10 SOL	100.00	2.32	E	232.34	0.10	E	10.29
A	275	0	EM-3/4 EMT 5/10 SOL	70.00	1.89	E	132.23	0.09	E	6.20
A	246	0	EM-1/2 EMT 3/10 SOL	200.00	1.13	E	225.09	0.07	E	13.09

Raw Material Total = $25,111.67
Raw Labor Hours = 1191.17 Hours

Figure 17: Supplier Cost for the Grounded Power System (Without GFCIs) Materials and Labor (Branch Circuit Wiring, and Receptacles)