

SIGNATURE DATE:  
PLANS ARE NOT FOR CONSTRUCTION  
UNLESS APPROVED AND STAMPED  
BY BUILDING DEPARTMENT.

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REGISTERED PROFESSIONAL ENGINEER  
ELECTRICAL  
No. 4725  
Exp. 6/30/21  
STATE OF CALIFORNIA

REVISIONS:  
06-21-12  
ADD#1 09/28/12

Project Title:  
**MARENGO BLDG  
CENTRAL KITCHEN**

700 S MARENGO  
ALHAMBRA, CA 91803

Sheet Title:  
**SINGLE LINE  
DIAGRAM**

Project No: 01113  
Scale: NONE  
Date: 11-01-2011  
Sheet No:  
**E-02**  
of Sheets

FEEDER SCHEDULE (COPPER)											
3-WIRE FEEDERS						4-WIRE FEEDERS					
FEEDER SYMBOL	NUMBER OF RUNS	CONDUIT SIZE	CONDUCTOR SIZE	GROUND WIRE	FEEDER SYMBOL	NUMBER OF RUNS	CONDUIT SIZE	CONDUCTOR SIZE	GROUND WIRE		
20A	1	3/4	3#12	#12	20Y	1	3/4	4#12	#12		
30A	1	3/4	3#10	#10	30Y	1	3/4	4#10	#10		
40A	1	1	3#8	#10	40Y	1	1	4#8	#10		
50A	1	1	3#6	#10	50Y	1	1	4#6	#10		
60A	1	1	3#6	#8	60Y	1	1	4#6	#8		
70A	1	1	3#4	#8	70Y	1	1-1/4	4#4	#8		
80A	1	1	3#3	#8	80Y	1	1-1/4	4#3	#8		
90A	1	1	3#3	#8	90Y	1	1-1/4	4#3	#8		
100A	1	1-1/4	3#2	#8	100Y	1	1-1/4	4#2	#8		
125A	1	1-1/4	3#1	#6	125Y	1	1-1/2	4#1	#6		
150A	1	1-1/2	3#1/0	#6	150Y	1	1-1/2	4#1/0	#6		
175A	1	1-1/2	3#2/0	#6	175Y	1	2	4#2/0	#6		
200A	1	2	3#3/0	#6	200Y	1	2	4#3/0	#6		
225A	1	2	3#4/0	#4	225Y	1	2-1/2	4#4/0	#4		
250A	1	2	3#250KCM	#4	250Y	1	2-1/2	4#250KCM	#4		
300A	1	2-1/2	3#350KCM	#4	300Y	1	3	4#350KCM	#4		
350A	1	4	3#500KCM	#3	350Y	1	4	4#500KCM	#3		
400A	1	4	3#600KCM	#3	400Y	1	4	4#600KCM	#3		
500A	2	2	3#250KCM	#2	500Y	2	2-1/2	4#250KCM	#2		
600A	2	2-1/2	3#350KCM	#1	600Y	2	3	4#350KCM	#1		
700A	3	2-1/2	3#250KCM	#1/0	700Y	3	2-1/2	4#250KCM	#1/0		
800A	2	4	3#600KCM	#1/0	800Y	2	4	4#600KCM	#1/0		
1000A	3	3	3#400KCM	#2/0	1000Y	3	3	4#400KCM	#2/0		
1200A	3	3	3#600KCM	#3/0	1200Y	3	4	4#600KCM	#3/0		
1600A	4	4	3#600KCM	#4/0	1600Y	4	4	4#600KCM	#4/0		
2000A	6	4	3#600KCM	#250KCM	2000Y	5	4	4#600KCM	#250KCM		
2500A	6	4	3#600KCM	#350KCM	2500Y	6	4	4#600KCM	#350KCM		
3000A	8	4	3#500KCM	#400KCM	3000Y	8	4	4#500KCM	#400KCM		
4000A	10	4	3#600KCM	#500KCM	4000Y	10	4	4#600KCM	#500KCM		

**GENERAL NOTES :**

- UNLESS OTHERWISE NOTED, ALL DEVICES SHOWN ARE 3 POLE.
- EQUIPMENT LOCATED ON ROOF SHALL BE WP TYPE
- THE SERIES RATED OVERCURRENT PROTECTION DEVICES SHALL BE IDENTIFIED AND LABELED IN ACCORDANCE WITH CEC 110-22.
- ALL INDOOR TRANSFORMERS TO BE 115°K RISE, ENERGY EFFICIENT. ALL BUS AND WINDINGS SHALL COPPER.
- ALL SERVICE DISCONNECT DEVICES SHALL BE LABELED AS A "SERVICE DISCONNECTING MEANS".
- ALL ELECTRICAL EQUIPMENT SHALL HAVE COPPER BUS.
- EQUIPMENT WITH SERIES RATING APPLIED WILL BE FIELD MARKED "CAUTION SERIES RATED SYSTEM 18KAIC AVAILABLE. IDENTIFIED REPLACEMENT COMPONENT REQUIRED PER CEC 110-22.
- ALL ELECTRICAL PANELS, BRANCH CIRCUIT BREAKERS AND TRANSFORMERS WILL BE MANUFACTURED BY CUTLER HAMMER.

**KEY NOTES:**

- PROVIDE 3/4" W/ #2 COPPER BARE WIRE CONNECTED TO EXISTING BUILDING MASTER GROUND BAR LOCATED ADJACENT TO EXISTING "BDS1"
- FEEDER SHALL BE INSTALLED WITHIN 10 FEET.
- NEW PANEL AND BREAKERS SHALL MATCH EXISTING TYPE AND AIC RATING.
- PROVIDE AND INSTALL A NEW CIRCUIT BREAKER.
- ENCLOSED CIRCUIT BREAKER. SEE LOCATION ON POWER PLAN.
- PROVIDE #2/0 COPPER BARE WIRE CONNECTED TO EXISTING BUILDING MASTER GROUND BAR LOCATED ADJACENT TO EXISTING "BDS1"
- NEW ELECTRICAL PANEL WITH CIRCUIT BREAKERS THAT ARE FULLY RATED FOR 35KAIC WITH UPSTREAM CIRCUIT BREAKER.
- NEW ELECTRICAL PANEL WITH CIRCUIT BREAKERS THAT ARE FULLY RATED FOR 14KAIC WITH UPSTREAM CIRCUIT BREAKER.
- NEW ELECTRICAL PANEL WITH CIRCUIT BREAKERS THAT ARE FULLY RATED FOR 10KAIC WITH UPSTREAM CIRCUIT BREAKER.
- NEW CIRCUIT BREAKER THAT IS FULLY RATED FOR 22KAIC.

**LEGEND:**

- INDICATES EXISTING TO REMAIN.
- INDICATES NEW.

**480V, 3φ Voltage Drop Calculation**  
 $V_d = (I \times R \times 1.732)$   
 Voltage x 100  
 $R = (L / 1000) \times \text{Effective Z} @ .85 \text{ PF from Table 9, Chapter 9, CEC}$

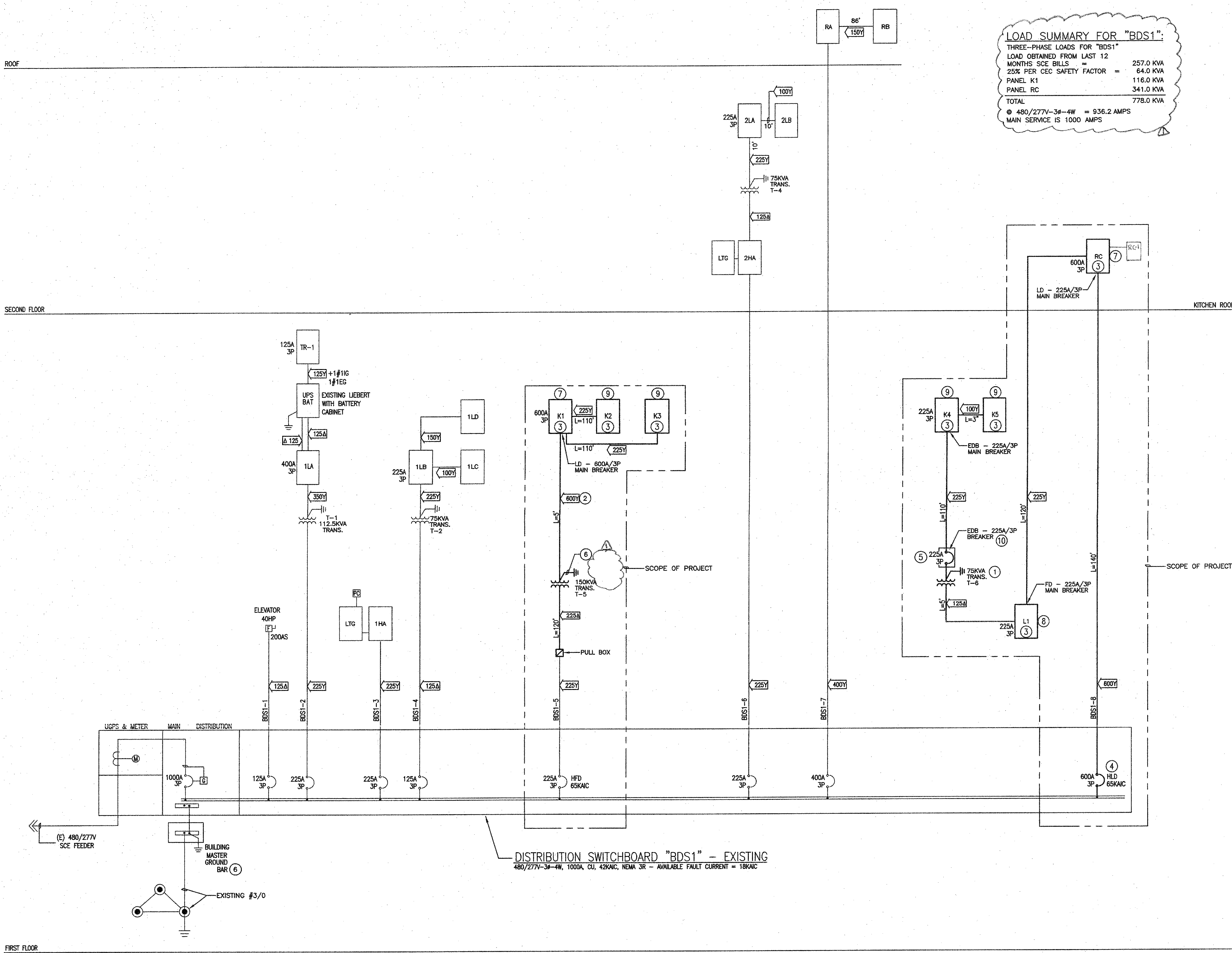
**208V, 3φ Voltage Drop Calculation**  
 $V_d = (I \times R \times 1.732)$   
 Voltage x 100  
 $R = (L / 1000) \times \text{Effective Z} @ .85 \text{ PF from Table 9, Chapter 9, CEC}$

**Short Circuit Calculation**  
 $I'' = I \text{ factor}$   
 $m = \text{multiplier}$

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PLANNING DIVISION  
DATE: 11/01/2011  
BUILDING DIVISION  
DATE: 11/01/2011  
SEPARATE PERMITS ARE REQUIRED FOR ALL WORK IN THE PUBLIC RIGHT-OF-WAY

**LOAD SUMMARY FOR "BDS1":**  
 THREE-PHASE LOADS FOR "BDS1"  
 LOAD OBTAINED FROM LAST 12 MONTHS SCE BILLS = 257.0 KVA  
 25% PER CEC SAFETY FACTOR = 64.0 KVA  
 PANEL K1 116.0 KVA  
 PANEL RC 341.0 KVA  
 TOTAL 778.0 KVA  
 @ 480/277V-3φ-4W = 936.2 AMPS  
 MAIN SERVICE IS 1000 AMPS



**SINGLE LINE DIAGRAM**  
N.T.S.

**208V, 3Phase Short Circuit Calculation**  
 Total Fault Current at Panel K1: 18,000A

Load Name	COND	Per Phase	S or NM	AL or CU	C-FACT	L (ft)	Source	Isc (A)	f	M	Fault Current	Equipment Rating	Equipment Evaluation
PANEL K1	#4/0	1	S	CU	22965	18.147	0.03	0.97	18,000	0.48	18,000	PASS	PASS
PANELS K2 OR K3	#4/0	2	S	CU	15062	210	18.147	1.10	0.48	0	10,000	PASS	PASS

**Motor Load Contribution**

PANEL	KVA	FLA
PANEL K1	4	11.1111
PANEL K2	4	13.3333
Total Motor Contribution	8	24.4444
Inrush @ 6X FLA	6X	146.6667

**208V, 3Phase Short Circuit Calculation**  
 Total Fault Current at Panel K4: 18,000A

Load Name	COND	Per Phase	S or NM	AL or CU	C-FACT	L (ft)	Source	Isc (A)	f	M	Fault Current	Equipment Rating	Equipment Evaluation
PANEL K4	#4/0	1	S	CU	16002	18.170	1.10	0.48	18,000	0.28	18,000	PASS	PASS
PANEL K5	#2	2	S	CU	5906	18.170	2.82	0.28	18,000	0.28	18,000	PASS	PASS

**Motor Load Contribution**

PANEL	KVA	FLA
PANEL K4	10.2	28.3333
PANEL K5	0	0.0000
Total Motor Contribution	10.2	28.3333
Inrush @ 6X FLA	6X	170.0000

**480V, 3Phase Short Circuit Calculation**  
 Total Fault Current at Panel RC: 16,000A

Load Name	COND	Per Phase	S or NM	AL or CU	C-FACT	L (ft)	Source	Isc (A)	f	M	Fault Current	Equipment Rating	Equipment Evaluation
PANEL RC	#6/0	1	S	CU	22965	18.170	0.43	0.70	16,000	0.48	16,000	PASS	PASS
PANEL L1	#6/0	1	S	CU	15062	210	18.170	1.23	0.45	0	16,000	PASS	PASS

**Motor Load Contribution**

PANEL	KVA	FLA
PANEL RC	218.7	263.1789
PANEL L1	17.3	21.0590
Total Motor Contribution	236.0	284.2379
Inrush @ 6X FLA	6X	1705.4152

**Voltage Drop Calculation**

Upstream Segment	Downstream Segment	Conductor Size	Phase Voltage	Phase (1 or 3)	Sets of Cond. (CU or AL)	Distance (1-way)	FLA	R <sup>2</sup> (Ohm/1000)	Vd	Vd%
MGA	XMRTS	#4/0	480	3	CU	120	1880	0.0608	2.274601	0.48
WMR TS	PANEL K1	#6/0	208	3	CU	5	760	0.0214	0.033356	0.02
PANEL K1	PANEL K2 OR K3	#4/0	208	3	CU	116	1880	0.0608	2.085051	1.01
MGA	PANEL RC	#6/0	480	3	CU	140	1880	0.0214	2.460755	0.52
PANEL RC	PANEL L1	#6/0	480	3	CU	120	1880	0.0608	2.274601	0.48
PANEL L1	WMR TS	#4/0	480	3	CU	5	760	0.154	0.133564	0.63
WMR TS	PANEL RC OR K1	#6/0	208	3	CU	110	1880	0.0608	2.055051	1.01