

ELECTRICAL SPECIFICATIONS

260573 - OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

- A. COMPUTER SOFTWARE DEVELOPERS. PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
 1. SKM SYSTEMS ANALYSIS, INC.
 2. ESA, INC.
 3. CGI CYME.
 4. EDSA MICRO CORPORATION.
 5. OPERATION TECHNOLOGY, INC.
- B. CALCULATE THE MAXIMUM AVAILABLE SHORT-CIRCUIT CURRENT IN AMPERES RMS SYMMETRICAL AT CIRCUIT BREAKER POSITIONS OF THE ELECTRICAL POWER DISTRIBUTION SYSTEM. THE CALCULATION SHALL BE FOR A CURRENT IMMEDIATELY AFTER INITIATION AND FOR A THREE-PHASE BOLTED SHORT CIRCUIT AT EACH OF THE FOLLOWING:
 1. SWITCHGEAR AND SWITCHBOARD BUS.
 2. BRANCH CIRCUIT PANELBOARD.
- C. CALCULATIONS TO VERIFY INTERRUPTING RATINGS OF OVERCURRENT PROTECTIVE DEVICES SHALL COMPLY WITH IEEE 141.
- D. PERFORM COORDINATION STUDY USING APPROVED COMPUTER SOFTWARE PROGRAM. PROVIDE A WRITTEN REPORT USING RESULTS OF FAULT-CURRENT STUDY. COMPLY WITH IEEE 399.
 1. CALCULATE THE MAXIMUM AND MINIMUM 1/2-CYCLE SHORT-CIRCUIT CURRENTS.
 2. CALCULATE THE MAXIMUM AND MINIMUM INTERRUPTING DUTY (5 CYCLES TO 2 SECONDS) SHORT-CIRCUIT CURRENTS.
 3. CALCULATE THE MAXIMUM AND MINIMUM GROUND-FAULT CURRENTS.
- E. COMPLY WITH IEEE 241 RECOMMENDATIONS FOR FAULT CURRENTS AND TIME INTERVALS.
- F. TRANSFORMER PRIMARY OVERCURRENT PROTECTIVE DEVICES:
 1. DEVICE SHALL NOT OPERATE IN RESPONSE TO THE FOLLOWING:
 - 1.a. INRUSH CURRENT WHEN FIRST ENERGIZED.
 - 1.b. SELF-COOLED, FULL-LOAD CURRENT OR FORCE-AIR-COOLED, FULL-LOAD CURRENT, WHICHEVER IS SPECIFIED FOR THAT TRANSFORMER.
 - 1.c. PERMISSIBLE TRANSFORMER OVERLOADS ACCORDING TO IEEE C57.96 IF REQUIRED BY UNUSUAL LOADING OR EMERGENCY CONDITIONS.
 2. DEVICE SETTINGS SHALL PROTECT TRANSFORMERS ACCORDING TO IEEE C57.12.00, FOR FAULT CURRENTS.
- G. CONDUCTOR PROTECTION: PROTECT CABLES AGAINST DAMAGE FROM FAULT CURRENTS ACCORDING TO ICEA P-32-382, ICEA P-45-482, AND CONDUCTOR MELTING CURVES IN IEEE 242.

260574 - ARC-FLASH HAZARD ANALYSIS STUDY

- A. THE CONTRACTOR SHALL FURNISH AN ARC FLASH HAZRD ANALYSIS STUDY PER THE REQUIREMENTS SET FORTH IN NFPA 70E - STANDARD FOR SAFETY IN THE WORKPLACE. THE ARC FLASH HAZARD ANALYSIS SHALL BE PERFORMED ACCORDING TO IEEE 1584 EQUATIONS THAT ARE PRESENTED IN NFPA70E-2004, ANNEX.
- B. THE FLASH PROTECTION BOUNDARY AND THE INCIDENT ENERGY SHALL BE CALCULATED AT ALL SIGNIFICANT LOCATIONS IN THE ELECTRICAL DISTRIBUTION SYSTEM (SWITCHBOARDS, PANELBOARDS, BUSWAY AND SPLITTERS) WHERE WORK COULD BE PERFORMED ON ENERGIZED PARTS.
- C. SAFE WORKING DISTANCES SHALL BE BASED UPON THE CALCULATED ARC FLASH BOUNDARY CONSIDERING AN INCIDENT ENERGY OF 1.2 CAL/CM².
- D. ARC FLASH CALCULATIONS SHALL BE BASED ON ACTUAL OVERCURRENT PROTECTIVE DEVICE CLEARING TIME. MAXIMUM CLEARING TIME WILL BE CAPPED AT 2 SECONDS BASED ON IEEE 1584-2002 SECTION B.1.2. WHERE IT IS NOT PHYSICALLY POSSIBLE TO MOVE OUTSIDE OF THE FLASH PROTECTION BOUNDARY IN LESS THAN 2 SECONDS DURING AN ARC FLASH EVENT A MAXIMUM CLEARING TIME BASED ON THE SPECIFIC LOCATION SHALL BE UTILIZED.
- E. CONTRACTOR SHALL PROVIDE A 3.5" (91mm) x 5" (129mm) THERMAL TRANSFER TYPE LABEL OF HIGH ADHESION POLYESTER FOR EACH WORK LOCATION ANALYZED.
- F. ALL LABELS WILL BE BASED ON RECOMMENDED OVERCURRENT SETTINGS AND WILL BE PROVIDED AFTER THE RESULTS OF THE ANALYSIS HAVE BEEN PRESENTED TO THE OWNER AND AFTER ANY SYSTEM CHANGES, UPGRADES, OR MODIFICATIONS HAVE BEEN INCORPORATED IN THE SYSTEM.
- G. THE LABEL SHALL INCLUDE THE FOLLOWING INFORMATION, AT A MINIMUM:
 1. LOCATION DESIGNATION.
 2. NOMINAL VOLTAGE.
 3. FLASH PROTECTION BOUNDARY.

- 4. HAZARD RISK CATEGORY.
 - 5. INCIDENT ENERGY.
 - 6. WORKING DISTANCE.
 - 7. ENGINEERING REPORT NUMBER , REVISION NUMBER AND ISSUE DATE.
- H. LABELS SHALL BE MACHINE PRINTED, WITH NO FIELD MARKINGS.
1. FOR EACH SWITCHBOARD AND PANELBOARD, ONE ARC FLASH LABEL SHALL BE PROVIDED.
- I. THE WORKPLACE ELECTRICAL SAFETY STANDARD SHALL BE FOLLOWED FOR THE ARC-FLASH CALCULATION, STUDIES AND ARC-FLASH LABELS AS THE MAIN STANDARD.

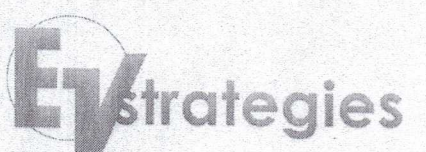
MAIN: 1200												VOLTAGE: 480/277												PHASE: 3			WIRE: 4		
MTS: FLOOR												AIC: 65,000												LOAD (KVA)			PHASE		
CKT #	FRAME	TRIP	POLE	DESCRIPTION	LTG	REC	MTR	A/C	HTG	DATA	KIT	MISC	A	B	C														
1	600	600	3	DELTA POWER UNIT 350KW									122.7	122.7	122.7														
2	250	175	3	DELTA DISPENSER 100KW									35.5	35.5	35.5														
3	250	175	3	DELTA DISPENSER 100KW									35.5	35.5	35.5														
4	100	20	3	SPARE																									
5	100	30	3	SPARE																									
6				SPACE																									
7				SPACE																									
8	100	30	3	TRANSFORMER & PANLE LP1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0											
CONNECTED LOAD (KVA):					582.6			PHASE A			574.9	159.2																	
DEMAND LOAD (KVA):					582.6			PHASE B			573.5	158.9																	
CONNECTED LOAD (AMPS):					700.8			PHASE C			571.0	158.2																	
DEMAND LOAD (AMPS):					700.8			AMPS			580.9																		
AMPACITY REQUIRED:					875.5																								

LIGHTING	0.00	KVA X 125 % =	0.0 KVA
RECEPTACLE TOTAL	1.77	KVA	
1ST	10.00	KVA X 100 % =	1.8 KVA
REMAIN	0.00	KVA X 50 % =	0.0 KVA
MOTORS TOTAL	0.00	KVA X 100 % =	0.0 KVA
LARGEST		KVA X 125 % =	0.0 KVA
REMAIN	0.00	KVA X 100 % =	0.0 KVA
A/C	0.00	KVA X 100 % =	0.0 KVA
HEATING	0.00	KVA X 100 % =	0.0 KVA
LOCKED-OUT LOAD		KVA X 100 % =	0.0 KVA
KITCHEN	0.00	KVA X 65 % =	0.0 KVA
DATA PROCESSING	0.00	KVA X 85 % =	0.0 KVA
MISCELLANEOUS (EV CHARGERS)	580.87	KVA X 125 % =	726.1 KVA
TOTAL			873.3 AMPS
			727.9 KVA
			875.5 AMPS

LP1		<input checked="" type="checkbox"/> NEW <input type="checkbox"/> EXISTING		PANELBOARD SCHEDULE																																								
CKT #	TYPE	TRIP / POLE	DESCRIPTION	BRANCH CKT	LOAD (KVA)	MAIN TYPE: THERMAL MAG												VOLTAGE: 208Y/120V			PHASE: 3			NEUTRAL: 100%			WIRE: 4			ENCLOSURE: NEMA 3R			MOUNTING: SURFACE			FEED THRU LUGS: NO			ISOLATED GND: NO			AIC: 22K		
						Ø	N	C	LTG	REC	MTR	A/C	HTG	DATA	KIT	MISC	PHASE	LTG	REC	MTR	A/C	HTG	DATA	KIT	MISC	Ø	N	C	DESCRIPTION	TRIP / POLE	NOTE	TYPE	CKT #											
1	-	20/1	DISPENSER #3	SR					1.1							0.0	A	0.0																			SPARE	20/1	-	2				
3	-	20/1	CONTROLS	-					0.7							0.0	B	0.0																			SPARE	20/1	-	4				
5	-	-	BUSSED SPACE	-												0.0	C																					BUSSED SPACE	-	-	6			
7	-	-	BUSSED SPACE	-												0.0	A																						BUSSED SPACE	-	-	8		
9	-	-	BUSSED SPACE	-												0.0	B																						BUSSED SPACE	-	-	10		
11	-	-	BUSSED SPACE	-												0.0	C																							BUSSED SPACE	-	-	12	
LIGHTING (KVA):			0.0			0.0			1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		CONNECTED LOAD (KVA):			1.8																
RECEPTACLES (KVA):			1.8			0.0			0.0			0.0			0.0			0.0			0.0			0.0			DEMAND LOAD (KVA):			1.8														
MOTORS (KVA):			0.0			0.0			0.0			0.0			0.0			0.0			0.0			0.0			CONNECTED LOAD (AMPS):			4.9														
A/C (KVA):			0.0			0.0			0.0			0.0			0.0			0.0			0.0			0.0			DEMAND LOAD (AMPS):			4.9														
HEATING (KVA):			0.0			0.0			0.0			0.0			0.0			0.0			0.0			0.0																				
DATA PROCESSING (KVA):			0.0			0.0			0.0			0.0			0.0			0.0			0.0			0.0																				
KITCHEN (KVA):			0			PIECES			0.0			0.0			0.0			0.0			0.0			0.0																				
MISCELLANEOUS (KVA):			0.0			0.0			0.0			0.0			0.0			0.0			0.0			0.0																				
BASIS OF DESIGN:												SIEMENS						EX = EXISTING			ME = MATCH EXISTING			SR = SEE RISER(LINE)			ES = SEE EQUIP. CONN. SCH.			AMPACITY REQUIRED:			4.9											



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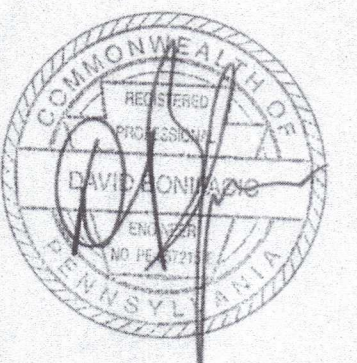


Job Name:

WAWA #0157
NORTH WALES

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NORTH WALES, PA 19454

SHEET DESCRIPTION:
ELECTRICAL SPEC (CONT.)
SWB & PNL SCHEDULES



Project #: P17773

File:

Drawn by: KC

Date(s): 07/28/2022

2022.07.25 - DD100 PRELIMINARY DESIGN

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