Panel ID: A | Voltage: 208 / 120 | Panel Type: NQOD
Location: B.O.H./HALL | Phase: 3 | Type Encl.: NEMA-1
Mounting: SURFACE | Wire: 4
Main Type: 200A MCB | Main Size: 225 Amps

All phases to be balanced to within 10% using actual connected loads.

CKT NO.	BRANCH CIRCUIT DESCRIPTION	CKT BKR SIZE	CKT BKR OPTION	N.E.C. LOAD (KVA)	ACTUAL LOAD (KVA)	PHASE	ACTUAL LOAD (KVA)	N.E.C. LOAD (KVA)	CKT BKR OPTION	CKT BKR SIZE	BRANCH CIRCUIT DESCRIPTION	CKT NO.
1	RTU-1	30/3	HR	2.352	2.352	A	4.308	4.308	HR	50/3	RTU-2	2
3	-- --	--	--	2.352	2.352	B	4.308	4.308	--	--	-- --	4
5	-- --	--	--	2.352	2.352	C	4.308	4.308	--	--	-- --	6
7	P.O.S. REC	20/1		0.900	0.900	A	0.400	0.400	LC-1	20/1	SHOW WINDOW LED MONITOR	8
9	BACKWRAP REC	20/1		0.180	0.180	B	0.000	0.000		20/1	SPARE	10
11	SPARE	20/1		0.000	0.000	C	0.000	0.000		20/1	SPARE	12
13	BACKWRAP REC	20/1		0.180	0.180	A	0.360	0.360		20/1	WRITING DESK REC	14
15	BACKWRAP TV REC	20/1		0.400	0.400	B	0.540	0.540		20/1	WRITING DESK REC	16
17	TC-1/LC-1	20/1	LO	0.200	0.200	C	0.044	0.044	LC-1	20/1	SHOW WINDOW LIGHTS	18
19	SALES WALL LIGHTS	20/1		0.561	0.561	A	1.200	1.200	LC-1	20/1	EXTERIOR SIGN	20
21	SALES LIGHTS (EM/EX)	20/1	LO	1.152	1.152	B	2.844	2.844	HR	35/3	RTU-3	22
23	LABORATORY LTS (EM/EX)	20/1	LO	0.320	0.320	C	2.844	2.844		--	-- --	24
25	SHOW WINDOW REC	20/1	LC-1	0.540	0.540	A	2.844	2.844		--	-- --	26
27	SALES GENERAL RECS	20/1		0.360	0.360	B	0.000	0.000		20/1	SPARE	28
29	INTERIOR SIGN	20/1		0.400	0.400	C	0.000	0.000			SPACE	30
31	DISPLAY CASE REC	20/1		0.900	0.900	A	0.000	0.000			SPACE	32
33	DISPLAY CASE REC	20/1		1.260	1.260	B	0.000	0.000			SPACE	34
35	RTU REC	20/1		0.360	0.360	C	0.000	0.000			SPACE	36
37	PANEL 'C'	100/3		8.760	8.760	A	5.396	5.396		100/3	PANEL 'B'	38
39	-- --	--		5.580	5.580	B	4.860	4.860		--	-- --	40
41	-- --	--		6.800	6.800	C	4.800	4.800		--	-- --	42

Actual Load Panel Summary: Phase A: 28.7 KVA; Phase B: 23.8 KVA; Phase C: 22.4 KVA; Total: 75.0 KVA
N.E.C. Load Panel Summary: Phase A: 28.7 KVA 239.2 AMPS; Phase B: 23.8 KVA 198.6 AMPS; Phase C: 22.4 KVA 186.9 AMPS; Total: 75.0 KVA 208.1 AMPS
Breaker Options (If Used): LC# - Wire Thru Lighting Contactor #; LO - Lock-On Device; IG- Isolated Ground Conductor; LC# - Wire Thru Lighting Contactor#; HR - HACR Rated Circuit Breaker

Panel ID: C | Voltage: 208 / 120 | Panel Type: NQOD
Location: LAB | Phase: 3 | Type Encl.: NEMA-1
Mounting: SURFACE | Wire: 4
Main Type: MLO | Bus Amperage: 100 Amps

All phases to be balanced to within 10% using actual connected loads.

CKT NO.	BRANCH CIRCUIT DESCRIPTION	CKT BKR SIZE	CKT BKR OPTION	N.E.C. LOAD (KVA)	ACTUAL LOAD (KVA)	PHASE	ACTUAL LOAD (KVA)	N.E.C. LOAD (KVA)	CKT BKR OPTION	CKT BKR SIZE	BRANCH CIRCUIT DESCRIPTION	CKT NO.
1	SPARE	20/1		0.000	0.000	A	1.000	1.000		20/1	LENS CENTER LOCATE #L04	2
3	VERTOMETER #L30	20/1		0.200	0.200	B	0.180	0.180		20/1	COMPUTER #L01	4
5	BEAN PAN #L34 & FRAME BFR #L54	20/1		1.240	1.240	C	0.180	0.180		20/1	EMPLOYEE TIME CLOCK #L02	6
7	STKG KIT #L52 & FLEX DRILL #L51	20/1		1.300	1.300	A	1.000	1.000		20/1	LENS MAKER #L09 (CS-7)	8
9	DBI DYE TANK #L41	20/1		1.800	1.800	B	1.000	1.000		20/1	LAP SERVICE SAVER #L05	10
11	CERAMIC HAND EDGER #L37	20/1		0.780	0.780	C	0.720	0.720		20/1	BLOCKER #L07 (SURFACE)	12
13	440 WECO EDGER #L35	20/1		1.200	1.200	A	1.560	1.560		20/1	LENS REC #L16	14
15	CS-7 BLKR #L31 & VERTMTR #L30	20/1		0.440	0.440	B	1.600	1.600		20/1	CYLINDER MACHINE #L18	16
17	LENS COATING #L38	20/1		0.720	0.720	C	1.600	1.600		20/1	CYLINDER MACHINE #L18	18
19	BACKSIDE COATER #L40	20/1		0.960	0.960	A	0.180	0.180		20/1	CHILLER #L23 (OM-003-8)	20
21	SPACE	20/1		0.000	0.000	B	0.180	0.180		20/1	RECLAIM TANK #L20	22
23	SPACE	20/1		0.000	0.000	C	1.560	1.560		20/2	AIR COMPRESSOR	24
25	SPACE	20/1		0.000	0.000	A	1.560	1.560		--	-- --	26
27	SPACE	20/1		0.000	0.000	B	0.180	0.180		20/1	GENREAL LAB REC	28
29	SPACE	20/1		0.000	0.000	C	0.000	0.000		20/1	SPARE	30
31	SPACE	20/1		0.000	0.000	A	0.000	0.000		20/1	SPARE	32
33	SPACE	20/1		0.000	0.000	B	0.000	0.000		20/1	SPARE	34
35	SPACE	20/1		0.000	0.000	C	0.000	0.000		20/1	SPARE	36
37	SPACE	20/1		0.000	0.000	A	0.000	0.000			SPACE	38
39	SPACE	20/1		0.000	0.000	B	0.000	0.000			SPACE	40
41	SPACE	20/1		0.000	0.000	C	0.000	0.000			SPACE	42

Actual Load Panel Summary: Phase A: 8.8 KVA; Phase B: 5.6 KVA; Phase C: 6.8 KVA; Total: 21.1 KVA
N.E.C. Load Panel Summary: Phase A: 8.8 KVA 73.0 AMPS; Phase B: 5.6 KVA 46.5 AMPS; Phase C: 6.8 KVA 56.7 AMPS; Total: 21.1 KVA 58.7 AMPS
Breaker Options (If Used): TC - Wire Thru TimeClock; LO - Lock-On Device; IG- Isolated Ground Conductor; Connnected to Building Steel; HR - HACR Rated Circuit Breaker

Panel ID: B | Voltage: 208 / 120 | Panel Type: NQOD
Location: B.O.H./HALL | Phase: 3 | Type Encl.: NEMA-1
Mounting: SURFACE | Wire: 4
Main Type: MLO | Main Size: 100 Amps

All phases to be balanced to within 10% using actual connected loads.

CKT NO.	BRANCH CIRCUIT DESCRIPTION	CKT BKR SIZE	CKT BKR OPTION	N.E.C. LOAD (KVA)	ACTUAL LOAD (KVA)	PHASE	ACTUAL LOAD (KVA)	N.E.C. LOAD (KVA)	CKT BKR OPTION	CKT BKR SIZE	BRANCH CIRCUIT DESCRIPTION	CKT NO.
1	WAITING ROOM REC	20/1		0.540	0.540	A	0.700	0.700		20/1	REFRIGERATOR REC	2
3	SPARE	20/1		0.000	0.000	B	1.200	1.200		20/1	MICROWAVE REC	4
5	HALL #105 REC	20/1		0.360	0.360	C	0.100	0.100		20/1	SECURITY ALARM	6
7	BOH/HALL #110, 110b, 111 REC	20/1		0.540	0.540	A	0.400	0.400		20/1	RECEPTION TV REC	8
9	RR/OFFICE/HALL LTS&FANS	20/1		0.560	0.560	B	0.720	0.720		20/1	RECEPTION REC	10
11	STORG/HALL/RECPTN/WTG LTS	20/1	LO	0.320	0.320	C	0.540	0.540		20/1	PRETEST ROOM REC	12
13	RESTROOM REC	20/1		0.720	0.720	A	0.720	0.720		20/1	CONTACT ROOM REC	14
15	OFFICE 119 REC	20/1		0.720	0.720	B	1.260	1.260		20/1	EXAM RM #1 REC	16
17	TELEPHONE BD REC	20/1	LO	0.720	0.720	C	1.260	1.260		20/1	EXAM RM #2 REC	18
19	EXAM LTS & FANS	20/1	LO	0.276	0.276	A	0.000	0.000		20/1	SPARE	20
21	SPARE	20/1		0.000	0.000	B	0.000	0.000		20/1	SPARE	22
23	WATER HEATER	20/2		1.500	1.500	C	0.000	0.000		20/1	SPARE	24
25	-- --	--		1.500	1.500	A	0.000	0.000			SPACE	26
27	EWC REC	20/1		0.400	0.400	B	0.000	0.000			SPACE	28
29	SPACE			0.000	0.000	C	0.000	0.000			SPACE	30
31	SPACE			0.000	0.000	A	0.000	0.000			SPACE	32
33	SPACE			0.000	0.000	B	0.000	0.000			SPACE	34
35	SPACE			0.000	0.000	C	0.000	0.000			SPACE	36
37	SPACE			0.000	0.000	A	0.000	0.000			SPACE	38
39	SPACE			0.000	0.000	B	0.000	0.000			SPACE	40
41	SPACE			0.000	0.000	C	0.000	0.000			SPACE	42

Actual Load Panel Summary: Phase A: 5.4 KVA; Phase B: 4.9 KVA; Phase C: 4.8 KVA; Total: 15.1 KVA
N.E.C. Load Panel Summary: Phase A: 5.4 KVA 45.0 AMPS; Phase B: 4.9 KVA 40.5 AMPS; Phase C: 4.8 KVA 40.0 AMPS; Total: 15.1 KVA 41.8 AMPS
Breaker Options (If Used): LC# - Wire Thru Lighting Contactor #; LO - Lock-On Device; IG- Isolated Ground Conductor; Connnected to Building Steel; HR - HACR Rated Circuit Breaker

ELECTRICAL LOAD SUMMARY

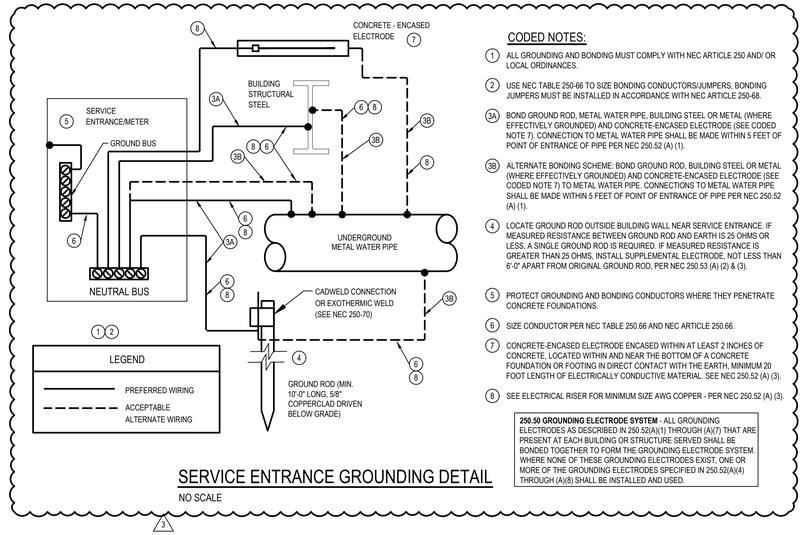
DESCRIPTION	CONNECTED KW	POWER FACTOR	CONNECTED DEMAND KVA	N.E.C. CONNECTED KVA	N.E.C. DEMAND FACTOR	N.E.C. FEEDER DEMAND KVA
LIGHTING	4.435	1.0	4.435	4.435	1.25	5.544
0 LF OF TRACK LIGHTING	0.000	1.0	0.000	0.000	1.25	0.000
RECEPTACLES	30.440	1.0	30.440	30.440	1.0 < 10 KW 0.5 RMNDR	20.220
MOTORS	7.880	0.9	8.756	8.756	125% OF LARGEST MOTOR	8.756
FIXED ELEC. SPACE HEATING *	0.000	1.0	0.000	0.000	1.0	0.000
AIR CONDITIONING SYSTEM *	28.512	1.0	28.512	28.512	125% OF LARGEST MOTOR	29.587
ELECTRIC WATER HEATER	3.000	1.0	3.000	3.000	1.25	3.750
MISCELLANEOUS	0.698	1.0	0.698	0.698	1.0	0.698
TOTALS:	74.965		75.841	75.841		68.554

NOTES:
* USE GREATER OF THE LF - LINEAR FEET

N.E.C. DEMAND KVA x 1000 / SYSTEM VOLTAGE x 1.73 = MIN FEEDER AMPS

ELECTRICAL SERVICE VOLTAGE = 208 V - 3 PHASE | 68.554 KVA x 1000 / 208 x 1.73 = 190.4 AMPS

MINIMUM ELECTRICAL SERVICE AMPERAGE = 200 AMPS

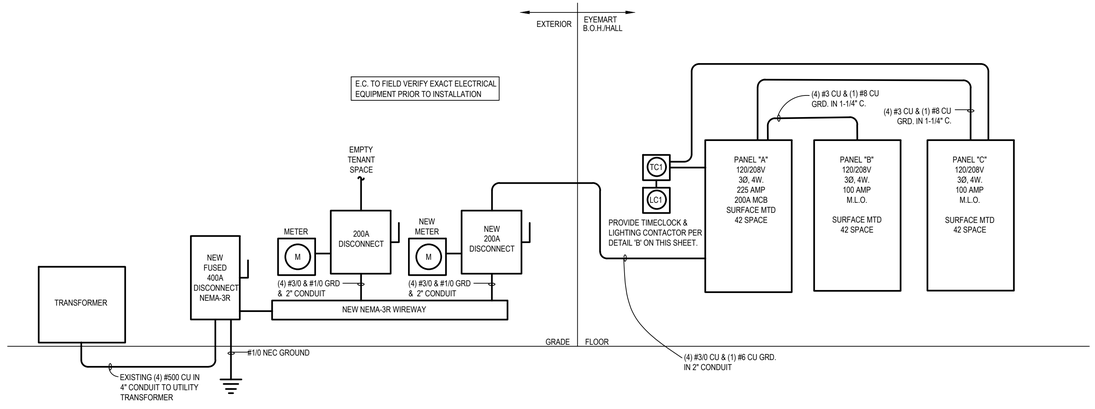


SERVICE ENTRANCE GROUNDING DETAIL
NO SCALE

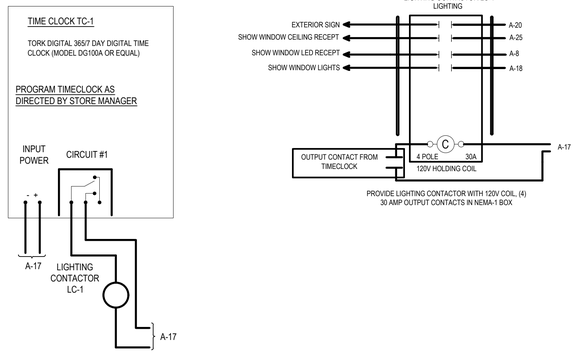
CODED NOTES:

1. ALL GROUNDING AND BONDING MUST COMPLY WITH NEC ARTICLE 250 AND/ OR LOCAL ORDINANCES.
2. USE NEC TABLE 250-66 TO SIZE BONDING CONDUCTORS/JUMPERS. BONDING JUMPERS MUST BE INSTALLED IN ACCORDANCE WITH NEC ARTICLE 250-68.
3A. BOND GROUND ROD, METAL WATER PIPE, BUILDING STEEL OR METAL (WHERE EFFECTIVELY GROUNDED) AND CONCRETE-ENCASED ELECTRODE (SEE CODED NOTE 7). CONNECTION TO METAL WATER PIPE SHALL BE MADE WITHIN 5 FEET OF POINT OF ENTRANCE OF PIPE PER NEC 250.52 (A) (1).
3B. ALTERNATE BONDING SCHEME: BOND GROUND ROD, BUILDING STEEL OR METAL (WHERE EFFECTIVELY GROUNDED) AND CONCRETE-ENCASED ELECTRODE (SEE CODED NOTE 7) TO METAL WATER PIPE. CONNECTIONS TO METAL WATER PIPE SHALL BE MADE WITHIN 5 FEET OF POINT OF ENTRANCE OF PIPE PER NEC 250.52 (A) (1).
4. LOCATE GROUND ROD OUTSIDE BUILDING WALL NEAR SERVICE ENTRANCE. IF MEASURED RESISTANCE BETWEEN GROUND ROD AND EARTH IS 25 OHMS OR LESS, A SINGLE GROUND ROD IS REQUIRED. IF MEASURED RESISTANCE IS GREATER THAN 25 OHMS, INSTALL SUPPLEMENTAL ELECTRODE, NOT LESS THAN 6'-0" APART FROM ORIGINAL GROUND ROD, PER NEC 250.53 (A) (2) & (3).
5. PROTECT GROUNDING AND BONDING CONDUCTORS WHERE THEY PENETRATE CONCRETE FOUNDATIONS.
6. SIZE CONDUCTOR PER NEC TABLE 250.66 AND NEC ARTICLE 250.66.
7. CONCRETE-ENCASED ELECTRODE ENCASED WITHIN AT LEAST 2 INCHES OF CONCRETE, LOCATED WITHIN AND NEAR THE BOTTOM OF A CONCRETE FOUNDATION OR FOOTING IN DIRECT CONTACT WITH THE EARTH, MINIMUM 20 FOOT LENGTH OF ELECTRICALLY CONDUCTIVE MATERIAL. SEE NEC 250.52 (A) (3).
8. SEE ELECTRICAL RISER FOR MINIMUM SIZE AWG COPPER - PER NEC 250.52 (A) (3).

250.50 GROUNDING ELECTRODE SYSTEM - ALL GROUNDING ELECTRODES AS DESCRIBED IN 250.52(A)(1) THROUGH (A)(7) THAT ARE PRESENT AT EACH BUILDING OR STRUCTURE SERVED SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM. WHERE NONE OF THESE GROUNDING ELECTRODES EXIST, ONE OR MORE OF THE GROUNDING ELECTRODES SPECIFIED IN 250.52(A)(4) THROUGH (A)(8) SHALL BE INSTALLED AND USED.



A ELECTRIC RISER DIAGRAMS



B LIGHTING CONTROL WIRING DIAGRAM

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CONSULTANT

PROJECT NAME

EYEMART EXPRESS
STORE #:
SITE LOCATION:
1041 NE SAM WALTON DR LEE'S SUMMIT, MO 64086

ENGINEER OF RECORD
STATE OF MISSOURI JAMES A. KNOCHEL NUMBER PE-2007012518 REGISTERED PROFESSIONAL ENGINEER
1-19-21

- 10-28-2020 Permit
- 1 10-29-2020 Bldg. Dept. Comments
- 2 01-14-2021 Revision
- 3 01-19-2021 Revision

✱ INDICATES AFFECTED SHEETS

ELECTRICAL DETAILS

DATE: 01-19-2021
PROJECT NUMBER: EYEM101520LSMO
SHEET NUMBER: **E4.1**