

# CITY OF CHARLOTTESVILLE



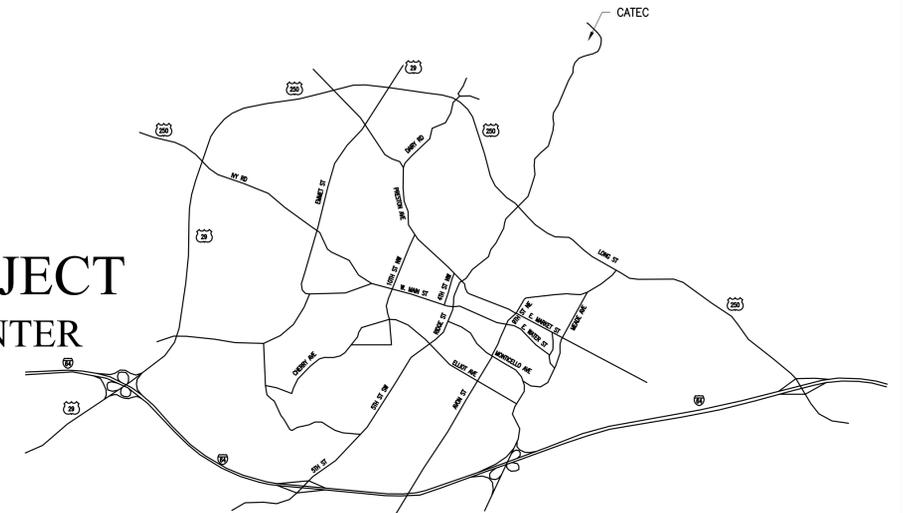
## PROJECT CONTACTS

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## ELECTRICAL EQUIPMENT REPLACEMENT PROJECT CHARLOTTESVILLE-ALBERMARLE TECHNICAL EDUCATION CENTER

1000 RIO RD E.  
CHARLOTTESVILLE, VA 22901



VICINITY MAP

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PROJECT NUMBER: 653-014

# SPECIFICATIONS

## REFERENCE STANDARDS

1. NATIONAL ELECTRICAL CODE (NFPA NO.70).....NEC
2. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION.....NEMA
3. UNDERWRITERS LABORATORIES, INC. ....UL
4. UNIFORM STATE BUILDING CODE .....VUSBC

## 260000- ELECTRICAL GENERAL REQUIREMENTS

### A. SUBMITTALS: SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1. POWER SYSTEM ANALYSIS
2. SWITCHBOARDS
3. PANELBOARDS
4. MOTOR CONTROL CENTERS

### B. PROJECT SCOPE DIVIDED INTO THREE PHASES. SEE SCHEDULES AND ONE LINE DIAGRAM FOR PHASING. REFER TO FRONT END DOCUMENTS AND BID SHEET FOR BIDDING INSTRUCTIONS. ALL WORK DEPICTED ON DRAWINGS SHALL BE CONSIDERED PHASE 1, UNLESS SPECIFICALLY NOTED OTHERWISE.

### C. NAMEPLATES: SHALL BE CONSTRUCTED OF LAMINATED PHENOLIC WITH A BLACK CENTER CORE SANDWICHED BETWEEN WHITE LAYERS. LETTERS SHALL BE ENGRAVED IN THE PHENOLIC TO FORM LETTERS 3/8 INCHES HIGH, UNLESS INDICATED OTHERWISE ON DRAWINGS. FASTENERS SHALL BE SCREWS OR A NON-ADHESIVE TYPE FASTENER. INSTALL NAMEPLATES ON ALL, NEW SWITCHBOARDS AND PANELBOARDS.

### D. PRIOR TO SUBMITTING A BID FOR THIS WORK, BECOME FAMILIAR WITH THE DRAWINGS AND EXAMINE THE CONTRACT. THE CONTRACTOR WILL NOT BE ENTITLED TO ANY EXTRA COMPENSATION FOR FAILURE TO ALLOW FOR EXISTING CONDITIONS.

### E. SUBMITTING A BID WILL BE CONSIDERED EVIDENCE OF THE FACT THAT THE CONTRACTOR HAS INVESTIGATED AND IS FULLY AWARE OF EXISTING CONDITIONS AND IS ABLE TO COMPLETE ALL WORK REQUIRED BY THE CONTRACT. IT IS EXPECTED THAT THE CONTRACTOR VISIT THE SITE PRIOR TO BID TO VERIFY EXISTING CONDITIONS.

### F. PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE NEC.

### G. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED SUCH THAT PROPER WORKING CLEARANCES ARE MAINTAINED. WHERE THIS IS NOT POSSIBLE, CONSULT ENGINEER.

### H. ANY ADDITIONAL WIRING OR CONDUIT NECESSARY TO INSTALL NEW EQUIPMENT SHALL BE PROVIDED BY CONTRACTOR AT NO ADDITIONAL COST TO BID. CONTRACTOR SHALL USE SAME WIRING AND CONDUIT SIZES AND MATERIALS.

### I. PANELBOARD, SWITCHBOARD, AND MOTOR CONTROL CENTER DIRECTORY CARDS FOR ALL NEW EQUIPMENT SHALL BE UPDATED BEFORE PROJECT CLOSEOUT. CARDS SHALL BE TYPED NEATLY WITH NO HAND-WRITTEN CORRECTIONS. CIRCUITS LABELLED AS "SPARE?" ON SCHEDULES SHALL BE VERIFIED AS SPARE. IF FOUND NOT TO BE SPARE, CONTRACTOR SHALL TRACE CIRCUIT AND LABEL APPROPRIATELY. FOR ANY PANELBOARD WITH THE WORDS "TRACE ALL CIRCUITS" IN THE SCHEDULE HEADER, CONTRACTOR SHALL TRACE ALL CIRCUITS AND LABEL APPROPRIATELY.

### J. CONTRACTOR SHALL PROVIDE RED LINE DRAWINGS TO OWNER SHOWING DEVIATIONS IN SCHEDULES.

### K. CONTRACTOR SHALL PROVIDE AT LEAST 2 KEYS TO EACH PANELBOARD TO OWNER AT PROJECT CLOSE-OUT.

## 260201 - ELECTRIC SERVICE

### A. PROJECT CONDITIONS: CONTRACTOR SHALL COORDINATE WITH POWER COMPANY FOR REQUIREMENTS OF CT CABINET SECTION OF SERVICE ENTRANCE EQUIPMENT AND FOR ANY NECESSARY INTERRUPTION OF POWER IN ORDER TO INSTALL THE NEW EQUIPMENT. ANY AID-TO-CONSTRUCTION COSTS DUE TO THE POWER COMPANY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

## 260130 - REWORKING EXISTING SYSTEM

### A. OUTAGE TO ACCOMMODATE SWITCHBOARD REPLACEMENT SHALL BE NO LONGER THAN THREE CALENDAR DAYS AND SHALL TAKE PLACE OVER A LONG WEEKEND. COORDINATE TIMING WITH OWNER.

### B. GROUNDING: ENSURE NEW SERVICE ENTRANCE HAS A LINK BETWEEN NEUTRAL AND GROUND BUSES. ENSURE NEW SERVICE ENTRANCE GROUND BUS HAS CONNECTIONS TO THE FOLLOWING ELECTRODES, WHERE EXTANT:

1. GROUND ROD
2. METALLIC COLD WATER SERVICE
3. BUILDING STRUCTURE
4. UFER GROUND
5. OTHER METALLIC PIPING SYSTEMS IN THE FACILITY

## 260173 - POWER SYSTEM ANALYSIS

### A. SCOPE:

1. PROVIDE A POWER SYSTEM ANALYSIS CONSISTING OF AN INTEGRATED SHORT CIRCUIT STUDY, OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY AND ARC FLASH ANALYSIS. PROVIDE AS PART OF PHASE 1 SCOPE OF WORK.
2. INCLUDE ALL PORTIONS OF THE ELECTRICAL DISTRIBUTION SYSTEM FROM THE NORMAL AND ALTERNATE SOURCES OF POWER THROUGHOUT DISTRIBUTION SYSTEM. ALL NEW AND EXISTING EQUIPMENT DEPICTED ON ONE LINE DIAGRAMS SHALL BE INCLUDED IN THE STUDY, INCLUDING NEW PANEL "X" TRACED BY CONTRACTOR. INCLUDE EQUIPMENT IN ALL PHASES.
3. CONTRACTOR SHALL COLLECT ALL FIELD DATA NECESSARY FOR COMPLETING STUDY.

### B. QUALITY CONTROL: CALCULATIONS AND STUDIES SHALL BE PREPARED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE IN WHICH THE PROJECT IS

LOCATED. THE SUBMITTAL SHALL BE SEALED BY THE PROFESSIONAL ENGINEER.

### C. ARC FLASH ANALYSIS:

#### 4. SHALL CONFORM TO NFPA 70E AND IEEE STANDARD 1584-2002, THE IEEE GUIDE FOR PERFORMING ARC FLASH CALCULATIONS.

#### 5. SHALL INCLUDE THE FOLLOWING EQUIPMENT:

- a. SERVICE ENTRANCE EQUIPMENT
- b. PANELBOARDS
- c. METER SOCKET ENCLOSURES
- d. MOTOR CONTROL CENTERS

#### 3. ARC FLASH LABELS SHALL COMPLY WITH RELEVANT NEC AND NFPA STANDARDS AS WELL AS UL 969.

### D. EXECUTION:

#### 1. PREPARE THE POWER SYSTEM ANALYSIS AS SPECIFIED ABOVE AND SUBMIT THROUGH SHOP DRAWING PROCESS FOR ENGINEER COMMENT.

#### 2. INSTALL ARC FLASH INCIDENT ENERGY LABELS ON ALL EQUIPMENT, NEW AND EXISTING, INVOLVED IN THE PROJECT IN ACCORDANCE WITH NFPA 70E.

#### 3. CONTRACTOR TO ADJUST BREAKERS PER RECOMMENDATIONS OF STUDY.

#### 4. CONTRACTOR SHALL PROVIDE OWNER WITH ELECTRONIC COPY OF STUDY FILE SO THAT NEW LABELS CAN BE PRINTED WHEN EQUIPMENT IS REPLACED IN FUTURE PHASES.

## 262413 - SWITCHBOARDS

### A. SWITCHBOARD SHALL BE SERVICE-ENTRANCE-RATED AND INCLUDE A CT CABINET SECTION, COMPLIANT WITH POWER COMPANY STANDARDS,

### B. DIMENSIONS OF EXISTING SWITCHBOARD ARE SHOWN ON DRAWINGS. NEW SWITCHBOARD SHALL BE SIMILAR IN SIZE TO ACCOMMODATE EXISTING CONDUIT ENTRY.

### C. PROVIDE SWITCHBOARD FROM ONE OF THE FOLLOWING MANUFACTURERS: ABB/GE, EATON, SIEMENS, OR SQUARE D.

### D. SERVICE ENTRANCE ENCLOSURES SHALL BE MODULAR TYPE CONSTRUCTION AND SHALL CONFORM TO THE REQUIREMENTS ESTABLISHED BY UL, NEMA AND THE NEC, EXCEPT WHERE MODIFIED HEREIN. EACH SHALL BE SUITABLE FOR ITS INTENDED APPLICATION AS SCHEDULED, CONSIDERING VOLTAGE, PHASE, FREQUENCY AND INTENDED SERVICE. ALL SWITCHBOARDS SHALL BE UL LISTED AND SHALL BE SO LABELED.

### E. SWITCHBOARD SHALL BE RIGID, SELF-SUPPORTING, COMPLETELY METAL ENCLOSED STATIONARY STRUCTURES, CONSISTING OF BUS ASSEMBLY, CIRCUIT BREAKERS, TRIM, AND ALL ACCESSORIES AS INDICATED AND REQUIRED. ALL CHARACTERISTICS SHALL BE AS SHOWN ON SCHEDULES ON THE DRAWINGS.

### F. EQUIPMENT SHALL INCLUDE GROUND AND NEUTRAL BUSES AND SHALL BE BONDED TOGETHER WITH JUMPER SIZED IN ACCORDANCE WITH THE NEC.

### G. CT COMPARTMENT SHALL COMPLY WITH REQUIREMENTS OF POWER COMPANY. (DOMINION). CONTRACTOR RESPONSIBLE FOR COORDINATING THESE DETAILS WITH POWER COMPANY.

### H. INCOMING SERVICE: INCOMING LINE LUG COMPARTMENT TO ISOLATE INCOMING SERVICE CONDUCTORS. THIS COMPARTMENT SHALL BE OF THE BUSSED TYPE. MECHANICAL LUGS, LUGS TO TERMINATE, ALUMINUM, CABLE, SHALL BE FURNISHED. LUGS SHALL BE SUFFICIENT TO TERMINATED EXISTING SERVICE ENTRANCE CONDUCTORS. CONTRACTOR SHALL FIELD VERIFY SIZE AND QUANTITY OF CONDUCTORS.

### I. EQUIPMENT SHALL BE SERVICE ENTRANCE RATED. SERVICE DISCONNECT SHALL BE A 100% RATED, ELECTRONIC TRIP, LSIG CIRCUIT BREAKER. BREAKER SHALL HAVE AN ENERGY-REDUCING MAINTENANCE SWITCH FUNCTION TO MEET NEC 240.87(B)

### J. IN ADDITION TO ARC FLASH LABEL, INSTALL LABEL ON SWITCHBOARD STATING THE FOLLOWING:

1. NOMINAL SYSTEM VOLTAGE
2. AVAILABLE FAULT CURRENT AT THE SERVICE OVERCURRENT PROTECTIVE DEVICE (BASED ON SHORT CIRCUIT STUDY)
3. THE CLEARING TIME OF SERVICE OVERCURRENT PROTECTIVE DEVICE BASED ON THE AVAILABLE FAULT CURRENT
4. DATE LABEL APPLIED

### K. FURNISH SWITCHBOARD WITH A SURGE PROTECTIVE DEVICE (SPD) HAVING THE FOLLOWING QUALITIES.

1. UNIT OPERATING VOLTAGE - REFER TO DRAWINGS FOR OPERATING VOLTAGE AND UNIT CONFIGURATION.
2. MAXIMUM CONTINUOUS OPERATING VOLTAGE (MCOV) - THE MCOV SHALL NOT BE LESS THAN 115% OF THE NOMINAL SYSTEM OPERATING VOLTAGE.
3. SPD SHALL BE A TYPE 1 AND HAVE A MINIMUM SURGE CURRENT CAPACITY OF 250KA PER PHASE, 125KA PER MODE.
4. THE SPD'S SHALL BE MAINTENANCE FREE AND SHALL NOT REQUIRE ANY USER INTERVENTION THROUGHOUT ITS LIFE. SPD'S CONTAINING ITEMS SUCH AS REPLACEABLE MODULES, REPLACEABLE FUSES, OR REPLACEABLE BATTERIES SHALL NOT BE ACCEPTED. SPD'S REQUIRING ANY MAINTENANCE OF ANY SORT SUCH AS PERIODIC TIGHTENING OF CONNECTIONS SHALL NOT BE ACCEPTED. SPD'S REQUIRING USER INTERVENTION TO TEST THE UNIT VIA A DIAGNOSTIC TEST KIT OR SIMILAR DEVICE SHALL NOT BE ACCEPTED.
5. ELECTRICAL NOISE FILTER: EACH UNIT SHALL INCLUDE A HIGH-PERFORMANCE EMI/RFI NOISE REJECTION FILTER. NOISE

ATTENUATION FOR ELECTRIC LINE NOISE SHALL BE UP TO 50 DB FROM 10 KHZ TO 100 MHZ USING THE MIL-STD-220A INSERTION LOSS TEST METHOD. PRODUCTS UNABLE TO MEET THIS SPECIFICATION SHALL NOT BE ACCEPTED.

### 6. SURGE COUNTER: THE SPD SHALL BE EQUIPPED WITH AN LCD DISPLAY THAT INDICATES TO THE USER HOW MANY SURGES HAVE OCCURRED AT THE LOCATION.

### J. WARRANTY PERIOD SHALL BE THREE YEARS FROM SUBSTANTIAL COMPLETION. MANUFACTURER SHALL AGREE TO REPAIR OR REPLACE SERVICE ENTRANCE EQUIPMENT ENCLOSURE, BUSWORK, OVERCURRENT PROTECTIVE DEVICES, ACCESSORIES, SPD'S, AND FACTORY-INSTALLED INTERCONNECTION WIRING THAT FAIL IN MATERIALS OR WORKMANSHIP DURING THIS PERIOD.

## 262416 - PANELBOARDS

### A. GENERAL

#### 1. PANELBOARDS SHALL BE OF DEAD FRONT CONSTRUCTION AND SHALL CONFORM TO THE REQUIREMENTS ESTABLISHED BY UL, NEMA AND THE NEC, EXCEPT WHERE MODIFIED HEREIN. EACH SHALL BE SUITABLE FOR ITS INTENDED APPLICATION AS SCHEDULED, CONSIDERING VOLTAGE, PHASE, FREQUENCY AND INTENDED SERVICE. ALL PANELBOARDS SHALL BE UL LISTED AND SHALL BE SO LABELED.

#### 2. PANELS KNOWN AS "LOADCENTERS" WILL NOT BE ACCEPTED.

#### 3. PANELBOARDS SHALL CONSIST OF CABINET OR BACK BOX, BUS ASSEMBLY, CIRCUIT BREAKERS, TRIM, AND ALL ACCESSORIES AS INDICATED AND REQUIRED. ALL CHARACTERISTICS SHALL BE AS SHOWN OR SCHEDULED ON THE DRAWINGS.

### B. CABINETS:

#### 1. CABINETS SHALL BE NEMA 1 ENCLOSURES IF INSTALLED INDOORS, AND NEMA 3R ENCLOSURES IF INSTALLED OUTDOORS.

#### 2. CABINETS OR BACK BOXES SHALL BE FABRICATED FROM GALVANIZED OR EQUIVALENT RUST RESISTANT SHEET STEEL OF THICKNESS TO MEET CODE REQUIREMENTS.

#### 3. CABINET DEPTHS SHALL BE THE MANUFACTURER'S STANDARD EXCEPT WHERE SPECIFIC REQUIREMENTS INDICATED OTHERWISE.

#### 4. GUTTER SPACE SHALL MEET UL AND NEC REQUIREMENTS.

### C. BUS

#### 1. THE BUS ASSEMBLY SHALL CONSIST OF COPPER OR ALUMINUM BUS STRUCTURE, SECURED AND ARRANGED TO RECEIVE BREAKERS AS INDICATED.

#### 2. ALL BUSSING SHALL BE DESIGNED IN ACCORDANCE WITH UL STANDARDS TO SUIT THE LOADING REQUIREMENTS AS SCHEDULED AND SHALL BE MAGNITUDE TO WITHSTAND MECHANICAL STRESSES CREATED BY FAULTS OF BRACED TO THE RATING OF BREAKERS TO BE INSTALLED.

#### 3. BUS ASSEMBLY SHALL INCLUDE MAIN LUGS OR MAIN BREAKERS AS INDICATED.

#### 4. ARRANGEMENT SHALL ALSO INCLUDE DOUBLE ROW CONSTRUCTION OF BREAKERS AND ALLOWANCE FOR BREAKER REPLACEMENT FROM THE FRONT WITHOUT DISTURBING ADJACENT UNITS OR MAIN BUS CONNECTIONS. BUS AND MOUNTING PAN SHALL BE DESIGNED SO THAT CIRCUIT BREAKERS MAY BE CHANGED OR ADDED WITHOUT ADDITIONAL MACHINING, DRILLING OR TAPPING.

#### 5. CONNECTIONS TO ALUMINUM BUS BARS SHALL HAVE SPECIAL COATING, SUCH AS PLATING OR INHIBITING COMPOUND, TO PREVENT ELECTROLYSIS. BELLEVILLE WASHERS SHALL BE USED TO PREVENT COLD FLOW.

#### 6. PHASE AND NEUTRAL BUS SUPPORTS SHALL BE INSULATED.

#### 7. CONSTRUCTION SHALL BE SUCH THAT THE BUS WILL NOT BE EXPOSED UPON REMOVAL OF TRIM.

#### 8. PROVISIONS SHALL BE INCLUDED FOR ADJUSTMENT OF BUS ASSEMBLY AND BREAKERS FOR SOME VERTICAL ALIGNMENT AND FRONT-TO-BACK POSITION WITHOUT REMOVAL OF THE ASSEMBLY.

#### 9. ALL PANELBOARDS SHALL BE PROVIDED WITH INSULATED SOLID NEUTRALS.

#### 10. GROUNDING BARS WITH LUGS SHALL BE PROVIDED ON ALL PANELBOARDS. BUSES SHALL BE BONDED TO PANEL ENCLOSURE.

#### 11. SPACE WHERE SHOWN IN PANEL SCHEDULES DESIGNATES SPACE FOR FUTURE PROTECTIVE DEVICES AND SHALL INCLUDE BUS AND SUPPORT COMPONENTS.

### D. CIRCUIT BREAKERS: CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE. BREAKERS SMALLER THAN 400 AMPERE-TRIP SHALL BE THERMAL MAGNETIC. BREAKERS 400 AMPERE-TRIP OR LARGER SHALL HAVE ELECTRONIC TRIP UNITS WITH FULL LSI FUNCTIONALITY.

### E. PANELBOARD FRONTS:

#### 1. PANELBOARD FRONTS SHALL BE OF COLD ROLLED STEEL IN ACCORDANCE WITH GAUGES REQUIRED BY CODE.

#### 2. TRIM SHALL BE FASTENED TO BOX BY MEANS OF CLAMPS WHICH INDICATE THEIR POSITION FROM THE FRONT. TRIM CLAMPS SHALL BE CONCEALED TO PRESENT A FLAT SMOOTH APPEARANCE. THE USE OF SCREWS ENGAGING HOLES IN THE BOX FLANGE FOR FASTENING TRIM WILL NOT BE ACCEPTABLE.

#### 3. DOORS SHALL BE FASTENED TO TRIM BY FLUSH CONCEALED HINGES AND

EQUIPPED WITH A FLUSH TYPE COMBINATION CATCH AND KEYED LOCK. TWO MILLED TYPE KEYS SHALL BE PROVIDED WITH EACH PANEL, AND ALL LOCKS SHALL BE KEYED ALIKE. DOORS SHALL BE EQUIPPED WITH A NEAT DIRECTORY FRAME SECURED TO THE INSIDE OF THE DOOR.

### 4. TRIM AND DOORS SHALL BE PROPERLY CLEANED AND FINISHED WITH ONE RUST-INHIBITING PRIMING COAT AND A FINISH COAT OF LIGHT GRAY ENAMEL, ANSI Z55.1\_1967 NO. 61. ALL CIRCUITS SHALL BE IDENTIFIED AS SPECIFIED HEREINAFTER.

### F. MINIMUM SHORT CIRCUIT RATING: THE MINIMUM SHORT CIRCUIT RATING FOR THE PANELBOARD SHALL BE THE RATING OF THE DEVICE WITHIN THE ASSEMBLY HAVING THE LOWEST SHORT CIRCUIT RATING. MAXIMIZATION OF SELECTIVE TRIPPING COORDINATION IS THE INTENT OF THIS DESIGN. USE OF SERIES RATED EQUIPMENT WILL NOT BE APPROVED. RATING OF PANELBOARD SHALL BE ADEQUATE TO INTERRUPT CALCULATED FAULT CURRENT AVAILABLE.

### G. ACCEPTABLE MANUFACTURERS: EATON, GENERAL ELECTRIC, SIEMENS OR SQUARE D. CONTRACTOR RESPONSIBLE FOR VERIFYING ALL DIMENSIONS IN FIELD.

### H. WARRANTY PERIOD SHALL BE THREE YEARS FROM SUBSTANTIAL COMPLETION. MANUFACTURER SHALL AGREE TO REPAIR OR REPLACE SWITCHBOARD ENCLOSURE, BUSWORK, OVERCURRENT PROTECTIVE DEVICES, ACCESSORIES, AND FACTORY-INSTALLED INTERCONNECTION WIRING THAT FAIL IN MATERIALS OR WORKMANSHIP DURING THIS PERIOD.

### I. WHERE PANELBOARDS RECESSED IN WALL ARE REPLACED, CONTRACTOR RESPONSIBLE FOR PATCHING AND PAINTING WALL SURFACE TO EXISTING CONDITIONS.

## 262419 - MOTOR CONTROL CENTERS

### A. MOTOR CONTROL CENTERS (MCC) SHALL CONSIST OF A STRUCTURE OR GROUPING OF STRUCTURES WITH POWER BUS, FEED FOR POWER BUS, AND VARIOUS TYPES OF UNITS AND OPTIONS FOR THE UNITS.

### B. EACH MCC SHALL BE OF DEAD FRONT CONSTRUCTION AND SHALL INCORPORATE HORIZONTAL AND VERTICAL POWER BUS, GROUND BUS AND NEUTRAL BUS BARS AS REQUIRED.

### C. THE MCC SHALL CONSIST OF ONE OR MORE VERTICAL SECTIONS BOLTED TOGETHER TO FORM A RIGID, FREE-STANDING ASSEMBLY AND SHALL BE SO DESIGNED AS TO PERMIT FUTURE ADDITIONS OF VERTICAL SECTIONS AND INTERCHANGING OF UNITS BY THE USER.

### D. MCCS SHALL BE CONSTRUCTED TO MEET OR EXCEED THE REQUIREMENTS OF THE LATEST PUBLISHED STANDARDS OF NEMA AND UL FOR MOTOR CONTROL CENTERS. EACH SECTION SHALL BE PROVIDED WITH A UL STICKER.

### E. MCC SHALL HAVE A MAXIMUM FOOTPRINT OF THE EXISTING MCC. HEIGHT SHALL BE LIMITED TO WHAT IS FEASIBLE FOR CONTRACTOR TO MOVE INTO ROOM AND INSTALL. LOADS SHALL BE DIVIDED INTO THE FEWEST QUANTITY OF VERTICAL SECTIONS REQUIRED.

### F. THE POWER BUS SYSTEM SHALL BE EITHER ALUMINUM OR COPPER, SUPPORTED, BRACED AND ISOLATED BY A BUS SUPPORT MOLDED OF A HIGH STRENGTH, NON-TRACKING GLASS POLYESTER MATERIAL. HORIZONTAL AND VERTICAL BUSES SHALL BE FASTENED TOGETHER WITH A BUS CLAMP ASSEMBLY. MINIMUM BUS BRACING RATING SHALL EQUAL OR EXCEED THE SHORT CIRCUIT RATING SHOWN ON THE MCC SCHEDULES.

### G. THE GROUND BUS SHALL BE HORIZONTAL, TIN PLATED COPPER AND SHALL BE LOCATED IN THE TOP OR BOTTOM HORIZONTAL WIREWAY. THE BUS SHALL BE RATED 300 AMPERES, MINIMUM.

### H. MAIN LUGS ONLY (MLO): THE MAIN INCOMING LINE LUG COMPARTMENT SHALL BE TOP ENTRY AND SHALL UTILIZE MECHANICAL OR CRIMP COMPRESSION LUGS.

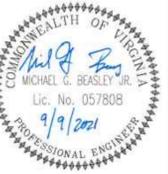
### I. STARTER AND CONTROL UNITS SHALL CONSIST OF A NEMA-RATED (AND UL LISTED) MAGNETIC STARTER AND CIRCUIT BREAKER. STARTERS SHALL BE NEMA-RATED OF SIZE AND TYPE NOTED ON DRAWINGS. WHERE NOT TYPE IS LISTED, ONLY A BREAKER IS NECESSARY. ALL BREAKERS SHALL BE MOLDED CASE CIRCUIT BREAKERS WITH ELECTRONIC TRIPS. BREAKERS SHALL HAVE INSTANTANEOUS ADJUSTMENTS. 2 NORMALLY-OPEN AND 2 NORMALLY CLOSED CONTACTS SHALL BE PROVIDED PER STARTER.

### J. ACCEPTABLE MANUFACTURERS SHALL BE GENERAL ELECTRIC, ALLEN-BRADLEY, EATON, SIEMENS AND SQUARE D.

## ABBREVIATIONS

AF	AMPERE FRAME	MIN	MINIMUM
AFF	ABOVE FINISHED FLOOR	N, NEUT	NEUTRAL
AIC	AMPERES INTERRUPTING CAPACITY	N/A	NOT APPLICABLE
AMPS	AMPERES	NTS	NOT TO SCALE
AT	AMPERE TRIP	P	POLE
C	CONDUIT	REC	RECEPTACLE
CKT	CIRCUIT	RMS	ROOT MEAN SQUARE
EGC	EQUIPMENT GROUNDING CONDUCTOR	SYM	SYMMETRICAL
ETR	EXISTING TO REMAIN	TYP	TYPICAL
GND	GROUND	UON	UNLESS OTHERWISE NOTED
KVA	KILOVOLT-AMPERES	V	VOLTS
KW	KILOWATTS		
L	LINE		
MAX	MAXIMUM		
MCCB	MOLDED CASE CIRCUIT BREAKER		

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ELECTRICAL EQUIPMENT  
REPLACEMENT PROJECT  
CHARLOTTESVILLE, VA 22903

SPECIFICATIONS &  
ABBREVIATIONS

DATE ISSUED: 09/09/21

SCALE: NONE

JOB. NO. 653-014

DESIGNED: JHR

DRAWN: JHR

CHECKED: MGB

APPROVED: MGB

DRAWING NO.

E.O. 1

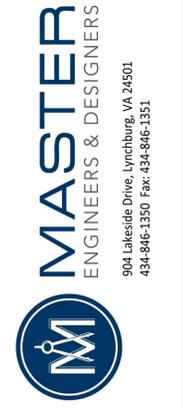
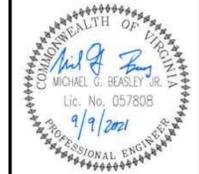
SHEET 1 OF 14

REVISION

REVISIONS:  
 1. 2021-10-12  
 PANEL "A"

**NOTES (SHEET NO. E0.1)**

1. NUMBERS IN PARENTHESIS INDICATE PHASE UNDER WHICH EQUIPMENT IS REPLACED.
2. AN UNLABELED NEW PANEL HAS BEEN INSTALLED IN THE MECHANICAL CLOSET IN THE COSMETOLOGY ARE OF BUILDING. CONTRACTOR SHALL TRACE POWER SOURCE AND REDLINE PANEL ON ONE LINE DIAGRAM. CONTRACTOR SHALL LABEL PANEL AS PANEL "X".

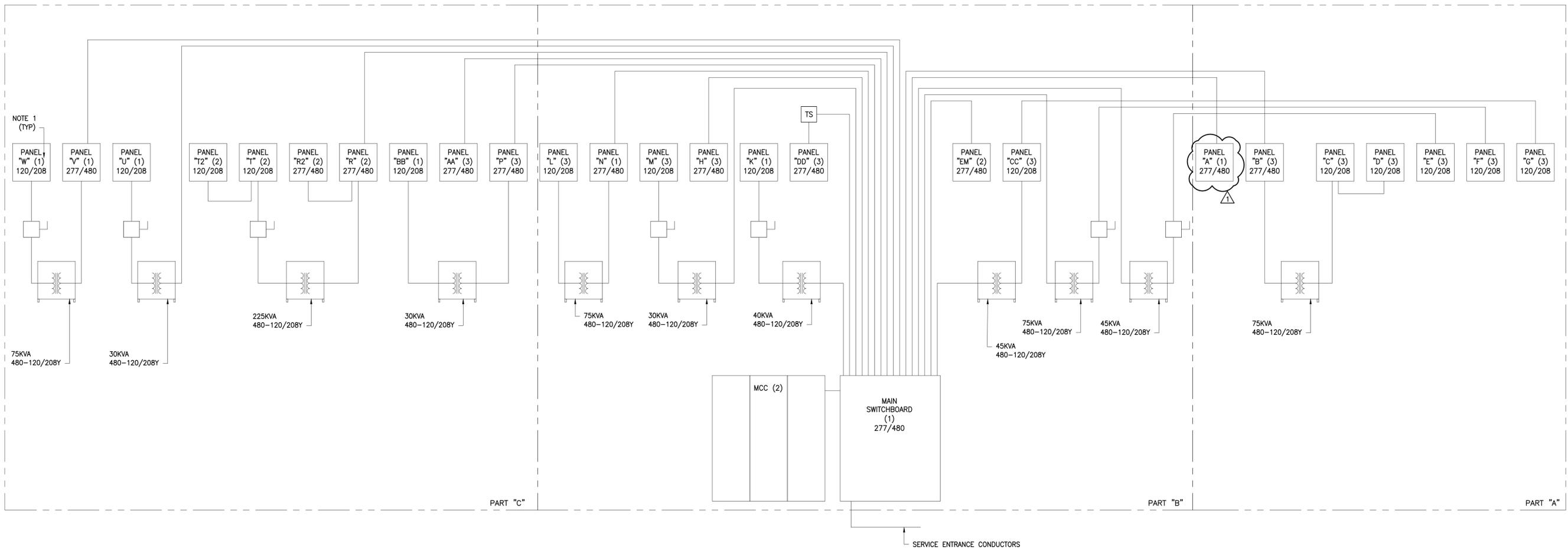


**CATEC**  
**ELECTRICAL EQUIPMENT**  
**REPLACEMENT PROJECT**  
 CHARLOTTESVILLE, VA 22903

**ONE-LINE DIAGRAM**

DATE ISSUED: 09/09/21  
 SCALE: NONE  
 JOB. NO. 653-014  
 DESIGNED: JHR  
 DRAWN: JHR  
 CHECKED: MGB  
 APPROVED: MGB

DRAWING NO. E1.1  
 SHEET 2 OF 14  
 REVISION

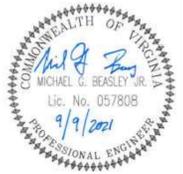


**ONE-LINE DIAGRAM**  
 SCALE: NOT TO SCALE

REVISIONS:

NOTES (SHEET NO. E2.1)

- 1. WIRE EXISTING EPO BUTTON TO SHUNT TRIP MAIN BREAKER IN PANEL "V". PROVIDE CONTROL POWER TO SHUNT TRIP BREAKER IN PANEL "V" FROM PANEL "W" SPARE BREAKER. USE 3/4" EMT TO CONCEAL WIRING.
- 2. DURING PHASE WHICH PANEL "R" IS REPLACED, IF NEW PANELBOARD IS WIDER THAN EXISTING, IT WILL BE NECESSARY TO MOVE LIGHT SWITCH TO ACCOMMODATE.



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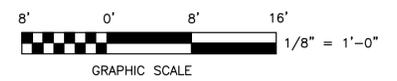
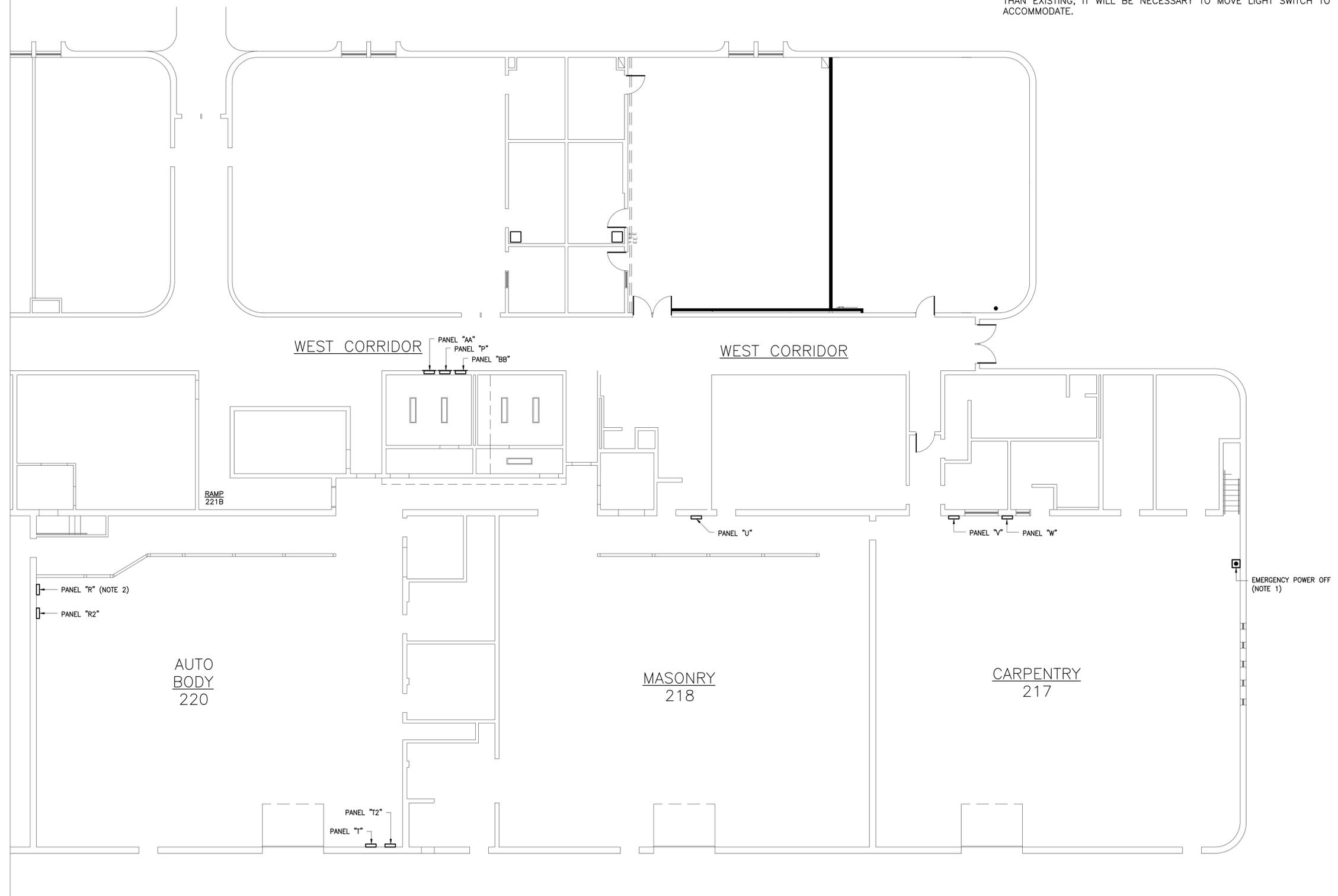
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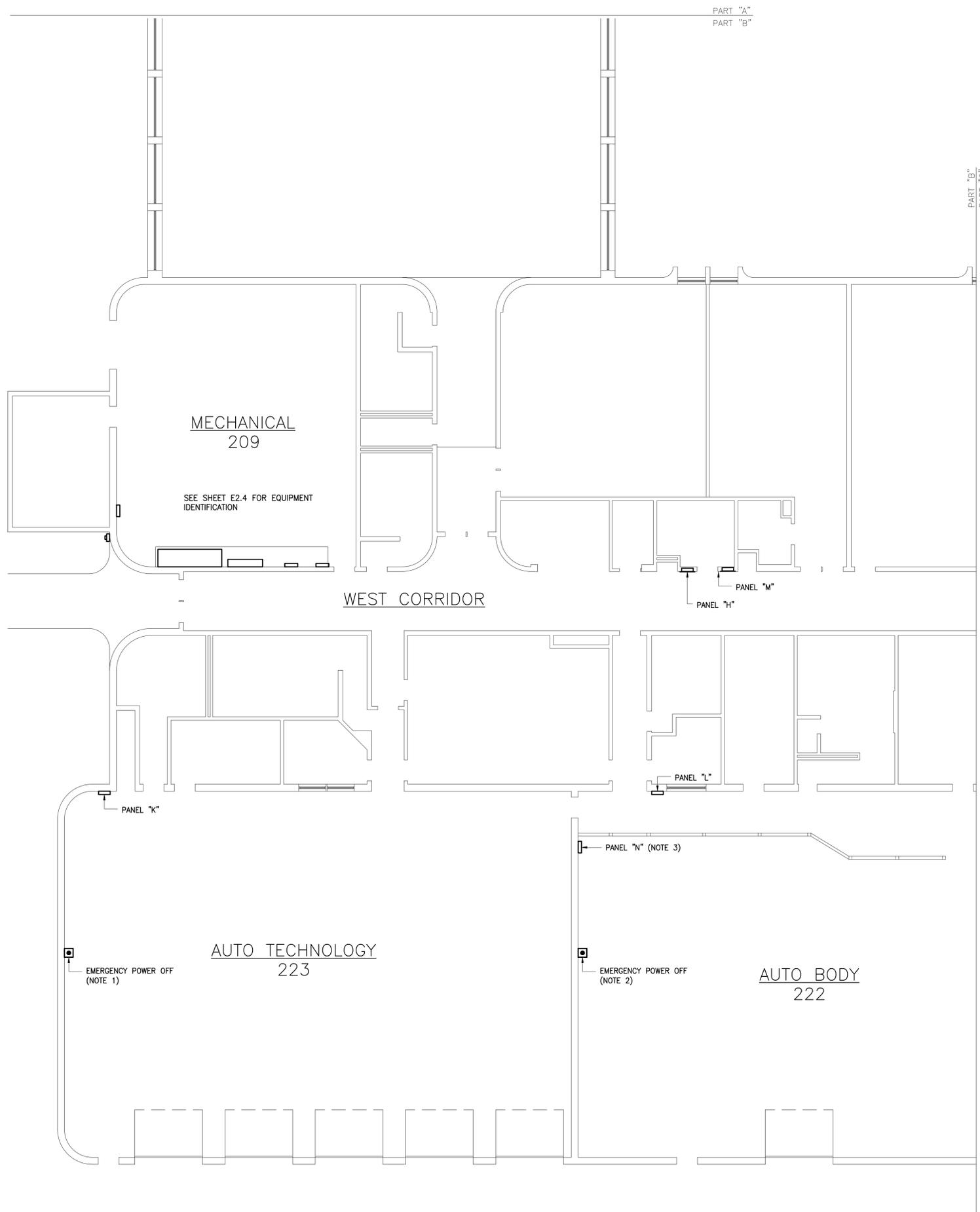
FLOOR PLANS (1 OF 3)

DATE ISSUED: 09/09/21  
SCALE: 1/8"=1'-0"  
JOB. NO. 653-014  
DESIGNED: JHR  
DRAWN: JHR  
CHECKED: MGB  
APPROVED: MGB

DRAWING NO.  
**E2.1**  
SHEET 3 OF 14  
REVISION

PART "B"  
PART "C"





**NOTES (SHEET NO. E2.2)**

1. WIRE EXISTING EPO BUTTON TO SHUNT TRIP MAIN BREAKER IN PANEL "K". PROVIDE CONTROL POWER TO SHUNT TRIP BREAKER FROM PANEL "K".
2. WIRE EXISTING EPO BUTTON TO SHUNT TRIP MAIN BREAKER IN PANEL "N". PROVIDE CONTROL POWER TO SHUNT TRIP BREAKER IN PANEL "L" FROM PANEL "W" SPARE BREAKER. USE 3/4" EMT TO CONCEAL WIRING.
2. DURING PHASE WHICH PANEL "N" IS REPLACED, IF NEW PANELBOARD IS WIDER THAN EXISTING, IT WILL BE NECESSARY TO MOVE LIGHT SWITCH TO ACCOMMODATE.

REVISIONS:



**MASTER**  
ENGINEERS & DESIGNERS

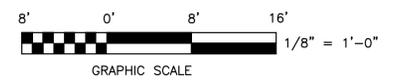
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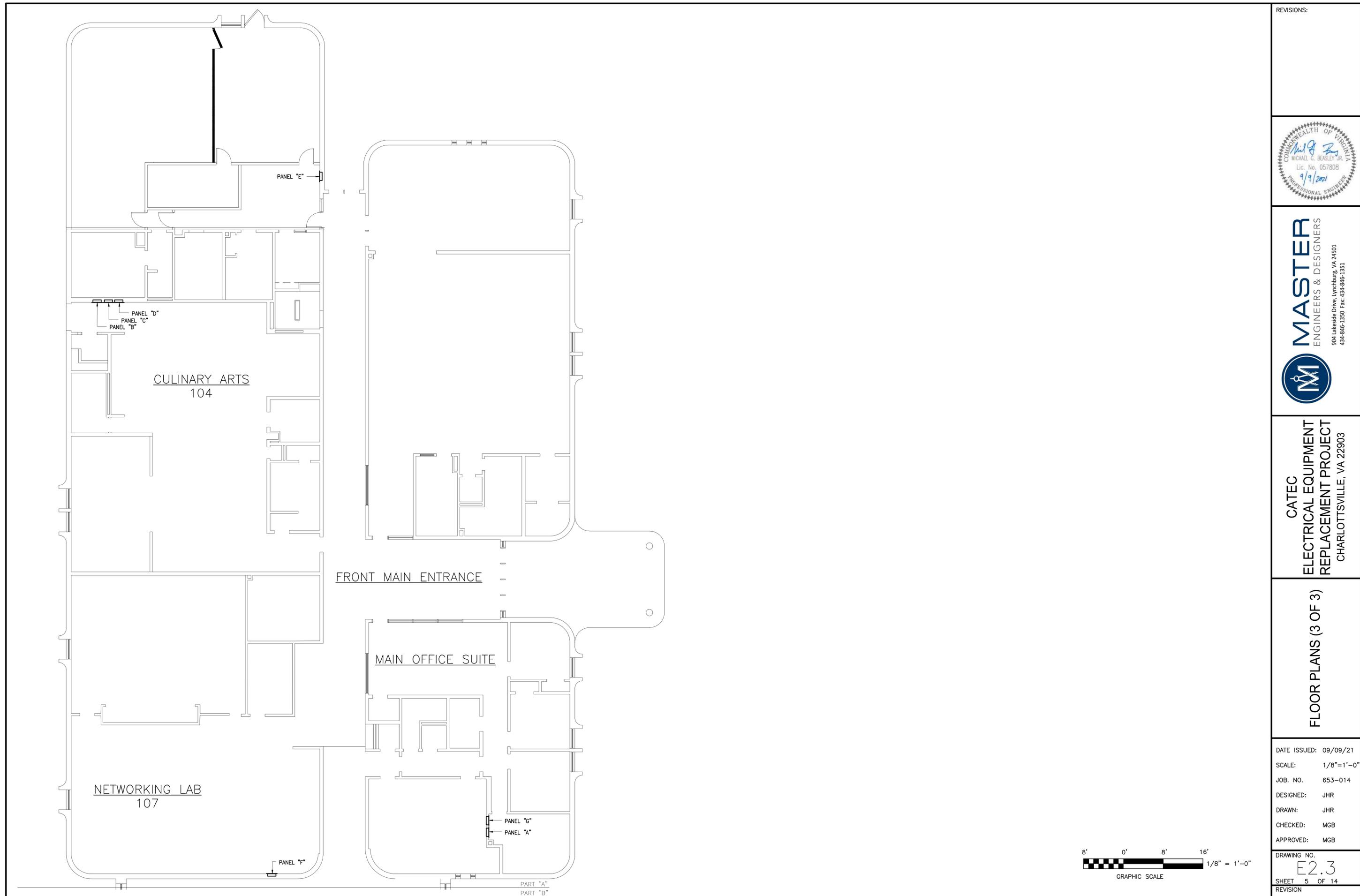
CATEC  
ELECTRICAL EQUIPMENT  
REPLACEMENT PROJECT  
CHARLOTTESVILLE, VA 22903

FLOOR PLANS (2 OF 3)

DATE ISSUED: 09/09/21  
SCALE: 1/8"=1'-0"  
JOB. NO. 653-014  
DESIGNED: JHR  
DRAWN: JHR  
CHECKED: MGB  
APPROVED: MGB

DRAWING NO.  
**E2.2**  
SHEET 4 OF 14  
REVISION





REVISIONS:



**MASTER**  
ENGINEERS & DESIGNERS  
904 Lakeside Drive, Lynchburg, VA 24501  
434-846-1350 Fax: 434-846-1351

CATEC  
ELECTRICAL EQUIPMENT  
REPLACEMENT PROJECT  
CHARLOTTESVILLE, VA 22903

FLOOR PLANS (3 OF 3)

DATE ISSUED: 09/09/21  
SCALE: 1/8"=1'-0"  
JOB. NO. 653-014  
DESIGNED: JHR  
DRAWN: JHR  
CHECKED: MGB  
APPROVED: MGB

DRAWING NO.  
**E2.3**  
SHEET 5 OF 14  
REVISION

REVISIONS:

### NOTES (SHEET NO. E2.4)

1. CONTRACTOR SHALL DEMOLISH EXISTING METER AND INSTALL NEW METER BASE OUTSIDE. CONNECT TO SWITCHBOARD CT SECTION WITH 1" RSC. COORDINATE WITH POWER COMPANY.
2. PRIOR TO BID, CONTRACTOR SHALL NOTE DIMENSIONAL CONSTRAINTS THAT WILL MAKE INSTALLATION OF NEW SWITCHBOARD DIFFICULT. DIMENSIONS OF EXISTING SWITCHBOARD ARE APPROXIMATELY 110" X 90" X 30"
3. OWNER TO MODIFY DOOR SUCH THAT IT SWINGS IN THE DIRECTION OF EGRESS AND IS EQUIPPED WITH LISTED PANIC HARDWARE.



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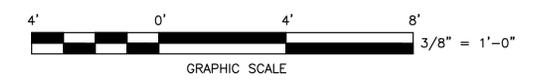
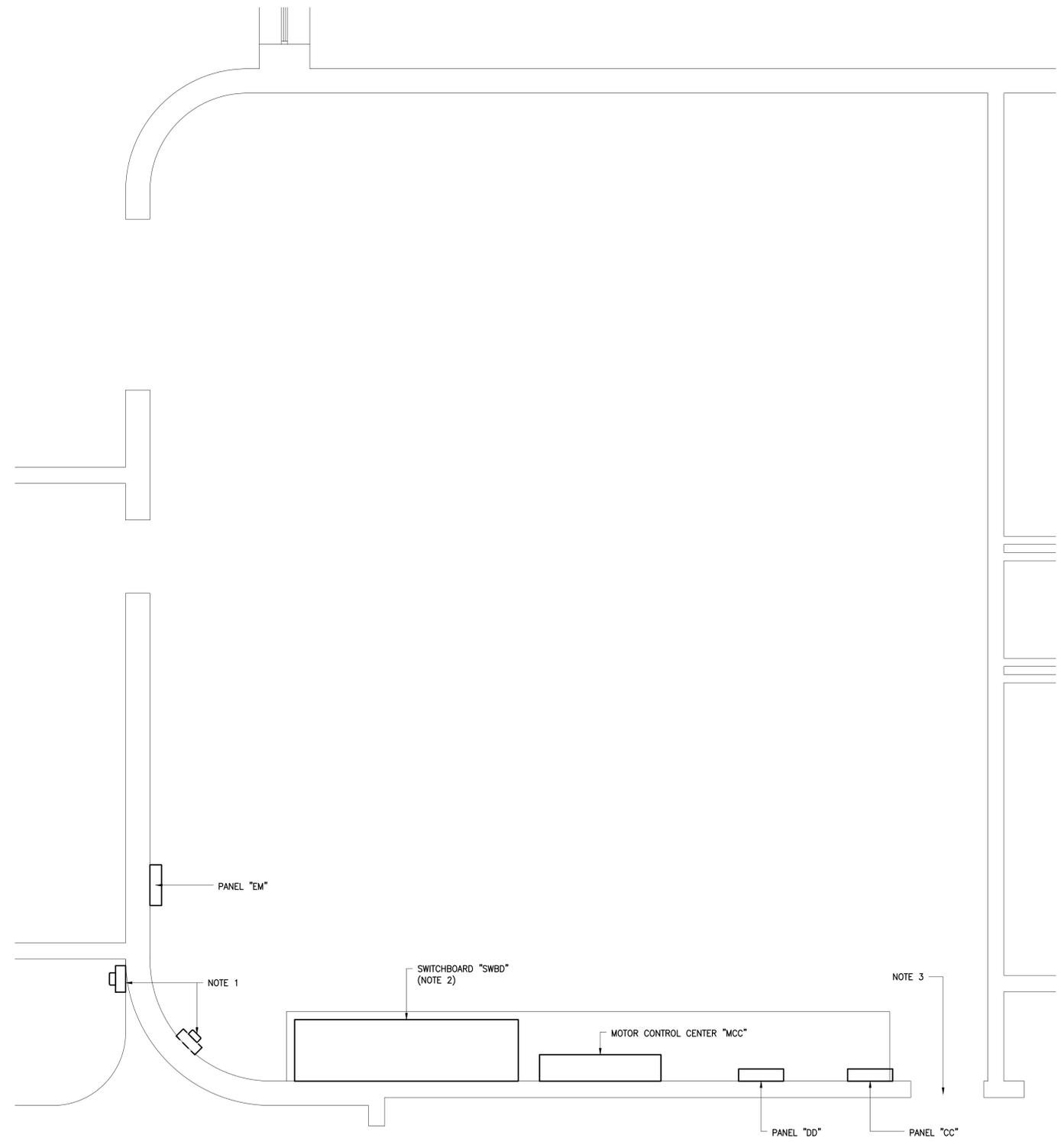


CATEC  
ELECTRICAL EQUIPMENT  
REPLACEMENT PROJECT  
CHARLOTTESVILLE, VA 22903

ENLARGED MECHANICAL  
ROOM PLAN

DATE ISSUED: 09/09/21  
SCALE: 3/8" = 1'-0"  
JOB. NO. 653-014  
DESIGNED: JHR  
DRAWN: JHR  
CHECKED: MGB  
APPROVED: MGB

DRAWING NO.  
**E2.4**  
SHEET 6 OF 14  
REVISION



# MAIN SWITCHBOARD SCHEDULE

SWITCHBOARD CHARACTERISTICS:  
 VOLTS: 277/480  
 PHASES: 3  
 WIRES: 4  
 SOLID NEUTRAL GROUND BAR

LOCATION: MECHANICAL E209 / E24  
 MAIN BREAKER: 2000 AF, 2000AT  
 SURGE PROTECTIVE DEVICE  
 MINIMUM SHORT CIRCUIT RATING: 42,000 RMS SYM AMPS

TRACE ALL CIRCUITS  
 SERVICE ENTRANCE RATED  
 PHASE 1

SPACE NO.	DESCRIPTION	CONNECTED			BREAKER CHARACTERISTICS								BRANCH CIRCUIT NO. & WIRE SIZE			CONDUIT SIZE			
		KVA	AMPS			P	AF	AT	LONG TIME		INST	SHORT TIME		GROUND FAULT			PHASE	NEUT.	EGC
			A	B	C				SETTING	DELAY (MIN)		SETTING	DELAY (MIN)	SETTING	DELAY (MIN)				
1	PANEL R				3	400	400	**	**	**	**	**	N/A	N/A	ETR	ETR	ETR	ETR	
2	PANEL B				3	100	300	**	**	**	**	**	N/A	N/A	ETR	ETR	ETR	ETR	
3	TRANSFORMER - PANELE				3	100	70	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
4	TRANSFORMER - PANEL F				3	100	100	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
5	TRANSFORMER - PANELS G & CC				3	100	70	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
6	PANEL H				3	225	150	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
7	TRANSFORMER - PANEL K				3	100	70	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
8	PANEL N				3	225	200	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
9	TRANSFORMER - PANEL M				3	100	50	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
10	SPARE				3	100	20	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
11	PANEL P				3	225	200	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
12	PANEL AA				3	225	125	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
13	PANEL A				3	400	400	**	**	**	**	**	N/A	N/A	ETR	ETR	ETR	ETR	
14	CHILLER STARTER				3	225	175*	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
15	TRANSFORMER - PANEL U				3	100	50	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
16	PANEL V				3	225	200	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
17	TRANSFORMER - ELECTRONICS LAB 30 KVA				3	100	40	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
18	TRANSFORMER - ELECTRONICS LAB 75 KVA				3	100	90	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
19	SPARE?				3	225	175	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
20	MOTOR CONTROL CENTER				3	225	225	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
21	AC UNIT DATA PROCESSING				3	100	60	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
22	AC UNIT DATA PROCESSING				3	100	30	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
23	PANEL DD				3	10	50	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
24	PUMP 1 (NOTE 1)				3	100	30	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
25	PUMP 2 (NOTE 1)				3	100	30	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
26	BOILER PUMPS #1, 2, 3 (NOTE 1)				3	100	20	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
27	SPARE				3	100	30	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
28	SPARE				3	100	20	**	**	N/A	N/A	N/A	N/A	N/A	ETR	ETR	ETR	ETR	
TOTALS																			

\*=> CONTRACTOR TO VERIFY SIZE IN FIELD PRIOR TO ORDER  
 \*\*=> SETTINGS PER COORDINATION STUDY

## NOTES (SHEET NO. E3.1)

1. AS PART OF PHASE 2 SCOPE, MOVE INDICATED CIRCUITS FROM MCC TO SWITCHBOARD. EXTEND WIRING AS NECESSARY. SWITCH CIRCUITS OVER TO SWITCHBOARD BEFORE DEMOLITION OF MCC.

2. NEW BREAKER INCLUDED IN NEW PANELBOARD TO SUPPORT FUTURE HOOD UPGRADE PROJECT. WHILE PANEL IS REMOVED FROM WALL, STUB A 1" CONDUIT UP INTO THE ACCESSIBLE CEILING SPACE AND CONNECT TO NEW PANEL BOX. INSTALL PULL STRING.

# PANEL "A" SCHEDULE

MANUFACTURER, CAT. NO: GE NHB

PANELBOARD CHARACTERISTICS:  
 VOLTS: 277/480  
 PHASES: 3  
 WIRES: 4

LOCATION: MAIN OFFICE SUITE / E2.3  
 SOLID NEUTRAL  
 GROUND BAR  
 MINIMUM SHORT CIRCUIT RATING: 42,000 RMS SYM AMPS

TRACE ALL CIRCUITS  
 MAIN LUGS: 400 AMPERES  
 PHASE 1

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	LIGHTS: 100-106, 110-113					1	100	20	ETR	ETR	ETR	ETR
3	3	LIGHTS: 100, 126					1	100	20	ETR	ETR	ETR	ETR
5	5	LIGHTS: 148					1	100	20	ETR	ETR	ETR	ETR
7	7	LIGHTS: 127, 146, 147					1	100	20	ETR	ETR	ETR	ETR
9	9	LIGHTS: 129					1	100	20	ETR	ETR	ETR	ETR
11	11	LIGHTS: 116					1	100	20	ETR	ETR	ETR	ETR
13	13	LIGHTS: 116					1	100	20	ETR	ETR	ETR	ETR
15	15	LIGHTS: 116					1	100	20	ETR	ETR	ETR	ETR
17	17	LIGHTS: 123					1	100	20	ETR	ETR	ETR	ETR
19													
21	21	A.C.#6					3	100	20	ETR	ETR	ETR	ETR
23													
25													
27	27	KITCHEN HOOD #2					3	100	90	ETR	ETR	ETR	ETR
29													
31													
33	33	KITCHEN HOOD #1					3	100	70	ETR	ETR	ETR	ETR
35													
37	37	SPARE?					1	100	20	ETR	ETR	ETR	ETR
39	39	SPARE?					1	100	20	ETR	ETR	ETR	ETR
41	41	SPARE?					1	100	20	ETR	ETR	ETR	ETR
43		SPACE AND BUS ONLY					1	100					
45													
47													
2	2	LIGHTS: 107, 111					1	100	20	ETR	ETR	ETR	ETR
4	4	LIGHTS: 149					1	100	20	ETR	ETR	ETR	ETR
6	6	LIGHTS: 149					1	100	20	ETR	ETR	ETR	ETR
8	8	LIGHTS: 150					1	100	20	ETR	ETR	ETR	ETR
10	10	LIGHTS: 141					1	100	20	ETR	ETR	ETR	ETR
12													
14	14	A.C.#8					3	100	20	ETR	ETR	ETR	ETR
16													
18		SPACE AND BUS ONLY					1	100					
20													
22	22	A.C.#7					3	100	20	ETR	ETR	ETR	ETR
24													
26													
28	28	KITCHEN HOOD #3					3	100	60	ETR	ETR	ETR	ETR
30													
32													
34	34	KITCHEN HOOD #2					3	100	90	ETR	ETR	ETR	ETR
36													
38	38	LIGHTS: 138					1	100	20	ETR	ETR	ETR	ETR
40	40	LIGHTS: 130					1	100	20	ETR	ETR	ETR	ETR
42	42	LIGHTS: 130					1	100	20	ETR	ETR	ETR	ETR
44													
46	46	FUTURE TRANSFORMER					3	100	45*				NOTE 2
48													
TOTALS													

\*=> HANDLE-LOCKING DEVICE

# PANEL "U" SCHEDULE

MANUFACTURER, CAT. NO: GE NLAB

PANELBOARD CHARACTERISTICS:  
 VOLTS: 120/208  
 PHASES: 3  
 WIRES: 4

LOCATION: MASONRY 218 / E2.1  
 SOLID NEUTRAL  
 GROUND BAR  
 MINIMUM SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

TRACE ALL CIRCUITS  
 MAIN LUGS: 100 AMPERES  
 PHASE 1

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	PORTABLE MIXER					2	100	20	ETR	ETR	ETR	ETR
3													
5	5	SAW (OUTSIDE)					2	100	30	ETR	ETR	ETR	ETR
7													
9	9	SPARE?					1	100	20	ETR	ETR	ETR	ETR
11	11	SPARE?					1	100	20	ETR	ETR	ETR	ETR
13	13	SPARE?					1	100	20	ETR	ETR	ETR	ETR
15	15	SPARE?					2	100	30	ETR	ETR	ETR	ETR
17	17	SPARE?											
19	19	SPARE?					2	100	30	ETR	ETR	ETR	ETR
21													
23		SPACE AND BUS ONLY					1	100					
2	2	SAW					2	100	30	ETR	ETR	ETR	ETR
4													
6	6	SPARE					1	100	20	ETR	ETR	ETR	ETR
8	8	CLOCK 197-196, REC: 196, 196, 199					1	100	20	ETR	ETR	ETR	ETR
10	10	SPARE					1	100	20	ETR	ETR	ETR	ETR
12	12	REC ROOM 197					1	100	20	ETR	ETR	ETR	ETR
14	14	SPARE					1	100	20	ETR	ETR	ETR	ETR
16	16	SPARE					2	100	60	ETR	ETR	ETR	ETR
18													
20	20	SPARE?					2	100	60	ETR	ETR	ETR	ETR
22													
24	24	SPACE AND BUS ONLY					1	100					
TOTALS													

REVISIONS:  
 1. 2021-10-12  
 PANEL "A"



**MASTER**  
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 CHARLOTTESVILLE, VA 22903

PANEL SCHEDULES -  
 PHASE 1 (SHEET 1 OF 3)

DATE ISSUED: 09/09/21

SCALE: NONE

JOB. NO. 653-014

DESIGNED: JHR

DRAWN: JHR

CHECKED: MGB

APPROVED: MGB

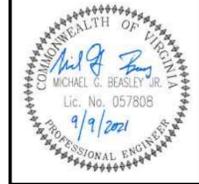
DRAWING NO.

E3.1

SHEET 7 OF 14

REVISION

REVISIONS:  
1. 2021-10-12  
PANEL "A"



CATEC  
 ELECTRICAL EQUIPMENT  
 REPLACEMENT PROJECT  
 CHARLOTTESVILLE, VA 22903

PANEL SCHEDULES -  
 PHASE 1 (SHEET 2 OF 3)

DATE ISSUED: 09/09/21  
 SCALE: NONE  
 JOB. NO. 653-014  
 DESIGNED: MGB  
 DRAWN: MGB  
 CHECKED: MGB  
 APPROVED: MGB

DRAWING NO.  
**E3.2**  
 SHEET 8 OF 14  
 REVISION

### PANEL "K" SCHEDULE

MANUFACTURER, CAT. NO. GE NLAB

**PANELBOARD CHARACTERISTICS:** LOCATION: AUTO TECHNOLOGY 223/E2.2 TRACE ALL CIRCUITS  
 VOLTS: 120/208 SOLID NEUTRAL MAIN BREAKER: 150 AMPS; SHUNT TRIP  
 PHASES: 3 GROUND BAR PHASE 1  
 WIRES: 4 MINIMUM SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE	
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC		
1	1	ROTARY LIFT @ DOOR 19					2	100	20	ETR	ETR	ETR	ETR	
3														
5	5	ROTARY LIFT @ DOOR 19					2	100	20	ETR	ETR	ETR	ETR	
7														
9	9	REC. 165					1	100	20	ETR	ETR	ETR	ETR	
11	11	GRINDER					1	100	20	ETR	ETR	ETR	ETR	
13	13	SPARE?					1	100	20	ETR	ETR	ETR	ETR	
15														
17	17	DRILL PRESS					3	100	20	ETR	ETR	ETR	ETR	
19														
21	21	JUNCTION BOX ON BAR JOIST					2	100	20	ETR	ETR	ETR	ETR	
23														
25	25	ALTERNATING SERVICE CENTER					2	100	20	ETR	ETR	ETR	ETR	
27														
29														
31	31	SPARE?					3	100	20	ETR	ETR	ETR	ETR	
33														
35	35	SPARE?					2	100	20	ETR	ETR	ETR	ETR	
37														
39	39	SPARE?					1	100	20	ETR	ETR	ETR	ETR	
41	41	SPARE?					1	100	20	ETR	ETR	ETR	ETR	
2	2	DRILL PRESS					1	100	20	ETR	ETR	ETR	ETR	
4	4	REC. 165					1	100	20	ETR	ETR	ETR	ETR	
6	6	REC. WORK BENCH					1	100	20	ETR	ETR	ETR	ETR	
8	8	DROP CORD REELS					1	100	20	ETR	ETR	ETR	ETR	
10	10	DYNAMOMETER					1	100	20	ETR	ETR	ETR	ETR	
12	12	REC. WORK BENCH					1	100	20	ETR	ETR	ETR	ETR	
14	14	VALVE GRINDER					1	100	20	ETR	ETR	ETR	ETR	
16	16	REC. WORK BENCH					1	100	20	ETR	ETR	ETR	ETR	
18	18	DOOR OPENER					1	100	20	ETR	ETR	ETR	ETR	
20	20	REC. 165					1	100	20	ETR	ETR	ETR	ETR	
22	22	WELDER					2	100	70	ETR	ETR	ETR	ETR	
24														
26	26	DOOR OPENER					1	100	20	ETR	ETR	ETR	ETR	
28	28	DRUM LATHE					1	100	20	ETR	ETR	ETR	ETR	
30	30	REC. 165					1	100	20	ETR	ETR	ETR	ETR	
32	32	REC. 168-170, CLOCK 172 & 165					1	100	20	ETR	ETR	ETR	ETR	
34	34	REC. WORK BENCH					1	100	20	ETR	ETR	ETR	ETR	
36	36	WHEEL ALIGNMENT					1	100	20	ETR	ETR	ETR	ETR	
38	38	SPARE?					1	100	20	ETR	ETR	ETR	ETR	
40	40	SPARE?					1	100	20	ETR	ETR	ETR	ETR	
42	42	SPARE?					1	100	20	ETR	ETR	ETR	ETR	
TOTALS														

### PANEL "V" SCHEDULE

MANUFACTURER, CAT. NO. GE NHB

**PANELBOARD CHARACTERISTICS:** LOCATION: CARPENTRY 217/E2.1 TRACE ALL CIRCUITS  
 VOLTS: 277/480 SOLID NEUTRAL MAIN BREAKER: 70 AMPERES; SHUNT TRIP  
 PHASES: 3 GROUND BAR PHASE 1  
 WIRES: 4 MINIMUM SHORT CIRCUIT RATING: 22,000 RMS SYM AMPS

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE	
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC		
1		SPACE & BUS ONLY					1	100						
3		*												
5		*												
7		*												
9		*												
11														
13	13	??					3	100	70	ETR	ETR	ETR	ETR	
15														
17		SPACE & BUS ONLY					1	100						
19		*												
21		*												
23		*												
25		*												
27		*												
29		*												
31		*												
33		*												
35		*												
2		SPACE & BUS ONLY					1	100						
4		*												
6		*												
8		*												
10		*												
12		*												
14	14						1	100	20	ETR	ETR	ETR	ETR	
16	16						1	100	20	ETR	ETR	ETR	ETR	
18	18						1	100	20	ETR	ETR	ETR	ETR	
20	20						1	100	20	ETR	ETR	ETR	ETR	
22	22						1	100	20	ETR	ETR	ETR	ETR	
24		SPACE & BUS ONLY					1	100						
26		*												
28		*												
30		*												
32		*												
34		*												
36		*												
TOTALS														

### PANEL "N" SCHEDULE

MANUFACTURER, CAT. NO. GE NHB

**PANELBOARD CHARACTERISTICS:** LOCATION: AUTO BODY 222/E2.2 TRACE ALL CIRCUITS  
 VOLTS: 277/480 SOLID NEUTRAL MAIN BREAKER: 200 AMPERES; SHUNT TRIP  
 PHASES: 3 GROUND BAR PHASE 1  
 WIRES: 4 MINIMUM SHORT CIRCUIT RATING: 42,000 RMS SYM AMPS

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE	
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC		
1		SPACE AND BUS ONLY												
3		*												
5		*												
7	7	PANEL "L" VIA TRANSFORMER					3	100	30	ETR	ETR	ETR	ETR	
9														
11														
13	13	SPARE?					3	100	100	ETR	ETR	ETR	ETR	
15														
17														
19	19	SPARE?					3	100	100	ETR	ETR	ETR	ETR	
21														
23														
25	25	SPARE?					3	100	100	ETR	ETR	ETR	ETR	
27														
29														
31	31	SPARE?					3	100	100	ETR	ETR	ETR	ETR	
33														
35		SPACE AND BUS ONLY					1	100						
2		SPACE AND BUS ONLY					1	100						
4		*												
6		*												
8	8	COMPRESSOR					3	100	20	ETR	ETR	ETR	ETR	
10														
12	12	SPARE?					1	100	20	ETR	ETR	ETR	ETR	
14	14	SPARE?					1	100	20	ETR	ETR	ETR	ETR	
16	16	SPARE?					1	100	20	ETR	ETR	ETR	ETR	
18	18	SPARE?					1	100	20	ETR	ETR	ETR	ETR	
20		SPACE AND BUS ONLY					1	100	20	ETR	ETR	ETR	ETR	
22														
24	24	SPARE?					3	100	40	ETR	ETR	ETR	ETR	
26														
28		SPACE & BUS ONLY												
30		*												
32		*												
34		*												
36		*												
38		*												
40		*												
42		*												
TOTALS														

### PANEL "BB" SCHEDULE

MANUFACTURER, CAT. NO. ??

**PANELBOARD CHARACTERISTICS:** LOCATION: WEST CORRIDOR/E2.1 TRACE ALL CIRCUITS  
 VOLTS: 120/208 SOLID NEUTRAL MAIN LUGS: 225 AMPERES  
 PHASES: 3 GROUND BAR PHASE 1  
 WIRES: 4 MINIMUM SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	REC. 158					1	100	20	ETR	ETR	ETR	ETR
3	3	REC. 213					1	100	20	ETR	ETR	ETR	ETR
5	5	REC. 204, 206, 207					1	100	20	ETR	ETR	ETR	ETR
7	7	W.U.V. #1					1	100	20	ETR	ETR	ETR	ETR
9	9	REC. 188, 192, 193					1	100	20	ETR	ETR	ETR	ETR
11	11	REC. 181-184					1	100	20	ETR	ETR	ETR	ETR
13	13	REC. 188					1	100	20	ETR	ETR	ETR	ETR
15	15	REC. AT LAB SHELVES					1	100	20	ETR	ETR	ETR	ETR
17	17	REC. 204					1	100	20	ETR	ETR	ETR	ETR
19	19	REC. 158, 187-CLOCK, 187					1	100	20	ETR	ETR	ETR	ETR
21	21	SPARE?					1	100	20	ETR	ETR	ETR	ETR
23	23	P.F. #1 & 2					1	100	20	ETR	ETR	ETR	ETR
25	25	W.F.C. #1, W.C.H. #3					1	100	20	ETR	ETR	ETR	ETR
27	27	COMPUTERS AT LAB					1	100	20	ETR	ETR	ETR	ETR
29	29	COMPUTERS AT LAB					1	100	20	ETR	ETR	ETR	ETR

# PANEL "W" SCHEDULE

MANUFACTURER, CAT. NO: GENLAB

**PANELBOARD CHARACTERISTICS:**

VOLTS: 120/208  
 PHASES: 3  
 WRES: 4

LOCATION: CARPENTRY 217/E2.1

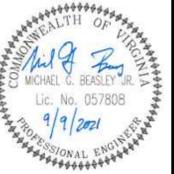
SOLID NEUTRAL  
 GROUND BAR

MINIMUM SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

MAIN LUGS: 225 AMPERES  
 PHASE 1

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT	EGC	
1	1	REC. RIGHT OF DRILL PRESS					1	100	20	ETR	ETR	ETR	ETR
3	3	REC. LEFT OF DRILL PRESS					1	100	20	ETR	ETR	ETR	ETR
5	5	REC. NEXT TO STORAGE ROOM#1					1	100	20	ETR	ETR	ETR	ETR
9	7	TABLE SAW					3	100	20	ETR	ETR	ETR	ETR
9	9		ETR	ETR	ETR	ETR							
11	11		ETR	ETR	ETR	ETR							
15	13	BLANK SAW NO CONNECTION					3	100	20	ETR	ETR	ETR	ETR
15	15		ETR	ETR	ETR	ETR							
17	17		ETR	ETR	ETR	ETR							
21	19	SPARE?					3	100	20	ETR	ETR	ETR	ETR
21	21		ETR	ETR	ETR	ETR							
23	23		ETR	ETR	ETR	ETR							
27	25	SPARE?					3	100	30	ETR	ETR	ETR	ETR
27	27		ETR	ETR	ETR	ETR							
29	29		ETR	ETR	ETR	ETR							
33	31	SPARE?					3	100	30	ETR	ETR	ETR	ETR
33	33		ETR	ETR	ETR	ETR							
35	35		ETR	ETR	ETR	ETR							
39	37	SPARE?					3	100	20	ETR	ETR	ETR	ETR
39	39		ETR	ETR	ETR	ETR							
41	41		ETR	ETR	ETR	ETR							
43	43	SPACE & BUS ONLY					1	100					
2	2	REC. LEFT OF WINDOWS					1	100	20	ETR	ETR	ETR	ETR
4	4	REC. NEXT TO MASONRY DOOR					1	100	20	ETR	ETR	ETR	ETR
6	6	REC. NEXT TO PANELBOARD					1	100	20	ETR	ETR	ETR	ETR
10	8	SPARE?					3	100	20	ETR	ETR	ETR	ETR
10	10		ETR	ETR	ETR	ETR							
12	12		ETR	ETR	ETR	ETR							
14	14	REC. NEXT TO JOINTER					1	100	20	ETR	ETR	ETR	ETR
16	16	GARAGE DOOR					1	100	20	ETR	ETR	ETR	ETR
18	18	TABLE SAW					1	100	20	ETR	ETR	ETR	ETR
22	20	DUST COLLECTOR					3	100	20	ETR	ETR	ETR	ETR
22	22		ETR	ETR	ETR	ETR							
24	24		ETR	ETR	ETR	ETR							
28	26	SPARE?					3	100	20	ETR	ETR	ETR	ETR
28	28		ETR	ETR	ETR	ETR							
30	30		ETR	ETR	ETR	ETR							
32	32	SPARE?					1	100	20	ETR	ETR	ETR	ETR
36	34	SPARE?					3	100	50	ETR	ETR	ETR	ETR
36	36		ETR	ETR	ETR	ETR							
38	38		ETR	ETR	ETR	ETR							
42	40	SPARE?					3	100	20	ETR	ETR	ETR	ETR
42	42		ETR	ETR	ETR	ETR							
44	44		ETR	ETR	ETR	ETR							
		TOTALS											

REVISIONS:  
 1. 2021-10-12  
 PANEL "A"



**MASTER**  
 ENGINEERS & DESIGNERS  
 904 Lakeside Drive, Lynchburg, VA 24501  
 434-846-1350 Fax: 434-846-1351



CATEC  
 ELECTRICAL EQUIPMENT  
 REPLACEMENT PROJECT  
 CHARLOTTSVILLE, VA 22903

PANEL SCHEDULES -  
 PHASE 1 (SHEET 3 OF 3)

DATE ISSUED: 09/09/21  
 SCALE: NONE  
 JOB. NO. 653-014  
 DESIGNED: MGB  
 DRAWN: MGB  
 CHECKED: MGB  
 APPROVED: MGB

DRAWING NO.  
 E3.3  
 SHEET 9 OF 14  
 REVISION

# MOTOR CONTROL CENTER SCHEDULE

MOTOR CONTROL CENTER CHARACTERISTICS:

VOLTS: 277/480  
PHASES: 3  
WIRES: 4  
SOLID GROUND

LOCATION: MECHANICAL E209 / E2.4

MAIN LUGS: 225 AMPERES

MINIMUM SHORT CIRCUIT RATING: 42,000 RMS SYM AMPS

PHASE 2

SPACE CKT. NO.	DESCRIPTION	LOAD HP	LOAD KVA	CONNECTED AMPERES			STARTER NEMA SIZE	TYPE	CIRCUIT BREAKER			BRANCH CIRCUIT CONDUCTORS			CONDUIT SIZE
				A	B	C			P	AF	AT	PHASE	NEUT.	EGC	
1	BASIN HEATER		6.0	7.2	7.2		N/A	N/A	3	100	20	ETR	ETR	ETR	ETR
2	COOLING TOWER	5.0	6.0	7.3		7.3	1	FVNR COMBO	3	100	20	ETR	ETR	ETR	ETR
3	PUMP P-2	7.5	8.8	10.5		10.5	1	FVNR COMBO	3	100	30	ETR	ETR	ETR	ETR
4	PUMP P-3	7.5	8.8	10.5		10.5	1	FVNR COMBO	3	100	30	ETR	ETR	ETR	ETR
5	PUMP P-4	7.5	8.8	10.5		10.5	1	FVNR COMBO	3	100	30	ETR	ETR	ETR	ETR
6	DWH RECIRC PUMP	1.5	2.4	2.9		2.9	1	FVNR COMBO	3	100	20	ETR	ETR	ETR	ETR
7	AC-5	2.0	2.7	3.3		3.3	1	FVNR COMBO	3	100	20	ETR	ETR	ETR	ETR
8	SPARE						1	FVNR COMBO	3	100	20				
9	SPARE						1	FVNR COMBO	3	100	30				
10	SPARE						1	FVNR COMBO	3	100	30				
TOTALS			43.4	52.3	52.3	52.3									

# PANEL "EM" SCHEDULE

MANUFACTURER, CAT. NO. GE NHB

PANELBOARD CHARACTERISTICS:

VOLTS: 277/480  
PHASES: 3  
WIRES: 4

LOCATION: MECH 209 / E2.4

SOLID NEUTRAL

GROUND BAR

MINIMUM SHORT CIRCUIT RATING: 22,000 RMS SYM AMPS

MAIN BREAKER: 100 AMPERES

PHASE 2

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	LIGHTS: EMERGENCY PART "A"					1	100	20	ETR	ETR	ETR	ETR
3	3	LIGHTS: EMERGENCY PART "B"					1	100	20	ETR	ETR	ETR	ETR
5	5	LIGHTS: 173					1	100	20	ETR	ETR	ETR	ETR
7	7	LIGHTS: 204					1	100	20	ETR	ETR	ETR	ETR
9	9	LIGHTS: 188					1	100	20	ETR	ETR	ETR	ETR
11	11	SPARE?					1	100	20	ETR	ETR	ETR	ETR
13	13	FIRE ALARM CONTACT					2	100	20	ETR	ETR	ETR	ETR
	15												
2	2	LIGHTS: BOILER ROOM					1	100	20	ETR	ETR	ETR	ETR
4	4	LIGHTS: 165					1	100	20	ETR	ETR	ETR	ETR
6	6	LIGHTS: EXITS - 165, 173, 188, 192, 204					1	100	20	ETR	ETR	ETR	ETR
8	8	LIGHTS: 197					1	100	20	ETR	ETR	ETR	ETR
10	10	SPARE?					1	100	20	ETR	ETR	ETR	ETR
12	12	SPARE?					1	100	20	ETR	ETR	ETR	ETR
14	14	LIGHTS: EMERGENCY PARTS "B" & "C"					1	100	20	ETR	ETR	ETR	ETR
16	16	SPARE?					1	100	20	ETR	ETR	ETR	ETR
TOTALS													

# PANEL "R" SCHEDULE

MANUFACTURER, CAT. NO. GE NHB

PANELBOARD CHARACTERISTICS:

VOLTS: 277/480  
PHASES: 3  
WIRES: 4

LOCATION: AUTO BODY 220 / E2.1

SOLID NEUTRAL

GROUND BAR

MINIMUM SHORT CIRCUIT RATING: 42,000 RMS SYM AMPS

TRACE ALL CIRCUITS

MAIN LUGS: 400 AMPERES

PHASE 2

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
3	1	DRILL PRESS					3	100	20	ETR	ETR	ETR	ETR
	3												
	5												
9	7	MILLING MACHINE					3	100	15	ETR	ETR	ETR	ETR
	9												
	11												
15	13	METAL LATHE					3	100	20	ETR	ETR	ETR	ETR
	15												
	17												
21	19	METAL LATHE					3	100	20	ETR	ETR	ETR	ETR
	21												
	23												
4	2	METAL LATHE					3	100	30	ETR	ETR	ETR	ETR
	4												
	6												
10	8	BAND SAW					3	100	30	ETR	ETR	ETR	ETR
	10												
	12												
16	14	PANEL "R2"					3	100	100	ETR	ETR	ETR	ETR
	16												
	18												
22	20	WELDER PLUG					3	100	50	ETR	ETR	ETR	ETR
	22												
	24												
SUB FEED BREAKER	SUB	PANEL "T" VIA TRANSFORMER					3	225	225	ETR	ETR	ETR	ETR
	SUB												
TOTALS													

# PANEL "R2" SCHEDULE

MANUFACTURER, CAT. NO. GE NHB

PANELBOARD CHARACTERISTICS:

VOLTS: 277/480  
PHASES: 3  
WIRES: 4

LOCATION: AUTO BODY 220 / E2.1

SOLID NEUTRAL

GROUND BAR

MINIMUM SHORT CIRCUIT RATING: 22,000 RMS SYM AMPS

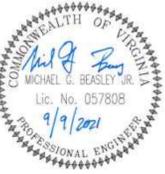
TRACE ALL CIRCUITS

MAIN LUGS: 100 AMPERES

PHASE 2

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	SPACE AND BUS ONLY					1	100					
3	3	LATHE 1					1	100	20	ETR	ETR	ETR	ETR
5	5	LATHE 3					1	100	20	ETR	ETR	ETR	ETR
9	7	SMOKE-EATER					3	100	20	ETR	ETR	ETR	ETR
	9												
	11												
15	13	SPARE?					3	100	15	ETR	ETR	ETR	ETR
	15												
	17												
	19	SPACE AND BUS ONLY					1	100					
4	2	LATHE 2					3	100	15	ETR	ETR	ETR	ETR
	4												
	6												
10	8	TIG WELDER PLUG					3	100	60	ETR	ETR	ETR	ETR
	10												
	12												
16	14	WELDER PLUG					3	100	50	ETR	ETR	ETR	ETR
	16												
	18												
20	20	SPACE AND BUS ONLY					1	100					
TOTALS													

REVISIONS:  
1. 2021-10-12  
PANEL "A"



**MASTER**  
ENGINEERS & DESIGNERS  
904 Lakeside Drive, Lynchburg, VA 24501  
434-846-1350 Fax: 434-846-1351



CATEC  
ELECTRICAL EQUIPMENT  
REPLACEMENT PROJECT  
CHARLOTTESVILLE, VA 22903

PANEL SCHEDULES -  
PHASE 2 (SHEET 1 OF 2)

DATE ISSUED: 09/09/21  
SCALE: NONE  
JOB. NO. 653-014  
DESIGNED: MGB  
DRAWN: MGB  
CHECKED: MGB  
APPROVED: MGB

DRAWING NO.  
E3.4  
SHEET 10 OF 14  
REVISION

### PANEL "T1" SCHEDULE

MANUFACTURER, CAT. NO. GE NLAB

**PANELBOARD CHARACTERISTICS:**

VOLTS: 120/208  
PHASES: 3  
WRES: 4

LOCATION: AUTO BODY 220 / E2.1  
SOLID NEUTRAL  
GROUND BAR  
MINIMUM SHORT CIRCUIT RATING: 22,000 RMS SYM AMPS

TRACE ALL CIRCUITS  
MAIN LUGS: 600 AMPERES  
PHASE 2

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	REC. ??					1	100	20	ETR	ETR	ETR	ETR
3	3	WELDING BOOTH					1	100	20	ETR	ETR	ETR	ETR
	5	SPACE AND BUS ONLY					1	100					
	7									ETR			
9	9	NEW HEAT PUMP					3	100	35	ETR	ETR	ETR	ETR
	11									ETR			
13	13	NEW FURNACE					2	100	60	ETR	ETR	ETR	ETR
	15									ETR			
17	17	SPARE?					1	100	20	ETR	ETR	ETR	ETR
19	19	SPARE?					1	100	20	ETR	ETR	ETR	ETR
21	21	SPARE?					2	100	70	ETR	ETR	ETR	ETR
	23									ETR			
	25	SPACE AND BUS ONLY					1	100					
	27	*					*	*					
	29	*					*	*					
2	2	SPOT WELDER					2	100	90	ETR	ETR	ETR	ETR
	4									ETR			
6	6	SPARE?					1	100	20	ETR	ETR	ETR	ETR
	8	SPACE AND BUS ONLY					1	100					
10	10	SPARE?					1	100	20	ETR	ETR	ETR	ETR
	12	SPACE AND BUS ONLY					1	100					
	14	*					*	*					
	16	*					*	*					
	18									ETR			
20	20	POWER HACKSAW					3	100	70	ETR	ETR	ETR	ETR
	22									ETR			
24	24	SPARE?					1	100	20	ETR	ETR	ETR	ETR
	26	SPACE AND BUS ONLY					1	100					
	28	*					*	*					
	30	*					*	*					
		TOTALS											

### PANEL "T2" SCHEDULE

MANUFACTURER, CAT. NO. GE NLAB

**PANELBOARD CHARACTERISTICS:**

VOLTS: 120/208  
PHASES: 3  
WRES: 4

LOCATION: AUTO BODY 220 / E2.1  
SOLID NEUTRAL  
GROUND BAR  
MINIMUM SHORT CIRCUIT RATING: 22,000 RMS SYM AMPS

TRACE ALL CIRCUITS  
MAIN LUGS: 600 AMPERES  
PHASE 2

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	??					1	100					
3	3	??					1	100	20	ETR	ETR	ETR	ETR
5	5	??					1	100	20	ETR	ETR	ETR	ETR
	7									ETR			
9	9	??					3	100	20	ETR	ETR	ETR	ETR
	11									ETR			
	13									ETR			
15	15	??					3	100	20	ETR	ETR	ETR	ETR
	17									ETR			
19	19	SPARE?					1	100	20	ETR	ETR	ETR	ETR
21	21	SPARE?					1	100	20	ETR	ETR	ETR	ETR
23	23	SPARE?					1	100	20	ETR	ETR	ETR	ETR
25	25	SPARE?					1	100	20	ETR	ETR	ETR	ETR
27	27	SPARE?					1	100	20	ETR	ETR	ETR	ETR
29	29	SPARE?					1	100	20	ETR	ETR	ETR	ETR
31	31	SPARE?					1	100	20	ETR	ETR	ETR	ETR
33	33	SPARE?					1	100	20	ETR	ETR	ETR	ETR
35	35	SPARE?					1	100	20	ETR	ETR	ETR	ETR
	2									ETR			
4	4	??					3	100	20	ETR	ETR	ETR	ETR
	6									ETR			
	8									ETR			
10	10	??					3	100	20	ETR	ETR	ETR	ETR
	12									ETR			
	14									ETR			
16	16	??					3	100	20	ETR	ETR	ETR	ETR
	18									ETR			
20	20	??					2	100	20	ETR	ETR	ETR	ETR
	22									ETR			
	24	SPACE AND BUS ONLY					1	100					
	26	*					*	*					
	28	*					*	*					
	30	*					*	*					
	32	*					*	*					
34	34	SPARE?					1	100	20	ETR	ETR	ETR	ETR
36	36	SPARE?					1	100	20	ETR	ETR	ETR	ETR
		TOTALS											

REVISIONS:  
1. 2021-10-12  
PANEL "A"



CATEC  
ELECTRICAL EQUIPMENT  
REPLACEMENT PROJECT  
CHARLOTTESVILLE, VA 22903

PANEL SCHEDULES -  
PHASE 2 (SHEET 2 OF 2)

DATE ISSUED: 09/09/21  
SCALE: NONE  
JOB. NO. 653-014  
DESIGNED: MGB  
DRAWN: MGB  
CHECKED: MGB  
APPROVED: MGB

DRAWING NO. E3.4  
SHEET 11 OF 14  
REVISION

### PANEL "AA" SCHEDULE

MANUFACTURER, CAT. NO. GENHB

**PANELBOARD CHARACTERISTICS:**

VOLTS: 277/480  
PHASES: 3  
WIRES: 4

LOCATION: WEST CORRIDOR/E2.1

SOLID NEUTRAL  
GROUND BAR  
MINIMUM SHORT CIRCUIT RATING: 22,000 RMS SYM AMPS

MAIN LUGS: 225 AMPERES  
PHASE 3

OCT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
3	1	A.C.#1					3	100	20	ETR	ETR	ETR	ETR
	3									ETR	ETR	ETR	ETR
	5									ETR	ETR	ETR	ETR
	7									ETR	ETR	ETR	ETR
9	9	H.V.#11					3	100	20	ETR	ETR	ETR	ETR
	11									ETR	ETR	ETR	ETR
	13									ETR	ETR	ETR	ETR
15	15	WELDING EXHAUST SYSTEM #1					3	100	20	ETR	ETR	ETR	ETR
	17									ETR	ETR	ETR	ETR
	19									ETR	ETR	ETR	ETR
21	21	H.V.#10					3	100	20	ETR	ETR	ETR	ETR
	23									ETR	ETR	ETR	ETR
	25									ETR	ETR	ETR	ETR
27	27	R.F.#3 AND #4					3	100	20	ETR	ETR	ETR	ETR
	29									ETR	ETR	ETR	ETR
	31									ETR	ETR	ETR	ETR
33	33	A.C.#2					3	100	20	ETR	ETR	ETR	ETR
	35									ETR	ETR	ETR	ETR
37	37	SPARE?					1	100	20	ETR	ETR	ETR	ETR
39	39	SPARE?					1	100	20	ETR	ETR	ETR	ETR
41	41	SPARE?					1	100	20	ETR	ETR	ETR	ETR
	2									ETR	ETR	ETR	ETR
4	4	H.V.#12					3	100	20	ETR	ETR	ETR	ETR
	6									ETR	ETR	ETR	ETR
	8									ETR	ETR	ETR	ETR
10	10	R.F.#7 & 8					3	100	20	ETR	ETR	ETR	ETR
	12									ETR	ETR	ETR	ETR
	14									ETR	ETR	ETR	ETR
16	16	R.F.#5 & 6					3	100	20	ETR	ETR	ETR	ETR
	18									ETR	ETR	ETR	ETR
	20									ETR	ETR	ETR	ETR
22	22	H.V.#9					3	100	20	ETR	ETR	ETR	ETR
	24									ETR	ETR	ETR	ETR
	26									ETR	ETR	ETR	ETR
28	28	DUST COLLECTOR 188					3	100	30	ETR	ETR	ETR	ETR
	30									ETR	ETR	ETR	ETR
32	32	SPARE?					1	100	20	ETR	ETR	ETR	ETR
34	34	SPARE?					1	100	20	ETR	ETR	ETR	ETR
36	36	SPARE?					1	100	20	ETR	ETR	ETR	ETR
38	38	SPARE?					1	100	20	ETR	ETR	ETR	ETR
40	40	SPARE?					1	100	20	ETR	ETR	ETR	ETR
42	42	SPARE?					1	100	20	ETR	ETR	ETR	ETR
		TOTALS											

### PANEL "B" SCHEDULE

MANUFACTURER, CAT. NO. GENHB

**PANELBOARD CHARACTERISTICS:**

VOLTS: 277/480  
PHASES: 3  
WIRES: 4

LOCATION: CULINARY ARTS 104/E2.3

SOLID NEUTRAL  
GROUND BAR  
MINIMUM SHORT CIRCUIT RATING: 42,000 RMS SYM AMPS

MAIN LUGS: 400 AMPERES  
PHASE 3

OCT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
3	1	FRYER DEEP FAT					3	100	30	ETR	ETR	ETR	ETR
	3									ETR	ETR	ETR	ETR
	5									ETR	ETR	ETR	ETR
	7									ETR	ETR	ETR	ETR
9	9	GRIDDLE					3	100	30	ETR	ETR	ETR	ETR
	11									ETR	ETR	ETR	ETR
	13									ETR	ETR	ETR	ETR
15	15	RANGE					3	100	40	ETR	ETR	ETR	ETR
	17									ETR	ETR	ETR	ETR
	19									ETR	ETR	ETR	ETR
21	21	DISHWASHER					3	100	40	ETR	ETR	ETR	ETR
	23									ETR	ETR	ETR	ETR
	25									ETR	ETR	ETR	ETR
27	27	2-DECK BAKING OVEN					3	100	35	ETR	ETR	ETR	ETR
	29									ETR	ETR	ETR	ETR
31	31	SPARE?					1	100	20	ETR	ETR	ETR	ETR
33	33	SPARE?					1	100	20	ETR	ETR	ETR	ETR
35	35	SPARE?					1	100	20	ETR	ETR	ETR	ETR
37	37	SPARE?					1	100	20	ETR	ETR	ETR	ETR
39	39	SPARE?					1	100	20	ETR	ETR	ETR	ETR
41	41	SPARE?					1	100	20	ETR	ETR	ETR	ETR
	2									ETR	ETR	ETR	ETR
4	4	PRESSURE COOKER					3	100	40	ETR	ETR	ETR	ETR
	6									ETR	ETR	ETR	ETR
	8									ETR	ETR	ETR	ETR
10	10	BROILER					3	100	30	ETR	ETR	ETR	ETR
	12									ETR	ETR	ETR	ETR
	14									ETR	ETR	ETR	ETR
16	16	BOOSTER HEATER					3	100	20	ETR	ETR	ETR	ETR
	18									ETR	ETR	ETR	ETR
	20									ETR	ETR	ETR	ETR
22	22	SPARE?					3	100	30	ETR	ETR	ETR	ETR
	24									ETR	ETR	ETR	ETR
	26									ETR	ETR	ETR	ETR
28	28	TRANSFORMER - PANELS C & D					3	100	100	ETR	ETR	ETR	ETR
	30									ETR	ETR	ETR	ETR
32	32	SPARE?					1	100	20	ETR	ETR	ETR	ETR
34	34	SPARE?					1	100	20	ETR	ETR	ETR	ETR
36	36	SPARE?					1	100	20	ETR	ETR	ETR	ETR
38	38	SPARE?					1	100	20	ETR	ETR	ETR	ETR
40	40	SPARE?					1	100	20	ETR	ETR	ETR	ETR
42	42	SPARE?					1	100	20	ETR	ETR	ETR	ETR
		TOTALS											

### PANEL "C" SCHEDULE

MANUFACTURER, CAT. NO. GENLAB

**PANELBOARD CHARACTERISTICS:**

VOLTS: 120/208  
PHASES: 3  
WIRES: 4

LOCATION: CULINARY ARTS 104/E2.3

SOLID NEUTRAL  
GROUND BAR  
MINIMUM SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

MAIN LUGS: 225 AMPERES  
PHASE 3

OCT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	SPARE?					1	100	20	ETR	ETR	ETR	ETR
3	3	MICROWAVE					1	100	20	ETR	ETR	ETR	ETR
5	5	RECEPTACLE					2	100	20	ETR	ETR	ETR	ETR
	7									ETR	ETR	ETR	ETR
9	9	R.F. 27 & 28					1	100	20	ETR	ETR	ETR	ETR
11	11	DISHWASHER					2	100	20	ETR	ETR	ETR	ETR
	13									ETR	ETR	ETR	ETR
15	15	SPARE?					1	100	20	ETR	ETR	ETR	ETR
17	17	IMMERSION BLENDER					2	100	40	ETR	ETR	ETR	ETR
	19									ETR	ETR	ETR	ETR
21	21	LIGHTS: OUTSIDE DOOR					1	100	20	ETR	ETR	ETR	ETR
23	23	LIGHTS: WALK-IN BOX					1	100	20	ETR	ETR	ETR	ETR
25	25	FIRE CONTROL EQUIPMENT					1	100	20	ETR	ETR	ETR	ETR
	27	SPACE AND BUS ONLY					1	100					
	29	*					*						
	31									ETR	ETR	ETR	ETR
33	33	CONVECTION OVEN					3	100	50	ETR	ETR	ETR	ETR
	35									ETR	ETR	ETR	ETR
	37									ETR	ETR	ETR	ETR
39	39	CONVECTION OVEN					3	100	50	ETR	ETR	ETR	ETR
	41									ETR	ETR	ETR	ETR
2	2	FREEZER					1	100	20	ETR	ETR	ETR	ETR
4	4	SPARE?					1	100	20	ETR	ETR	ETR	ETR
5	5	PIZZA OVEN					2	100	40	ETR	ETR	ETR	ETR
	8									ETR	ETR	ETR	ETR
10	10	SPARE?					1	100	20	ETR	ETR	ETR	ETR
12	12	WALK-IN BOX					2	100	20	ETR	ETR	ETR	ETR
	14									ETR	ETR	ETR	ETR
16	16	HOT FOOD WELLS					2	100	30	ETR	ETR	ETR	ETR
	18									ETR	ETR	ETR	ETR
20	20	SPARE?					1	100	20	ETR	ETR	ETR	ETR
22	22	REC. CASHIER STAND					1	100	20	ETR	ETR	ETR	ETR
24	24	HOOD LIGHTS IN #1, 2, 5					1	100	20	ETR	ETR	ETR	ETR
26	26	WATER HEATER FOR DW					1	100	20	ETR	ETR	ETR	ETR
28	28	SPARE?					1	100	20	ETR	ETR	ETR	ETR
30	30	R.F. #36					1	100	20	ETR	ETR	ETR	ETR
32	32	SPARE?					2	100	30	ETR	ETR	ETR	ETR
	34									ETR	ETR	ETR	ETR
	36	SPACE AND BUS ONLY					1	100					
	38	*					*						
	40	*					*						
	42	*					*						
		TOTALS											

### PANEL "P" SCHEDULE

MANUFACTURER, CAT. NO. GENHB

**PANELBOARD CHARACTERISTICS:**

VOLTS: 277/480  
PHASES: 3  
WIRES: 4

LOCATION: WEST CORRIDOR/E2.2

REVISIONS:  
1. 2021-10-12  
PANEL "A"

### PANEL "CC" SCHEDULE

MANUFACTURER, CAT. NO. GENLAB

PANELBOARD CHARACTERISTICS: LOCATION: MECH 209/E2.4  
VOLTS: 120/208V SOLID NEUTRAL MAIN LUGS: 225 AMPERES  
PHASES: 3 GROUND BAR PHASE 3  
WIRES: 4 MINIMUM SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

O.KT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	LIGHTS: OUTSIDE RM. 156					1	100	20	ETR	ETR	ETR	ETR
3	3	HARCO CONTROLS					1	100	20	ETR	ETR	ETR	ETR
5	5	REC. BOILER ROOM HEAT TAPE					1	100	20	ETR	ETR	ETR	ETR
7	7	BOILERS					2	100	50	ETR	ETR	ETR	ETR
9	9												
11	11	WATER TREATMENT PUMP					1	100	20	ETR	ETR	ETR	ETR
13	13	AIR DRYER - JOHNSON AIR COMP.					1	100	20	ETR	ETR	ETR	ETR
15	15	TELEPHONE SYSTEM					1	100	20	ETR	ETR	ETR	ETR
17	17	GIRLS/GUYS BOTH EMRRG LIGHTS					1	100	20	ETR	ETR	ETR	ETR
19	19	RELIEF VENT FOR BOILER RM					1	100	20	ETR	ETR	ETR	ETR
21	21	DRYER #2					2	100	20	ETR	ETR	ETR	ETR
23	23												
2	2	REC. BOILER ROOM					1	100	20	ETR	ETR	ETR	ETR
4	4	HW CIRCULATING PUMP					1	100	20	ETR	ETR	ETR	ETR
6	6	TELEPHONE EQUIP					1	100	20	ETR	ETR	ETR	ETR
8	8	REC. BOILER ROOM					1	100	20	ETR	ETR	ETR	ETR
10	10	TIME CLOCK OUTSIDE LIGHTS					1	100	20	ETR	ETR	ETR	ETR
12	12	SPARE?					1	100	20	ETR	ETR	ETR	ETR
14	14	TEMPERATURE CONTROL PANEL					1	100	20	ETR	ETR	ETR	ETR
16	16	EX FAN REFRIGERATION MONITOR					1	100	20	ETR	ETR	ETR	ETR
18	18	HALO GUARD ALARM PANEL					1	100	20	ETR	ETR	ETR	ETR
20	20	WASHER #1					1	100	20	ETR	ETR	ETR	ETR
22	22	HOT WATER					1	100	20	ETR	ETR	ETR	ETR
24	24	120V WAN					1	100	20	ETR	ETR	ETR	ETR
		TOTALS											

### PANEL "D" SCHEDULE

MANUFACTURER, CAT. NO. GENLAB

PANELBOARD CHARACTERISTICS: LOCATION: CULINARY ARTS 104/E2.3  
VOLTS: 120/208 SOLID NEUTRAL TRACE ALL CIRCUITS MAIN LUGS: 225 AMPERES  
PHASES: 3 GROUND BAR PHASE 3  
WIRES: 4 MINIMUM SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

O.KT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	REACH IN REFRIG					1	100	20	ETR	ETR	ETR	ETR
3	3	REC. UNDER SINK COFFEE					1	100	20	ETR	ETR	ETR	ETR
5	5	REC. KITCHEN UTILITY					1	100	20	ETR	ETR	ETR	ETR
7	7	REC. MIXER					1	100	20	ETR	ETR	ETR	ETR
9	9	REC. REFRIG					1	100	20	ETR	ETR	ETR	ETR
11	11	REC. UNDER COFFEE STAND					2	100	20	ETR	ETR	ETR	ETR
13	13												
15	15	STEAM KETTLE FLOOR SPARE					1	100	20	ETR	ETR	ETR	ETR
17	17	SPARE?					1	100	20	ETR	ETR	ETR	ETR
19	19	REC. SOUTH WALL					1	100	20	ETR	ETR	ETR	ETR
21	21	REC. SOUTH FLOOR					1	100	20	ETR	ETR	ETR	ETR
23	23	SPARE?					1	100	20	ETR	ETR	ETR	ETR
25	25	REC. SOUTH WALL					2	100	20	ETR	ETR	ETR	ETR
27	27												
29	29	SPACE AND BUS ONLY					1	100					
2	2	PVC FREEZER					1	100	20	ETR	ETR	ETR	ETR
4	4	HEAT AC W/V #14 & 15					1	100	20	ETR	ETR	ETR	ETR
6	6	REC. BEHIND OVEN					2	100	40	ETR	ETR	ETR	ETR
8	8												
10	10	TV. SHED					1	100	20	ETR	ETR	ETR	ETR
12	12	SPARE?					2	100	40	ETR	ETR	ETR	ETR
14	14												
16	16	REC. UNDER WASH SINK					1	100	20	ETR	ETR	ETR	ETR
18	18	REC. SOUTH WALL					1	100	20	ETR	ETR	ETR	ETR
20	20	REC. ABOVE OVEN TOP					1	100	20	ETR	ETR	ETR	ETR
22	22	REC. TABLE MIXERS					1	100	20	ETR	ETR	ETR	ETR
24	24	REC. FLOOR KITCHEN					1	100	20	ETR	ETR	ETR	ETR
26	26	SPARE?					2	100	20	ETR	ETR	ETR	ETR
28	28												
30	30	SPARE?					1	100	20	ETR	ETR	ETR	ETR
		TOTALS											

### PANEL "DD" SCHEDULE

MANUFACTURER, CAT. NO. GENLAB

PANELBOARD CHARACTERISTICS: LOCATION: MECH 209/E2.4  
VOLTS: 277/480 SOLID NEUTRAL MAIN LUGS: 100 AMPERES  
PHASES: 3 GROUND BAR PHASE 3  
WIRES: 4 MINIMUM SHORT CIRCUIT RATING: 22,000 RMS SYM AMPS

O.KT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	LIGHTS: OUTSIDE PART "A"					1	100	20	ETR	ETR	ETR	ETR
3	3	SPARE?					1	100	20	ETR	ETR	ETR	ETR
5	5	LIGHTS: OUTSIDE PART "C"					1	100	20	ETR	ETR	ETR	ETR
7	7	LIGHTS: OUTSIDE PART "B" AND "C"					1	100	20	ETR	ETR	ETR	ETR
9	9	SPARE?					1	100	20	ETR	ETR	ETR	ETR
11	11	SPARE?					1	100	20	ETR	ETR	ETR	ETR
2	2	LIGHTS: OUTSIDE 158					1	100	20	ETR	ETR	ETR	ETR
4	4	LIGHTS: PARKING LOT					1	100	20	ETR	ETR	ETR	ETR
6	6	SPARE?					1	100	20	ETR	ETR	ETR	ETR
8	8	SPARE?					1	100	20	ETR	ETR	ETR	ETR
10	10	SPARE?					1	100	20	ETR	ETR	ETR	ETR
12	12	SPARE?					1	100	20	ETR	ETR	ETR	ETR
		TOTALS											

### PANEL "E" SCHEDULE

MANUFACTURER, CAT. NO. GENLAB

PANELBOARD CHARACTERISTICS: LOCATION: COSMETOLOGY/E2.3  
VOLTS: 120/208 SOLID NEUTRAL TRACE ALL CIRCUITS MAIN LUGS: 225 AMPERES  
PHASES: 3 GROUND BAR PHASE 3  
WIRES: 4 MINIMUM SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

O.KT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
3	1	SOLAR					3	100	15	ETR	ETR	ETR	E
	3												
	5												
7	7	REC. 132					1	100	20	ETR	ETR	ETR	E
9	9	SPARE?					1	100	20	ETR	ETR	ETR	E
11	11	REC. 116 AND 123					1	100	20	ETR	ETR	ETR	E
13	13	SPARE?					1	100	20	ETR	ETR	ETR	E
15	15	REC. 116 AND 123					1	100	20	ETR	ETR	ETR	E
17	17	R.F. #29					1	100	20	ETR	ETR	ETR	E
19	19	REC. 116, 121, 122					1	100	20	ETR	ETR	ETR	E
21	21	REC. DRYER					1	100	20	ETR	ETR	ETR	E
23	23	REC. DRYER					1	100	20	ETR	ETR	ETR	E
25	25	REC. DRYER					1	100	20	ETR	ETR	ETR	E
27	27	REC. DRYER					1	100	20	ETR	ETR	ETR	E
29	29	7 & 8 COSMO					1	100	20	ETR	ETR	ETR	E
31	31	LIGHTS: 130, 136					1	100	20	ETR	ETR	ETR	E
33	33	COSMO BOOTH					1	100	20	ETR	ETR	ETR	E
35	35	REC. WHITE					1	100	20	ETR	ETR	ETR	E
37	37	BOOTH 5 & 6					1	100	20	ETR	ETR	ETR	E
39	39	DRYER 132					1	100	20	ETR	ETR	ETR	E
41	41	SPARE?					1	100	20	ETR	ETR	ETR	E
2	2	REC. 130 AND 135					1	100	20	ETR	ETR	ETR	E
4	4	REC. KNEE WALL					1	100	20	ETR	ETR	ETR	E
6	6	REC. 134 AND CLOCK 141					1	100	20	ETR	ETR	ETR	E
8	8	WCH #6					1	100	20	ETR	ETR	ETR	E
10	10	REC. 130 AND 131					1	100	20	ETR	ETR	ETR	E
12	12	COSMO STATIONS					1	100	20	ETR	ETR	ETR	E
14	14	REC. DRYER					1	100	20	ETR	ETR	ETR	E
16	16	REC. 116					1	100	20	ETR	ETR	ETR	E
18	18	REC. 116, 121, 122					1	100	20	ETR	ETR	ETR	E
20	20	REC. 116					1	100	20	ETR	ETR	ETR	E
22	22	REC. DRYER					1	100	20	ETR	ETR	ETR	E
24	24	REC. DRYER					1	100	20	ETR	ETR	ETR	E
26	26	REC. DRYER					1	100	20	ETR	ETR	ETR	E
28	28	R.F. #30 AND 31					1	100	20	ETR	ETR	ETR	E
30	30	WUV 11 AND 12					1	100	20	ETR	ETR	ETR	E
32	32	R.F. #35					1	100	20	ETR	ETR	ETR	E
34	34	COSMO BOOTH 9					1	100	20	ETR	ETR	ETR	E
36	36	COSMO BOOTHS 1 & 2					1	100	20	ETR	ETR	ETR	E
38	38	REC. DRYER					1	100	20	ETR	ETR	ETR	E
40	40	WIG DRYER					1	100	20	ETR	ETR	ETR	E
42	42	SPARE?					1	100	20	ETR	ETR	ETR	E
		TOTALS											

### PANEL "F" SCHEDULE

MANUFACTURER, CAT. NO. GENLAB

PANELBOARD CHARACTERISTICS: LOCATION: NETWORKING LAB 107/E2.3  
VOLTS: 120/208 SOLID NEUTRAL TRACE ALL CIRCUITS MAIN LUGS: 225 AMPERES  
PHASES: 3 GROUND BAR PHASE 3  
WIRES: 4 MINIMUM SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

O.KT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	REC. FLOOR 149					1	100	20	ETR	ETR	ETR	ET
3	3	REC. FLOOR 149					1	100	20	ETR	ETR	ETR	ET
5	5	REC. FLOOR 149					1	100	20	ETR	ETR	ETR	ET
7	7	REC. 107-108	</										

