



**MANATEE COUNTY UTILITIES**

**WATER RECLAMATION FACILITIES COMPLIANCE  
WITH NFPA 70E**

**SWWRF SHORT CIRCUIT, COORDINATION, AND  
ARC FLASH STUDIES**

**FINAL**  
April 2015

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# SWWRF SHORT CIRCUIT, COORDINATION, AND ARC FLASH STUDIES

## 1.0 EXECUTIVE SUMMARY

### 1.1 Background

The short circuit, protective device coordination and arc flash hazard studies contained in this report provide information necessary for the safe and reliable operation and maintenance of the plant's electrical distribution system, and help the plant meet the safety requirements of NFPA 70E and OSHA 1910.132(d).

The studies in this report were performed using ETAP power system analysis software. The data required to build the electrical system model was obtained from record drawings by Carollo that were then verified with a field investigation by Mario Gamboa of Gamboa Engineers.

The studies are being performed in order to meet the requirements of NFPA 70E Article 130 Paragraph 130.5, which requires an arc flash hazard analysis be reviewed every five years.

### 1.2 Short Circuit Study

The objective of the short circuit study is to verify that the electrical distribution equipment in the plant is rated to withstand the short circuit currents that could result from a fault in the electrical distribution system.

The results of the study show that there are several components that are not sufficiently rated for the worst-case short circuit current. A table detailing which components are insufficiently rated and a recommendation is provided in Section 2.0.

Appendix F lists the details of the transformers and cables used throughout the facility. This equipment provides the impedance of a system, which limits the maximum fault current.

### 1.3 Protective Device Coordination Study

The protective device coordination study has been performed to achieve four objectives – sensitivity, security, selectivity, and safety. Sensitivity refers to the degree of certainty that a device will operate correctly under a fault. Security is the degree of certainty that a device will not operate when there is no fault condition. Selectivity means that the protective device closest to a fault trips before any upstream devices to clear the fault, isolating the resulting outage to the smallest amount of equipment possible. Safety primarily applies to the arc

flash hazard and requires that protective devices operate in as quick of a time as possible to reduce incident energy.

The results of the study show that certain protective devices are not properly coordinated and require adjustment and may otherwise require adjustment to mitigate arc flash hazard. A table detailing the recommended changes for improved coordination and arc flash hazard mitigation is included in Section 3.0.

Appendix E lists the settings of all the protective devices in the facility.

## **1.4 Arc Flash Study**

The objective of the arc flash study is to provide information that allows plant staff to take appropriate precautions when working on energized electrical equipment to reduce the potential risk of injury from an arc flash event. The results of the short circuit and coordination studies are used to calculate the incident energy and hazard boundaries based upon NFPA 70E and IEEE1584 for equipment in the electrical distribution system. OSHA regulations require that employers perform an assessment of the workplace to identify arc flash hazards. Specifically,

### **OSHA 1910.132(d)(1):**

*“The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall: Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment; communicate selection decisions to each affected employee; and select PPE that properly fits each affected employee.”*

The arc-flash labels provided with this study will help the plant to comply with these regulations by identifying the PPE Level and arc flash boundary at each piece of equipment.

## **2.0 SHORT CIRCUIT STUDY**

The objective of the short circuit study is to verify that the electrical distribution equipment in the facility is rated to withstand the available short circuit currents that could result from a fault in the electrical distribution system in accordance with NFPA 70 (NEC) Article 110 Paragraph's 110.9 and 110.10. As shown in Table 1, there are several components that are insufficiently rated for the worst-case short circuit current. It is recommended that these devices be replaced with suitably rated devices to mitigate this problem. A field visit with a factory representative can determine what devices would fit the application and what accessories would be required.

<b>Table 1 Inadequately Rated Components Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>			
<b>Breaker/Disconnect</b>	<b>Bus</b>	<b>Rated kAIC</b>	<b>Sym. kA RMS</b>
B-PNL P3	PNL P3	10	11.528
D-MCC B1-AIR BLOWER	D-MCC B1-AIR BLOWER	10	11.596
D-MCC B1-EAST DAF RECYC	D-MCC B1-EAST DAF RECYC	10	11.257
D-MCC B1-WEST DAF RECYC	D-MCC B1-WEST DAF RECYC	10	11.257
D-MCC B3-STANDBY PRESSURE	D-MCC B3-STANDBY PRESSURE	10	10.033

## 2.1 Source Data

The results of the short circuit study are completely dependent on the information in the electrical system model. As such, every effort has been made to obtain the most up-to-date information available on all equipment covered under the scope of the study. When changes are made to the electrical distribution system, the system model must be updated and a new short circuit study performed based on the updated model.

### 2.1.1 Utility Contribution

The following is the available fault current at the utility service entrance, as provided by Don Sayre, a representative for the utility, Florida Power & Light (FPL). Both the maximum (utility) and minimum (generator) fault current levels are incorporated into the electrical system model in order to capture the worst-case arc flash event. It is important to note that utility fault current levels can change due to numerous variables in the utility distribution and transmission system. This is why it is undesirable to have equipment's short circuit rating too close to the calculated short circuit values.

- Available 3-Phase Fault Current: 16,755 A.
- Nominal Voltage: 4,160V.
- X/R ratio: 12 (assumption)

## 2.2 Assumptions

The following assumptions were used in performing the study:

- All motors and other continuous or intermittent loads (actuators, heaters, etc.) are running.

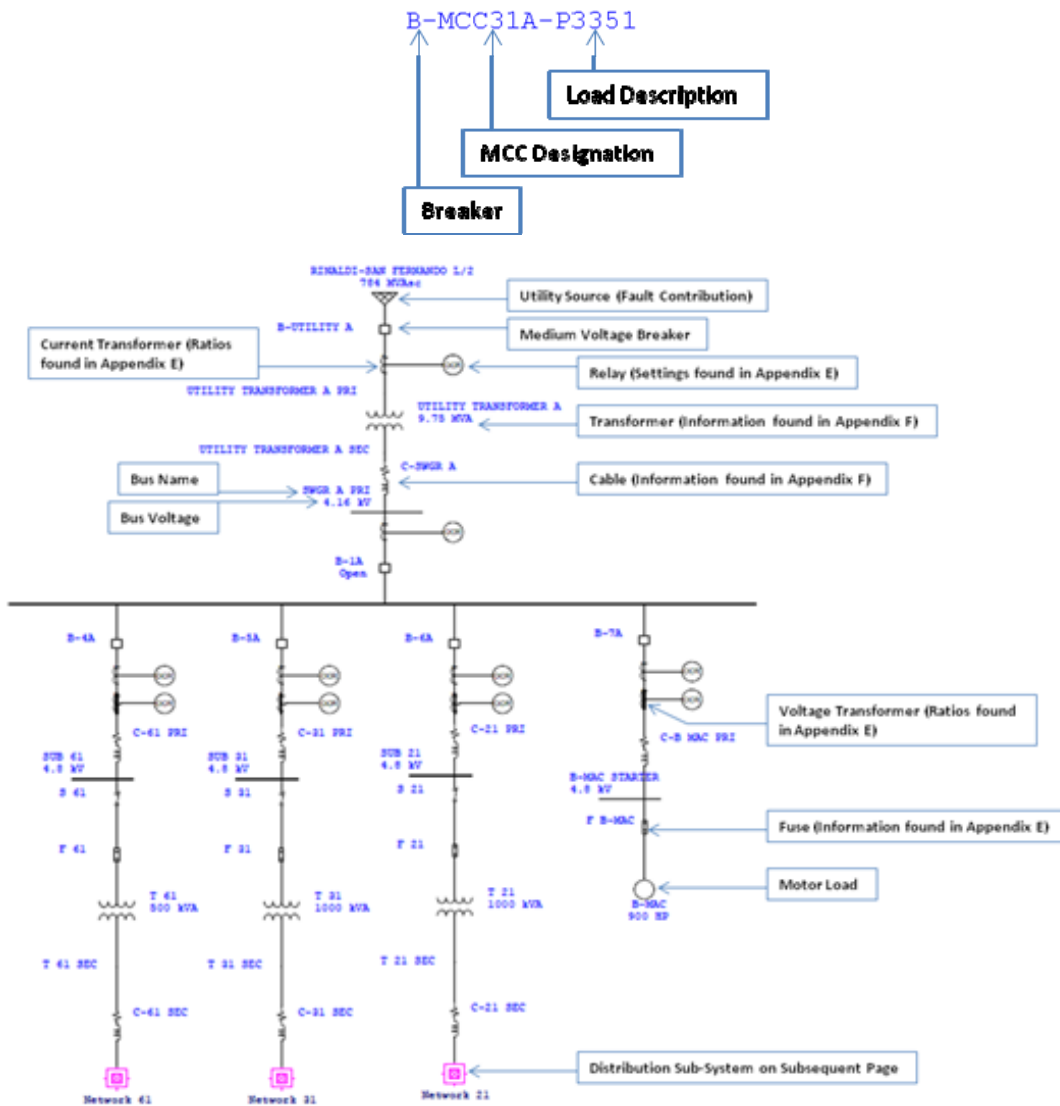
- All devices have been properly tested and maintained to ensure that they operate within their prescribed time.
- Purely electronic loads do not contribute to a fault. This includes variable frequency drives without bypass capability, uninterruptible power supplies, UV ballasts, and other rectified loads.
- Multipliers are applied to the reactance values of rotating machinery based on the recommendations in IEEE 141 (Red Book), as identified in Table 2 below:

<b>Table 2 Motor and Generator Reactance Multipliers Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>		
<b>Machine Type</b>	<b>First Cycle Network</b>	<b>Interrupting Network</b>
Turbine generators; all hydrogenerators with amortissuer windings; all condensers	1.0 Xd"	1.0 Xd"
Synchronous Motors	1.0 Xd"	1.5 Xd"
Induction Motors > 1,000 hp at ≤ 1,800 RPM	1.0 Xd"	1.5 Xd"
Induction Motors > 250 hp at 3,600 RPM	1.0 Xd"	1.5 Xd"
Induction Motors ≥ 50 hp not covered above	1.2 Xd"	3.0 Xd"
Induction Motors < 50 hp	1.67 Xd"	Neglect

Where Xd" is the direct axis sub-transient reactance. The direct axis sub-transient reactance value has a significant impact on the sub-transient fault current magnitude (inversely proportional), and therefore affects the short circuit contribution from synchronous and induction machines operating in the system.

### 2.3 One-line Diagrams

One-line diagrams of the plant's electrical distribution system are shown in Appendix A. These diagrams are generated by ETAP distribution software as part of the model construction. Each element (breakers, cables, fuses, etc) is uniquely named. Medium voltage breakers, loads, busses, and transformers are named in accordance with the record drawings. Cables, fuses, equipment terminals are named after their associated equipment. (For example, F-TRF-T2 is the fuse that protects the transformer TRF-T2.) Low voltage breakers in panelboards and switchboards are named according to their location. Similarly, low voltage breakers in MCCs are named as follows.



## 2.4 Short Circuit Reports

Appendices B1 and B2 present a set of reports used to verify that the ratings of the overcurrent protective devices in the electrical distribution system are sufficient to interrupt the available fault current. Three-phase bolted, line-to-ground, line-line-ground, and line-to-line faults are calculated and tabulated in Appendices B3 through B5. Three-phase bolted faults are usually the highest magnitude type of fault. Line-to-ground faults can be larger than three-phase bolted fault values if they occur near generators. Line-to-line fault current magnitudes are important for medium voltage and 30-cycle rated breakers because they can also be worst-case after the first cycle. Line-line-ground fault data is provided only for completeness. Short circuit results are provided as symmetrical current.



#### **2.4.1 Momentary Duty Summary Report – Appendix B1**

The momentary duty summary report evaluates the short circuit bracing of each bus by comparing it to the calculated 1/2-cycle (momentary) current.

- Low-voltage bus bracing is evaluated based on its rating in symmetrical root mean square (rms) fault current.
- Medium-voltage bus bracing is evaluated based on its rating in asymmetrical rms fault current and asymmetrical crest (peak) fault current.

The calculated values shown in the report are based on the worst-case scenario with the highest available fault current. Any inadequately rated buses are flagged by an asterisk and are colored red. The report shows that several of the busses in the plant are not adequately rated for the available fault current.

#### **2.4.2 Interrupting Duty Summary Report – Appendix B2**

The interrupting duty summary report evaluates whether each circuit breaker and fuse can safely interrupt the available fault current by comparing its interrupting capabilities to the calculated interrupting current. The calculated interrupting current is determined as follows:

- Low-voltage molded case or insulated case circuit breakers:
  - The 1/2 cycle (momentary) symmetrical rms current is used in accordance with UL 489 – Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit Breaker Enclosures.
  - Where the calculated X/R ratio at the breaker location exceeds the test X/R ratio specified in the standard, the program adjusts the required interrupting current proportionally.
- Low-voltage power circuit breakers:
  - The 1/2 cycle (momentary) symmetrical rms current is used in accordance with ANSI C37.13 – Standard for Low-Voltage Power Circuit Breakers Used in Enclosures.
  - Where the calculated X/R ratio at the breaker location exceeds the test X/R ratio specified in the standard, the program adjusts the required interrupting current proportionally.
- Medium-voltage circuit breakers:
  - The 1 1/2-4 cycle current is used to calculate the interrupting current in accordance with ANSI C37.010 – Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
- Medium-voltage fuses:

- The 1/2 cycle (momentary) symmetrical and asymmetrical rms current are used in accordance with ANSI C37.41 – Standard Design Tests for High-Voltage Fuses.

The calculated values shown in the report are based on the worst-case scenario with the highest available fault current. Any inadequately rated protective devices are flagged with an asterisk and colored red. The report shows that one of the protective devices at the plant is inadequately rated to interrupt the worst-case fault current.

#### **2.4.3 1/2 Cycle Short-Circuit Current Summary Report– Appendix B3**

The 1/2 Cycle Short-Circuit Current Summary Report shows the current for various types of faults at each bus during the first 1/2 cycle after a fault. These values are used to evaluate the bus bracing and interrupting ratings of equipment in the plant as indicated above, and to evaluate the closing and latching (momentary) ratings of medium voltage circuit breakers in accordance with IEEE C37.010.

The report includes calculations for both three phase and unbalanced faults (line-to-ground, line-to-line, and line-to-line-to-ground). The calculated current for each type of fault is different because fault current passes through a different set of impedances depending on the fault type.

#### **2.4.4 1 1/2-4 Cycle Short-Circuit Summary Report – Appendix B4**

The 1 1/2-4 Cycle Short-Circuit Summary Report shows the current at each bus from 1 1/2 to 4 cycles after a fault. These values are used to evaluate the interrupting ratings of medium voltage circuit breakers in accordance with IEEE C37.010 as indicated above.

The report includes calculations for both three phase and unbalanced faults (line-to-ground, line-to-line, and line-to-line-to-ground). The calculated current for each type of fault is different because fault current passes through a different set of impedances depending on the fault type.

#### **2.4.5 30 Cycle Short-Circuit Summary Report – Appendix B5**

The 30 Cycle Short-Circuit Summary Report shows the current at each bus after a fault's DC component has completely decayed. These values are used for setting back-up time delay relays for medium-voltage breakers.

The report includes calculations for both three phase and unbalanced faults (line-to-ground, line-to-line, and line-to-line-to-ground). The calculated current for each type of fault is different because fault current passes through a different set of impedances depending on the fault type.

### 3.0 PROTECTIVE DEVICE COORDINATION STUDY

The protective device coordination study has been performed with four objectives – sensitivity, security, selectivity, and safety. Coordination between different types of protective devices is shown by plotting their individual inverse time-current characteristics. A set of time-current curves (TCCs) showing the coordination between various protective devices at the Southwest Water Reclamation Facility has been produced as part of this report.

The coordination study has been performed using the guidelines in IEEE Standard 242 (IEEE Buff Book) - Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.

Table 3 summarizes the recommended breaker adjustments for improved coordination and arc flash hazard mitigation. A more detailed description follows in Section 3.3.

<b>Table 3 Recommended Breaker Adjustments Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>				
<b>Breaker</b>	<b>Connected to Bus:</b>	<b>Present Settings</b>	<b>New Settings</b>	<b>Reason</b>
R-SWGR-SUB1	SWGR BUS A	PU: 1.2 Time Dial: 2 Inst. PU: 75	PU: 4 Time Dial: 5 Inst. PU: 75	Improves coordination with downstream breakers.
R-SWGR-SUB2	SWGR BUS B	PU: 1.2 Time Dial: 2 Inst. PU: 75	PU: 4 Time Dial: 5 Inst. PU: 75	Improves coordination with downstream breakers.
R-SWGR-SUB3	SWGR BUS B	PU: 1.2 Time Dial: 2 Inst. PU: 75	PU: 4 Time Dial: 5 Inst. PU: 75	Improves coordination with downstream breakers.
R-SWGR-SUB4	SWGR BUS A	PU: 1.2 Time Dial: 2 Inst. PU: 75	PU: 4 Time Dial: 5 Inst. PU: 75	Improves coordination with downstream breakers.
R-SWGR-SUB7	SWGR BUS B	PU: 1.2 Time Dial: 2 Inst. PU: 75	PU: 4 Time Dial: 5 Inst. PU: 75	Improves coordination with downstream breakers.

<b>Table 3 Recommended Breaker Adjustments Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>				
<b>Breaker</b>	<b>Connected to Bus:</b>	<b>Present Settings</b>	<b>New Settings</b>	<b>Reason</b>
R-SWGR-SUB8	SWGR BUS A	PU: 1.2 Time Dial: 2 Inst. PU: 75	PU: 4 Time Dial: 5 Inst. PU: 75	Improves coordination with downstream breakers.
R-GEN 1	GEN BUS	PU: 0.8 Time Dial: 8 Inst. PU: 10	PU: 0.8 Time Dial: 16 Inst. PU: 12.5	Improves coordination with downstream breakers.
R-GEN 2	GEN BUS	PU: 0.8 Time Dial: 8 Inst. PU: 10	PU: 0.8 Time Dial: 16 Inst. PU: 12.5	Improves coordination with downstream breakers.
R-GEN MASTER	SWGR BUS A	PU: 0.53 Time Dial: 8 Inst. PU: 10	PU: 0.53 Time Dial: 19 Inst. PU: 10	Improves coordination with downstream breakers.
B-SUB1-MCC E1	SUB 1 BUS A	MAG. TRIP: 7.5	MAG. TRIP: 5	Better coordination with B-SUB1-MAIN
B-SUB1-MAIN	SUB 1 BUS A	LTPU: 1 LTD: 1 INST. PU: 3	LTPU: 0.6 LTD: 1 INST. PU: 3	Better coordination with B-SUB1-MCC E1
B-SUB2-MAIN	SUB 2 BUS B	LTPU: 1 LTD: 1 INST. PU: 3	LTPU: 0.6 LTD: 1 INST. PU: 3	Better coordination with B-SUB2-MCC E2
B-MCC E1-PNL. DP#2	MCC E1	MAG. TRIP: 10	MAG. TRIP: 9	Better coordination with B-SUB1-MCC E1
B-SUB3-MAIN	SUB 3 BUS A	LTPU: 1 LTD: 1 INST. PU: 2	LTPU: 0.6 LTD: 1 INST. PU: 3	Better coordination with B-SUB3-MCC HW1

<b>Table 3 Recommended Breaker Adjustments Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>				
<b>Breaker</b>	<b>Connected to Bus:</b>	<b>Present Settings</b>	<b>New Settings</b>	<b>Reason</b>
B-SUB3-MCC HW1	SUB 3 BUS A	MAG. TRIP: 10	MAG. TRIP: 5	Better coordination with B-SUB3-MAIN
B-SUB4-MAIN	SUB 4 BUS B	LTPU: 1 LTD: 2 INST. PU: 4	LTPU: 0.6 LTD: 1 INST. PU: 3	Better coordination with B-SUB4-MCC HW2 and SUB 4 XFMR
B-SUB4-MCC HW2	SUB 4 BUS B	MAG. TRIP: 10	MAG. TRIP: 5	Better coordination with B-SUB4-MAIN
B-SUB5-MCC B2	SUB 5 BUS A	MAG. TRIP: 10	MAG. TRIP: 5	Better coordination with B-SUB5-MAIN
B-SUB5-MCC B4	SUB 5 BUS A	MAG. TRIP: 10	MAG. TRIP: 5	Better coordination with B-SUB5-MAIN
B-SUB5-MAIN	SUB 5 BUS A	LTPU: 1 LTD: 1 INST. PU: 4	LTPU: 0.6 LTD: 1 INST. PU: 4	Better protection of SUB 5 XFMR
B-SUB6-MAIN	SUB 6 BUS B	LTPU: 1 LTD: 1 INST. PU: 3	LTPU: 0.6 LTD: 1 INST. PU: 2	Better coordination with B-SUB6-MCC B1
B-SUB6-MCC B1	SUB 6 BUS B	MAG. TRIP:10	MAG. TRIP: 5	Better coordination with B-SUB6-MAIN
B-SUB6-MCC B3	SUB 6 BUS B	MAG. TRIP:10	MAG. TRIP: 5	Better coordination with B-SUB6-MAIN
B-MCC B1-WEST DAF RECYC	MCC B1	MAG. TRIP: 10	MAG. TRIP: 5	Better coordination with MCC B1-MAIN and B-SUB6-MCC B1

<b>Table 3 Recommended Breaker Adjustments Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>				
<b>Breaker</b>	<b>Connected to Bus:</b>	<b>Present Settings</b>	<b>New Settings</b>	<b>Reason</b>
B-SUB7-MAIN	SUB 7 BUS A	LTPU: 1 LTD: 1 INST. PU: 3	LTPU: 0.6 LTD: 1 INST. PU: 4	Better coordination with B-SUB7-MCC D2
B-SUB8-MCC D1	SUB 8 BUS B	MAG. TRIP: 7.5	MAG. TRIP: 5	Better coordination with B-SUB8-MAIN
B-SUB8-MAIN	SUB 8 BUS B	LTPU: 1 LTD: 1 INST. PU: 3	LTPU: 0.6 LTD: 1 INST. PU: 2	Better coordination with B-SUB8-MCC D1
B-SUB9-DEEP WELL 1 VFD	DEEP WELL PUMP 1 VFD	LTPU: 1 LTD: D INST. PU: 12	LTPU: 1 LTD: A INST. PU: 4	Better Coordination and decreased arc flash hazard
B-SUB9-DEEP WELL PUMP 1	SUB 9 BUS A	LTPU: 1 LTD: 2 STPU: 9 STD: MIN/OUT INST. PU: 15	LTPU: 1 LTD: 1 STPU: 4 STD: MIN/OUT INST. PU: 15	Better Coordination and decreased arc flash hazard
B-SUB9-MAIN	SUB 9 BUS A	LTPU: 0.9 LTD: 1 STPU: 5 STD: INT/OUT INST. PU: 15	LTPU: 0.9 LTD: 1 STPU: 3 STD: INT/OUT INST. PU: 15	Better Coordination and decreased arc flash hazard
F-SUB9-FEED	SUB9 FEED	100A	125A	Better coordination with B-SUB9-MAIN
B-SUB9-DEEP WELL PUMP 2	SUB 9 BUS A	LTPU: 1 LTD: 2 STPU: 9 STD: MIN/OUT INST. PU: 15	LTPU: 1 LTD: 2 STPU: 7 STD: MIN/OUT INST. PU: 15	Better Coordination and decreased arc flash hazard

<b>Table 3 Recommended Breaker Adjustments Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>				
<b>Breaker</b>	<b>Connected to Bus:</b>	<b>Present Settings</b>	<b>New Settings</b>	<b>Reason</b>
B-SUB9/10 DEEP WELL 2 VFD	DEEP WELL PUMP 2 VFD	LTPU: 1 LTD: D INST. PU: 12	LTPU: 1 LTD: B INST. PU: 4	Better Coordination and decreased arc flash hazard
B-SUB10-DEEP WELL PUMP 2	SUB 10 BUS B	LTPU: 1 LTD: 2 STPU: 9 STD: MIN/OUT INST. PU: 15	LTPU: 1 LTD: 2 STPU: 4 STD: MIN/OUT INST. PU: 15	Better Coordination and decreased arc flash hazard
B-SUB10-DEEP WELL 3 VFD	DEEP WELL PUMP 3 VFD	LTPU: 1 LTD: D INST. PU: 12	LTPU: 1 LTD: B INST. PU: 4	Better Coordination and decreased arc flash hazard
B-SUB10-DEEP WELL PUMP 3	SUB 10 BUS B	LTPU: 1 LTD: 2 STPU: 9 STD: MIN/OUT INST. PU: 15	LTPU: 1 LTD: 1 STPU: 3 STD: MIN/OUT INST. PU: 15	Better Coordination and decreased arc flash hazard
B-SUB10-MAIN	SUB 10 BUS B	LTPU: 0.9 LTD: 1 STPU: 5 STD: INT/OUT INST. PU: 15	LTPU: 0.9 LTD: 1 STPU: 2.5 STD: INT/OUT INST. PU: 15	Better Coordination and decreased arc flash hazard
F-SUB10-FEED	SUB10 FEED	100A	125A	Better coordination with B-SUB10-MAIN
B-SWBD11-DEEP WELL 4 VFD	DEEP WELL PUMP 4 VFD	LTPU: 1 LTD: D INST. PU: 12	LTPU: 1 LTD: D INST. PU: 2	Better coordination with B-SUB 11-SWBD 11 and B-SWBD11-DEEP WELL PUMP 4

<b>Table 3 Recommended Breaker Adjustments Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>				
<b>Breaker</b>	<b>Connected to Bus:</b>	<b>Present Settings</b>	<b>New Settings</b>	<b>Reason</b>
B-SWBD11-DEEP WELL PUMP 4	SWBD 11 BUS A	LTPU: 1 LTD: 16 STPU: 8 STD: 0.3 INST. PU: 4	LTPU: 1 LTD: 16 STPU: 8 STD: 0.3 INST. PU: 2	Better Coordination and decreased arc flash hazard
B-SWBD11-MAIN	SWBD 11 BUS A	LTPU: FIXED LTD: FIXED INST. PU: 10	LTPU: FIXED LTD: FIXED INST. PU: 2	Better coordination with B-SUB 11-SWBD 11
B-SUB 11-SWBD 11	SUB11 LS	LTPU: FIXED LTD: FIXED INST. PU: 2	LTPU: FIXED LTD: FIXED INST. PU: 4	Better coordination with B-SWBD11-MAIN and B-SWBD11-DEEP WELL PUMP 4
B-SWBD12-DEEP WELL 6 VFD	DEEP WELL PUMP 6 VFD	LTPU: 1 LTD: D INST. PU: 12	LTPU: 1 LTD: D INST. PU: 2	Better coordination with B-SUB 12-SWBD 12, B-SWBD12-MAIN and B-SWBD12-DEEP WELL PUMP 6
B-SWBD12-DEEP WELL PUMP 6	SWBD 12 BUS B	LTPU: 1 LTD: 16 STPU: 8 STD: 0.3 INST. PU: 4	LTPU: 1 LTD: 16 STPU: 8 STD: 0.3 INST. PU: 2	Better Coordination and decreased arc flash hazard
B-SUB 12-SWBD 12	SUB12 LS	LTPU: FIXED LTD: FIXED INST. PU: 2	LTPU: FIXED LTD: FIXED INST. PU: 4	Better coordination with B-SWBD12-DEEP WELL 6 VFD and B-SWBD12-DEEP WELL PUMP 6



## 3.1 Source Data

### 3.1.1 Utility Protective Devices

The model information and settings for utility protective devices are based on information provided by Florida Power & Light (FPL). The utility fuse is listed as a 25A “KS” fuse.

## 3.2 Time-Current Curves

Time-current curves are provided for the entire electrical distribution system, starting at the utility service and continuing through the largest feeder breaker of each 480V motor control center (MCC), switchboard, or panelboard. Time-current curves (TCC) are a visual representation that shows coordination of protective devices. Current (in Amps based upon a reference Voltage) is plotted on the X-axis and tripping time (in seconds) is plotted on the Y-axis, both on a logarithmic scale. Protective devices each have their own inverse time-current tripping characteristics which are identified by colored bands on the plot. When analyzing the curves, the devices are expected to trip at the top-most edge of their band for a given current.

To define the tripping time of a given circuit, the curves are used by identifying the short circuit current and finding the curve (for a breaker through which the short circuit is travelling) that provides the lowest time to trip. If a protective device is tripped during this short circuit, the protective devices have adequate sensitivity. If the first protective device that trips is the one closest to the fault, the system is said to have selectivity. Identifying a normal operating current (with a given duration) on a TCC plot and showing that no protective device will trip is security.

To ensure proper selectivity, the TCC for the protective device closest to the fault needs to be located to the left of the TCC for the upstream protective devices as displayed on the TCC plot. When this can be achieved, it is referred to as having proper coordination. When portions of the TCC for the protective device closest to the fault overlap the TCC for the upstream protective devices, coordination is not achieved. There are instances when the breaker closest to the fault does not need to clear the fault before the upstream protective device. This occurs when two devices are in series and no other branch circuits exist between the two devices. Coordination cannot always be achieved between protective devices due to the inherent limitations of each protective device, but it is important to coordinate as much as possible to deliver the highest level of security and selectivity for the electrical system.

In addition to the protective device settings needed for coordination, the TCCs include the following information:

- Transformer damage curves – used to verify proper transformer protection. Curves are shifted to the conservative “frequent fault” curves per ANSI C57.

- Motor starting curves – used to ensure protective devices will not experience nuisance trips on motor inrush currents and motor starting curves. Assuming a locked-rotor code F, motors on full voltage starters are assumed to have 6 per-unit current for 5 seconds. Motors on reduced voltage starters have a start time of 10 seconds. Additionally, upon starting, motors can experience an initial transient current that can be as high as 2.8 times the locked rotor current for one-half line cycle. This can lead to nuisance tripping.

### 3.3 Coordination Results

Refer to Appendix C1 for the results of the protective device coordination study for the “As-found” settings. Refer to Appendix C2 for the recommended changes to the protective device coordination study. The results of the coordination study are as follows:

- TCC 01: The coordination of the relays is good, although R-SWGR-TIE has the exact same curve as R-SWGR-MAIN2. The utility transformer is adequately protected by the secondary device. We recommended changing the settings of relay R-SWGR-SUB3 to a pickup of 4 and a time dial setting of 5. This will improve coordination with downstream breakers as will be shown in subsequent TCCs.
- TCC 02: The coordination of the relays is good, although R-SWGR-TIE has the exact same curve as R-SWGR-MAIN1. The utility transformer is adequately protected by the secondary device. We recommended changing the settings of relay R-SWGR-SUB1 to a pickup of 4 and a time dial setting of 5. This will improve coordination with downstream breakers as will be shown in subsequent TCCs.
- TCC 03: These devices have very poor coordination. The first relay to trip could be the most upstream, R-GEN 1. R-GEN MASTER has a very similar trip curve but it is shifted to the right. This may be desirable as R-GEN MASTER protects two generators, rather than just one. R-SWGR-SUB3 and R-SWGR-TIE are correctly coordinated with each other. In addition to the previously mentioned changes to R-SWGR-SUB3 (pickup to 4, time dial to 5), we recommend changing the time dial to 16 and instantaneous pickup to 12.5 on R-GEN 1 and changing the time dial to 19 on R-GEN MASTER. This greatly improves the coordination.
- TCC 04: These devices are not well coordinated. B-SUB1-MAIN will likely trip before B-SUB1-MCC E1. If there is a fault at MCC-E1, it could de-energize all of Sub 1 Bus A, rather than just MCC E1. There is mis-coordination between F-SUB1-FEED, B-SUB1-MAIN and B-SUB1-MCC E1. In the short-time region, R-SWGR-SUB1 could trip before any of the other devices. We recommend changing the magnetic trip setting on B-SUB1-MCC E1 from 7.5(med) to 5(low) while also implementing the previously mentioned changes to R-SWGR-SUB1 (pickup to 4, time dial to 5). Change the long-time pickup of B-SUB1-MAIN from 1 to 0.6. Note that a 500 kVA transformer has a 600 amp full load rating at 480 volts, yet it feeds a 1200A breaker, B-SUB1-MAIN. This is a violation of 2014 NEC 450.3.B.

- TCC 05: These devices are not well coordinated. B-SUB2-MAIN could possibly trip before B-SUB2-MCC E2. If there is a fault at MCC-E2, it could de-energize all of Sub 2 Bus B, rather than just MCC E2. There is mis-coordination between F-SUB2-FEED and B-SUB2-MAIN and B-SUB2-MCC E2. In the short-time region, R-SWGR-SUB2 could trip before any of the other devices. We recommended changing the settings of relay R-SWGR-SUB2 to a pickup of 4 and a time dial setting of 5 and the long-time pickup of B-SUB2-MAIN from 1 to 0.6. Note that a 500 kVA transformer has a 600 amp full load rating at 480 volts, yet it feeds a 1200A breaker, B-SUB2-MAIN. This is a violation of 2014 NEC 450.3.B.
- TCC 06: The trip curves of B-SUB2-PNL CP and B-SUB2-PNL CP (2) overlap, but this is acceptable as these are series devices. The primary side breaker overlaps the ANSI in-rush current point of the transformer, which could cause nuisance tripping, and the downstream breaker will trip before the transformer operates at full-load. However, the transformer is adequately protected and the breakers are not adjustable so coordination cannot be improved without replacing the breakers.
- TCC 07: B-SUB2-PNL L1 is to the left of the transformer's ANSI in-rush current point, which could lead to nuisance tripping. The transformer could also be better protected. In order to change the trip curve, a new breaker would need to be installed. If there are no problems presently, no changes are recommended.
- TCC 08: These two breakers have very good coordination, although there is some overlap in the instantaneous region. However, if the previously recommended change to B-SUB1-MCC E1 (trip decreased from 7.5 to 5) has been implemented, there is overlap throughout the short-time region. This can be improved by changing the magnetic trip of B-MCC E1-PNL. DP #2 from 10 to 9.
- TCC 09: These two breakers have good coordination, although there is some overlap in the instantaneous region. No changes recommended.
- TCC 10: The coordination between the protective devices is not good. B-SUB3-MAIN is predicted to trip before B-SUB3-MCC HW1 if there is a fault at MCC HW1, which will de-energize all of Sub 3. There is mis-coordination between F-SUB3-FEED and B-SUB3-MCC HW1. In the short-time region, R-SWGR-SUB3 could trip before any of the other devices. We recommend changing the instantaneous pickup from 2 to 3 and the long-time pickup from 1 to 0.6 on B-SUB3-MAIN and the magnetic trip of B-SUB3-MCC HW1 from 10 to 5, while also implementing the previously mentioned changes to R-SWGR-SUB3 (pickup to 4, time dial to 5).
- TCC 11: The coordination between the protective devices is not good. B-SUB4-MAIN is expected to trip before B-SUB4-MCC HW2 if there is a fault at MCC HW2, which will de-energize all of Sub 4. There is mis-coordination between F-SUB4-FEED and B-SUB4-MAIN and B-SUB4-MCC HW2. In the short-time region, R-SWGR-SUB4 could trip before any of the other devices. We recommend changing the

instantaneous pickup of B-SUB4-MAIN from 4 to 3, its long-time pickup from 1 to 0.6, and its long-time band from 2 to 1 to better protect the transformer, while also changing the magnetic trip of B-SUB4-MCC HW2 from 10 to 5. We also recommend changing the settings of relay R-SWGR-SUB4 to a pickup of 4 and a time dial setting of 5.

- TCC 12: These two breakers have very good coordination, although there is some overlap in the instantaneous region. The coordination remains correct after the previously recommended change to B-SUB3-MCC HW1 (trip decreased from 10 to 5) is implemented. No additional changes recommended.
- TCC 13: These two breakers have very good coordination, although there is some overlap in the instantaneous region. The coordination remains correct after the previously recommended change to B-SUB4-MCC HW2 (trip decreased from 10 to 5) is implemented. No additional changes recommended.
- TCC 14: The trip curve of B-MCC HW2-PNL LHW overlaps the transformer's damage curve, rather than being to the left of it. However, the breaker has a fixed trip setting. The trip curve overlaps the transformer's in-rush current. Expect nuisance tripping at some time, depending on where in the cycle the transformer is energized. There are no recommended changes.
- TCC 15: The coordination between the protective devices is not good. B-SUB5-MAIN is expected to trip before B-SUB5-MCC B2 if there is a fault at MCC B2, which will de-energize all of Sub 5. There is mis-coordination between F-SUB5-FEED and B-SUB5-MAIN and B-SUB5-MCC B2. In the short-time region, R-SWGR-SUB3 could trip before any of the other devices. We recommend changing the magnetic trip of B-SUB5-MCC B2 from 10 to 5 and the long-time pickup of B-SUB5-MAIN from 1 to 0.6, while also implementing the previously mentioned changes to R-SWGR-SUB3 (pickup to 4, time dial to 5). These changes will not solve all the problems but will improve the overall coordination while continuing to protect the transformer.
- TCC 16: The coordination between the protective devices is not good. B-SUB6-MAIN is expected to trip before B-SUB6-MCC B1 if there is a fault at MCC B1, which will de-energize all of Sub 6. There is mis-coordination between F-SUB6-FEED and B-SUB6-MAIN and B-SUB6-MCC B1. In the short-time region, R-SWGR-SUB4 could trip before any of the other devices. We recommend changing the instantaneous pickup from 3 to 2 and long-time pickup from 1 to 0.6 on B-SUB6-MAIN, while also changing the magnetic trip of B-SUB6-MCC B1 from 10 to 5. Also implement the previously mentioned changes to R-SWGR-SUB4 (pickup to 4, time dial to 5).
- TCC 17: These two breakers have very good coordination, although there is some overlap in the instantaneous region. The coordination remains correct after the previously recommended change to B-SUB5-MCC B2 (trip decreased from 10 to 5) is implemented. No additional changes recommended.

- TCC 18: These two breakers are not coordinated. There is overlap throughout the trip curves and B-MCC B2-PNL P3 could trip before B-PNL P3. Neither adequately protects the transformer, but the transformer relies on secondary protection. No changes recommended.
- TCC 19: The transformer is adequately protected by the breaker. The trip curve overlaps the transformer's inrush current, but as long as nuisance tripping is not a problem, there are no recommended changes.
- TCC 20: These two breakers have very good coordination, although there is some overlap in the instantaneous region. We do recommend changing the magnetic trip setting of B-SUB5-MCC B4 from 10 to 5, just as we previously recommended changing the magnetic trip of B-SUB5-MCC B2 from 10 to 5.
- TCC 21: The trip curve of B-MCC B4-PNL LP2 overlaps the transformer's damage curve, rather than being to the left of it. However, the breaker has a fixed trip setting. The transformer relies on the secondary side protective device for adequate protection. The breaker's trip curve coordinates with the transformer's in-rush current. No changes recommended.
- TCC 22: These breakers are coordinated very well. There is some overlap in the instantaneous region between MCC 1-MAIN and B-SUB6-MCC 1, but nothing can be done to change this. No changes recommended.
- TCC 23: The protective breaker does not coordinate with the transformer. The breaker will trip due to the transformer's inrush current. It is a code violation to feed a transformer with an MCP. We recommend changing the protective device to a thermal magnetic breaker.
- TCC 24: The coordination between these breakers could be better. There is much overlap in the instantaneous region, in the short-time region between B-MCC B1-WEST DAF RECYC and MCC B1-MAIN, and in the long-time region between MCC B1-MAIN and B-SUB6-MCC B1. We recommend changing the magnetic trip setting of B-MCC B1-WEST DAF RECYC from 10 to 5. The previously mentioned change to B-SUB6-MCC B1 (trip decreased from 10 to 5) will actually align the curve directly over MCC B1-MAIN. This is not a problem as these are series devices, which both protect MCC B1. None of the breaker curves interfere with the motor starting curve.
- TCC 25: The transformer is adequately protected by the breaker. The trip curve overlaps the transformer's inrush current. Expect nuisance tripping at some time, depending on where in the cycle the transformer is energized. There are no recommended changes.
- TCC 26: These two breakers have very good coordination, although there is some overlap in the instantaneous region. We recommend changing the magnetic trip on B-

SUB6-MCC B3 from 10 to 5, just as we recommended with B-SUB6-MCC B1. Neither of the trip curves interferes with the motor starting curve.

- TCC 27: There is overlap between the trip curves of these devices. F-SUB7-FEED is not coordinated with B-SUB7-MAIN and B-SUB7-MCC D2 in the long-time band. In the short-time region, R-SWGR-SUB7 could trip before any of the other devices. We recommend changing the instantaneous pickup from 3 to 4 and long-time pickup from 1 to 0.6 on B-SUB7-MAIN to improve coordination while still protecting the transformer. Also change the settings of relay R-SWGR-SUB7 to a pickup of 4 and a time dial setting of 5.
- TCC 28: These two breakers have very good coordination, although there is some overlap in the instantaneous region. Neither of the trip curves interferes with the motor starting curve. No changes recommended.
- TCC 29: The transformer is adequately protected by the breaker. The trip curve overlaps the transformer's in-rush current. Expect nuisance tripping at some time, depending on where in the cycle the transformer is energized. There are no recommended changes.
- TCC 30: These two breakers have very good coordination, although there is some overlap in the instantaneous region. No changes recommended.
- TCC 31: There is much overlap between the trip curves of these devices. F-SUB8-FEED is not coordinated with B-SUB8-MAIN and B-SUB8-MCC D1. In the short-time region, R-SWGR-SUB8 could trip before any of the other devices. It is likely that B-SUB8-MAIN will trip before B-SUB8-MCC D1. We recommend changing the magnetic trip of B-SUB8-MCC D1 from 7.5 to 5, while also changing the long-time pickup from 1 to 0.6 and the instantaneous pickup from 3 to 2 on B-SUB8-MAIN to improve coordination while still protecting the transformer. In addition, we recommended changing the settings of relay R-SWGR-SUB8 to a pickup of 4 and a time dial setting of 5.
- TCC 32: MCC D1 MAIN and B-MCC D1-SUPERANANT have good coordination although there is some overlap in the instantaneous region. MCC D1 MAIN is not coordinated with B-SUB8-MCC D1 and the coordination gets worse if the previously recommended change to B-SUB8-MCC D1 (trip decreased from 7.5 to 5) is implemented, but these are series devices that offer redundant protection for MCC D1. No further changes recommended.
- TCC 33: The transformer is adequately protected by the breaker. The trip curve overlaps the transformer's inrush current. Expect nuisance tripping at some time, depending on where in the cycle the transformer is energized. There are no recommended changes.

- TCC 34: These two breakers have very good coordination, although there is some overlap in the instantaneous region. No changes recommended.
- TCC 35: The transformer is adequately protected by the breaker. The trip curve overlaps the transformer's inrush current. Expect nuisance tripping at some time, depending on where in the cycle the transformer is energized. There are no recommended changes.
- TCC 36: There is overlap between the trip curves of these protective devices. Nothing is properly coordinated, but the transformer is adequately protected. We recommend changing the long-time band from D to A and instantaneous pickup from 12 to 4 on B-SUB9-DEEP WELL 1 VFD, while changing the short-time pickup from 9 to 4 and long-time band from 2 to 1 on B-SUB9-DEEP WELL PUMP 1, and the short-time pickup from 5 to 3 on B-SUB9-MAIN, along with the previously mentioned change to R-SWGR-SUB1 (pickup to 4, time dial to 5). F-SUB9-FEED is still poorly coordinated and should be replaced with a larger size fuse, as long as the new fuse does not exceed any equipment ratings, to improve coordination with the other devices and the transformer's in-rush current.
- TCC 37: There is overlap between the trip curves of these protective devices. The breakers are not properly coordinated, but the transformer is adequately protected. We recommend changing the long-time band from D to B and instantaneous pickup from 12 to 4 on B-SUB10-DEEP WELL 3 VFD, while changing the short-time pickup from 9 to 3 and long-time band from 2 to 1 on B-SUB10-DEEP WELL PUMP 3, and the short-time pickup from 5 to 2.5 on B-SUB10-MAIN, along with the previously mentioned change to R-SWGR-SUB2 (pickup to 4, time dial to 5). F-SUB10-FEED is still poorly coordinated and should be replaced with a larger size fuse, as long as the new fuse does not exceed any equipment ratings, to improve coordination with the other devices and the transformer's in-rush current.
- TCC 38: These devices are poorly coordinated. R-SWGR-SUB7 is expected to trip before F-SW11-SUB13 in the short-time region. No additional changes recommended other than the previously mentioned change to R-SWGR-SUB7 (pickup to 4, time dial to 5).
- TCC 39: The coordination between these devices should be improved. B-SUB11-SWBD11 is likely to trip before any of the other devices. We recommend changing the instantaneous pickup from 12 to 2 on B-SWBD11-DEEP WELL 4 VFD, the instantaneous pickup from 4 to 2 on B-SWBD11-DEEP WELL PUMP 4, the instantaneous pickup from 10 to 2 on B-SWBD11-MAIN, and the instantaneous pickup from 2 to 4 on B-SUB 11-SWBD 11. These changes will improve the overall coordination between these devices.
- TCC 40: These devices are poorly coordinated. R-SWGR-SUB8 is expected to trip before F-SW12-SUB14 in the short-time region. No additional changes recommended

other than the previously mentioned change to R-SWGR-SUB8 (pickup to 4, time dial to 5).

- TCC 41: The coordination between these devices should be improved. B-SUB12-SWBD12 is likely to trip before any of the other devices. We recommend changing the instantaneous pickup from 12 to 2 on B-SWBD12-DEEP WELL 6 VFD, the instantaneous pickup from 4 to 2 on B-SWBD12-DEEP WELL PUMP 6, and the instantaneous pickup from 2 to 4 on B-SUB 12-SWBD 12. These changes will improve the overall coordination between these devices.
- TCC 42: The coordination between these devices is good except for R-SWGR-SUB8. The previously mentioned changes to R-SWGR-SUB8 (pickup to 4, time dial to 5) will improve the coordination, but will also raise the PPE Level at the secondary of TR-T7A and the line side terminals of B-MCC D4. The transformer is adequately protected.
- TCC 43: This TCC shows the ground fault settings of the 4.16kV relays. They are properly coordinated and no changes are recommended.

#### 4.0 ARC FLASH STUDY

The arc flash study builds upon the results of the short circuit and coordination studies to calculate the incident energy, PPE Level, and arc flash boundary for each piece of equipment in the electrical distribution system. Results of this study are printed on labels and attached to electrical equipment to inform plant staff of arc flash hazards associated with working on energized equipment. These calculations have been performed in accordance with IEEE 1584 - Guide for Performing Arc Flash Hazard Calculations.

The incident energy varies with changes in the arcing fault current and the resulting protective device clearing time that occur during different operational conditions within the plant. In order to determine the worst-case incident energy, a number of different operational scenarios have been evaluated. The operational scenarios evaluated for this report are identified in Table 4 below.

<b>Table 4 Operational Scenarios Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>		
<b>Scenario</b>	<b>Configuration</b>	<b>Description</b>
Utility Power	Utility	Normal Running Condition
Generator 1	Generator 1	Running on Generator Power Supplied from Generator 1
Generator 2	Generator 2	Running on Generator Power Supplied from Generator 2
Generator 1 & 2	Generator 1 & 2	Running on Generator Power Supplied from Generators 1 & 2



The incident energy calculations allow electrical equipment to be placed into a PPE Level between 0 and 4. The personal protective equipment (PPE) recommended by NFPA 70E for each of the levels is shown in Table 6 below. Where the calculations determine that the incident energy is above a Level 4, the equipment is identified as “DANGEROUS.” There is no PPE available that is suitable for use when working on energized equipment identified as “DANGEROUS.” “DANGEROUS” labels are printed with a red border.

Note that wearing the recommended PPE does not guarantee safety - it is intended to reduce risk to personnel and limit burns to second degree. Whenever possible, equipment should be de-energized before work is performed.

Table 5 lists the Arc Flash hazards that are a Level 3 or higher and the corresponding system configuration. If the recommended breaker settings in Table 3 are implemented, a new PPE Level results in some instances.

<b>Table 5 Arc Flash Hazards Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>					
<b>Bus/Breaker</b>	<b>PPE Level</b>	<b>Configuration</b>	<b>Recommendation</b>	<b>New PPE Level</b>	<b>Configuration</b>
DEEP WELL PUMP 1 VFD	LEVEL 3	GENERATOR 2	B-SUB9-DEEP WELL 1 VFD: Change long-time band from D to A. Change instantaneous pickup from 12 to 4. B-SUB9-DEEP WELL PUMP 1: Change short-time pickup from 9 to 7.	LEVEL 1	NORMAL (UTILITY)
DEEP WELL PUMP 2 VFD	LEVEL 3	GEN 1&2	B-SUB9/10-DEEP WELL 2 VFD: Change long-time band from D to B. Change instantaneous pickup from 12 to 4. B-SUB10-DEEP WELL PUMP 2: Change short-time pickup from 9 to 4. B-SUB9-DEEP WELL PUMP 2: Change short-time pickup from 9 to 7.	LEVEL 1	NORMAL (UTILITY)

<b>Table 5 Arc Flash Hazards Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>					
<b>Bus/Breaker</b>	<b>PPE Level</b>	<b>Configuration</b>	<b>Recommendation</b>	<b>New PPE Level</b>	<b>Configuration</b>
DEEP WELL PUMP 3 VFD	LEVEL 3	GENERATOR 2	B-SUB10-DEEP WELL 3 VFD: Change long-time band from D to B. Change instantaneous pickup from 12 to 4. B-SUB10-DEEP WELL PUMP 3: Change short-time pickup from 9 to 4.	LEVEL 1	NORMAL (UTILITY)
FPL PRIMARY	LEVEL 4	NORMAL (UTILITY)	Nothing to be done. On primary (utility) side of transformers.		
FPL SERVICE	>LEVEL 4	NORMAL (UTILITY)	Nothing to be done on client side as this is fed directly from utility.		
GEN BUS	LEVEL 3	GEN 1&2	No recommendations to mitigate this.		
MCC D4 LS	LEVEL 3	GEN 1&2	R-SWGR-SUB7: Change pickup to 4 and time dial to 5	LEVEL 4	GEN 1&2
MCC D5 LS	LEVEL 3	GEN 1&2	R-SWGR-SUB8: Change pickup to 4 and time dial to 5	LEVEL 4	GEN 1&2
S-DEEP WELL 2 LOAD	LEVEL 3	GENERATOR 2	B-SUB10-DEEP WELL PUMP 2: Change short-time pickup from 9 to 4. B-SUB9-DEEP WELL PUMP 2: Change short-time pickup from 9 to 7.	LEVEL 2	NORMAL (UTILITY)

<b>Table 5 Arc Flash Hazards Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>					
<b>Bus/Breaker</b>	<b>PPE Level</b>	<b>Configuration</b>	<b>Recommendation</b>	<b>New PPE Level</b>	<b>Configuration</b>
S-SUB9-DEEP WELL 2	LEVEL 3	GENERATOR 2	B-SUB9-DEEP WELL PUMP 2: Change short-time pickup from 9 to 7.	LEVEL 2	NORMAL (UTILITY)
S-SUB10-DEEP WELL 2	LEVEL 3	GENERATOR 2	B-SUB10-DEEP WELL PUMP 2: Change short-time pickup from 9 to 4.	LEVEL 2	NORMAL (UTILITY)
SUB1 LS	LEVEL 2	GEN 1&2	R-SWGR-SUB1: Change pickup to 4 and time dial to 5	LEVEL 3	GEN 1 & 2
SUB2 LS	LEVEL 2	GEN 1&2	R-SWGR-SUB2: Change pickup to 4 and time dial to 5	LEVEL 3	GEN 1 & 2
SUB3 MAIN LS	LEVEL 2	NORMAL (UTILITY)	R-SWGR-SUB3: Change pickup to 4 and time dial to 5	LEVEL 3	GEN 1 & 2
SUB4 MAIN LS	LEVEL 2	NORMAL (UTILITY)	R-SWGR-SUB4: Change pickup to 4 and time dial to 5	LEVEL 3	GEN 1 & 2
SUB5 MAIN LS	LEVEL 3	GEN 1&2	R-SWGR-SUB3: Change pickup to 4 and time dial to 5	LEVEL 4	GEN 1 & 2
SUB6 MAIN LS	LEVEL 3	GEN 1&2	R-SWGR-SUB4: Change pickup to 4 and time dial to 5	LEVEL 4	GEN 1 & 2
SUB7 MAIN LS	LEVEL 2	NORMAL (UTILITY)	R-SWGR-SUB7: Change pickup to 4 and time dial to 5	LEVEL 3	GEN 1 & 2
SUB8 MAIN LS	LEVEL 2	NORMAL (UTILITY)	R-SWGR-SUB8: Change pickup to	LEVEL 3	GEN 1 & 2

<b>Table 5 Arc Flash Hazards Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>					
<b>Bus/Breaker</b>	<b>PPE Level</b>	<b>Configuration</b>	<b>Recommendation</b>	<b>New PPE Level</b>	<b>Configuration</b>
			4 and time dial to 5		
SUB9 LS	LEVEL 3	GENERATOR 2	R-SWGR-SUB1: Change pickup to 4 and time dial to 5	LEVEL 4	GEN 1 & 2
SUB10 LS	LEVEL 3	GENERATOR 2	R-SWGR-SUB2: Change pickup to 4 and time dial to 5	LEVEL 4	GEN 1 & 2
SUB11 LS	LEVEL 3	NORMAL (UTILITY)	R-SWGR-SUB7: Change pickup to 4 and time dial to 5	>LEVEL 4	NORMAL (UTILITY)
SUB12 LS	LEVEL 3	NORMAL (UTILITY)	R-SWGR-SUB8: Change pickup to 4 and time dial to 5	>LEVEL 4	NORMAL (UTILITY)
SWGR BUS A	LEVEL 3	NORMAL (UTILITY)	No recommendations to mitigate this.		
SWGR BUS B	LEVEL 3	NORMAL (UTILITY)	No recommendations to mitigate this.		
SWGR MAIN 1 LS	LEVEL 4	NORMAL (UTILITY)	Nothing to be done on client side as this is fed directly from utility.		
SWGR MAIN 2 LS	LEVEL 4	NORMAL (UTILITY)	Nothing to be done on client side as this is fed directly from utility.		
T-DEEP WELL PUMP 1	LEVEL 3	NORMAL (UTILITY)	B-SUB9-DEEP WELL 1 VFD: Change long-time band from D to A. Change instantaneous pickup from 12 to 4.	LEVEL 1	NORMAL (UTILITY)

<b>Table 5 Arc Flash Hazards Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>					
<b>Bus/Breaker</b>	<b>PPE Level</b>	<b>Configuration</b>	<b>Recommendation</b>	<b>New PPE Level</b>	<b>Configuration</b>
			B-SUB9-DEEP WELL PUMP 1: Change short-time pickup from 9 to 7.		
T-DEEP WELL PUMP 2	LEVEL 3	NORMAL (UTILITY)	B-SUB9/10-DEEP WELL 2 VFD: Change long-time band from D to B. Change instantaneous pickup from 12 to 4. B-SUB10-DEEP WELL PUMP 2: Change short-time pickup from 9 to 4. B-SUB9-DEEP WELL PUMP 2: Change short-time pickup from 9 to 7.	LEVEL 1	NORMAL (UTILITY)
T-DEEP WELL PUMP 3	LEVEL 3	NORMAL (UTILITY)	B-SUB10-DEEP WELL 3 VFD: Change long-time band from D to B. Change instantaneous pickup from 12 to 4. B-SUB10-DEEP WELL PUMP 3: Change short-time pickup from 9 to 4.	LEVEL 1	NORMAL (UTILITY)

<b>Table 5 Arc Flash Hazards Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>					
<b>Bus/Breaker</b>	<b>PPE Level</b>	<b>Configuration</b>	<b>Recommendation</b>	<b>New PPE Level</b>	<b>Configuration</b>
T-GEN 1	LEVEL 3	GEN 1&2	Nothing to be done as this is at the generator terminals, ahead of any breaker.		
T-GEN 2	LEVEL 3	GEN 1&2	Nothing to be done as this is at the generator terminals, ahead of any breaker.		
T-TR-T7A-SEC	LEVEL 3	GENERATOR 2	R-SWGR-SUB7: Change pickup to 4 and time dial to 5	LEVEL 4	GEN 1 & 2
T-TR-T8A-SEC	LEVEL 3	GENERATOR 2	R-SWGR-SUB8: Change pickup to 4 and time dial to 5	LEVEL 4	GEN 1 & 2

Note that in multiple instances, the required PPE Level increased after implementing the recommended changes to the switchgear relays. The recommended changes are necessary for proper device coordination, but the safety of maintenance personnel is the most important priority. We highly recommend the use of a "Maintenance Mode" on these protective devices. Maintenance Mode is described further in section 4.3.2.

<b>Table 6 Personal Protective Equipment (PPE) Water Reclamation Facilities Compliance With NFPA 70E Manatee County</b>		
<b>PPE Level</b>	<b>Clothing Description</b>	<b>Required Minimum Arc Rating of PPE (cal/cm<sup>2</sup>)</b>
0	Non-melting, non-flammable materials (i.e., untreated cotton, wool, rayon, or silk, or blends of these materials) with a fabric weight of at least 4.5 oz/yd <sup>2</sup> , safety glasses or safety goggles, hearing protection, leather gloves.	N/A
1	Arc-rated, flame-resistant (AR) shirt and AR pants or AR coverall, face shield or arc flash suit hood, jacket, hard hat, safety glasses or goggles, hearing protection, leather gloves, leather work shoes	4
2	Arc-rated, flame-resistant (AR) shirt and AR pants or AR coverall, face shield or arc flash suit hood, jacket, hard hat, safety glasses or goggles, hearing protection, leather gloves, leather work shoes	8
3	Arc-rated AR shirt and pants or AR coverall and arc flash suit selected so that the system arc rating meets the required minimum, hard hat, AR hard hat liner, safety glasses or goggles, hearing protection, arc-rated gloves, leather work shoes	25
4	Arc-rated AR shirt and pants or AR coverall, and arc flash suit selected so that the system arc rating meets the required minimum, hard hat, AR hard hat liner, safety glasses or goggles, hearing protection, arc-rated gloves, leather work shoes	40
Note: Site-specific PPE Levels utilized by Manatee County maintenance personnel		

#### 4.1 Source Data

The arc-flash study builds upon the results of the short circuit study and the coordination study in order to calculate the incident energy. Consequently, the arc flash study is completely dependent on the results of these two studies. When the short circuit study or coordination study are updated due to changes in the electrical distribution system, a revised arc flash study must be performed to ensure that the incident energy, PPE Level, and arc flash boundary at each piece of equipment are correctly calculated. The standard IEEE arcing current variation of 15% was incorporated to these scenarios representing utility fault current variation as well as other factors that affect arcing fault current.

## 4.2 Arc Flash Summary

Appendix D contains the worst-case results from all of the scenarios. Appendix D1 presents the results with the breaker settings as they were found in the field investigation, and Appendix D2 presents the results with the recommended breaker settings implemented. This summary shows both the inputs to and results of the incident energy calculations. Columns in the summary are as follows:

**Bus** - The location of the arcing fault.

**kV** - Bus voltage in kV.

**Configuration** - The name of the scenario which resulted in the worst case incident energy results.

**Energy (cal/cm<sup>2</sup>)** - The energy produced by the arcing fault experienced at the working distance of 18 inches.

**Arc Flash Boundary (ft)** - The distance from the arcing fault that results in an incident energy of 1.2 cal/cm<sup>2</sup>.

**PPE Level** - The level of personal protective equipment (PPE) required based on the calculated incident energy.

**Final FCT(sec)** - The amount of time it takes for a breaker to open once the trip has been initiated. Note that protective devices with an opening time of zero are those devices whose opening time is included in their characteristic curves on the TCC (e.g. thermal-magnetic molded-case circuit breakers).

**Ia at FCT (kA)** - Total symmetrical arcing fault current at the fault location for an arcing fault.

**Source Protective Device Name** - The name of the first protective device to clear the arcing fault.

**% Ia Variation** - Whether or not the worst case was caused when 15% IEEE 1584 current variation was used.

## 4.3 Arc Flash Hazard Mitigation Techniques

There is a variety of methods available to reduce arc flash hazards at specific pieces of equipment. Some potential mitigation methods are outlined below:

### 4.3.1 Zone Selective Interlocking

Zone Selective Interlocking (ZSI) is a coordination and protection strategy typically employed in low voltage switchgear. The goal of a well coordinated electrical system is for the breaker closest to the fault, to clear the fault, minimizing interruption to other parts of the



facility. In a ZSI system, the circuit breaker closest to a fault restrains or inhibits upstream breakers for a preset time delay before the upstream breaker is allowed to trip clearing the fault.

The goal of using ZSI is to allow for closer coordination between switchgear feeder, tie, and main circuit breakers. Reductions in the Long Time-Short Time-Ground Fault (LSG) settings of switchgear main and tie-breaker minimize equipment damage due to electrical faults. Use of ZSI also allows for activation of the instantaneous settings on the main breakers, which may reduce arc flash hazards in the switchgear itself.

#### **4.3.2 Maintenance Mode**

Some breakers and relays have the ability to store multiple settings for the same breaker. This functionality can be used for implementing a “maintenance mode” that can enable instantaneous and altering other settings to allow breakers to trip faster, reducing incident energy levels in equipment for personnel. Use of this “maintenance mode” may help to reduce Arc Flash hazards by up to 75% in some cases. Activation of the “maintenance mode” can be achieved in many ways, but common methods are by a manual or software selector switch or by occupancy sensor.

#### **4.3.3 Differential Relay**

A differential relay is a protection device used to monitor for fault scenarios within a defined zone of protection, often a switchgear bus or a transformer. The relay uses current transformers to monitor the current entering the zone of protection and exiting the zone of protection. When the amount of current entering and exiting the zone of protection is not equal, the relay will trip the associated circuit interrupter to clear the fault. This relay provides the ability to detect and clear a fault extremely quickly and reduces the incident energy level.

#### **4.3.4 Arc Flash Rated Equipment**

Arc flash rated equipment provides in a more robust enclosure that is designed to withstand the forces of an arc flash event and divert the pressure and gasses of the explosion out the top of the equipment using ducts. While the equipment does provide protection in the normal operating state of the equipment, it does not provide this additional protection when circuit breaker covers are open or removed.

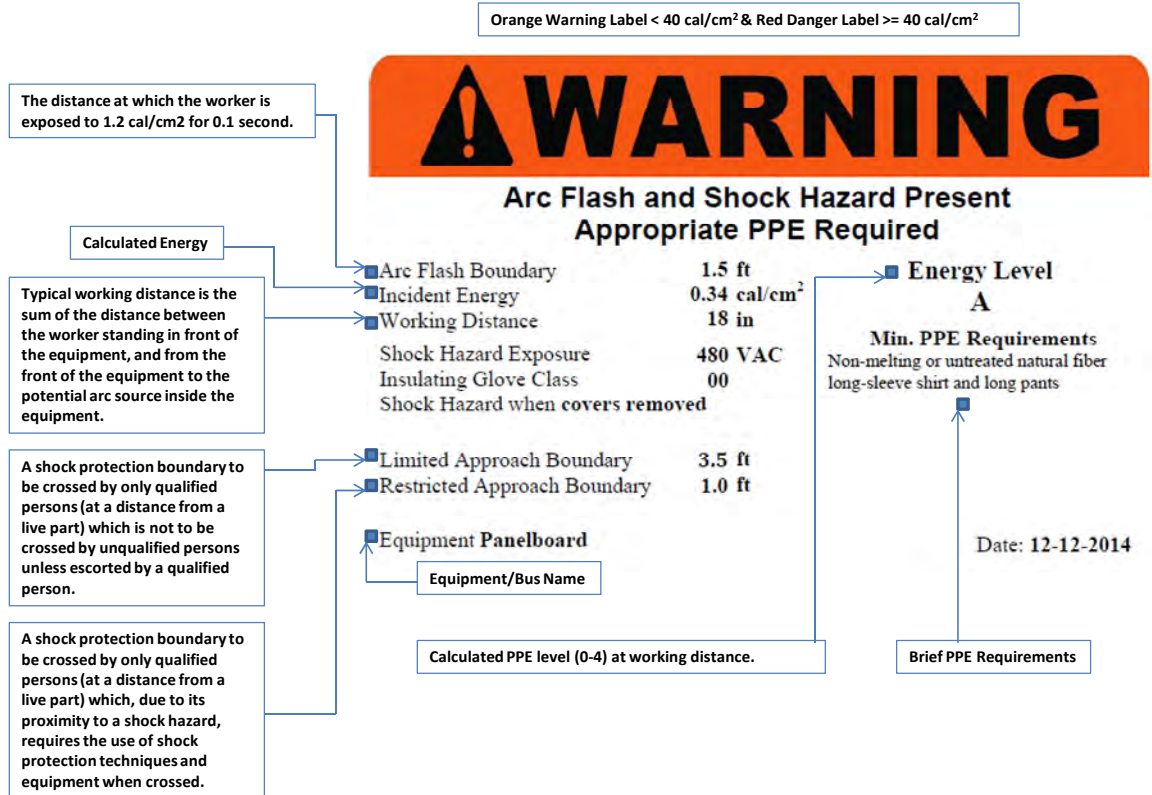
#### **4.3.5 Arc Flash Detection Relays**

A relatively new technology is available for retrofitting or equipping on new equipment that utilizes light and sound detection to sense an arc flash event. When the even is detected, the upstream protective device is actuated to interrupt and limit the incident energy at the associated equipment.

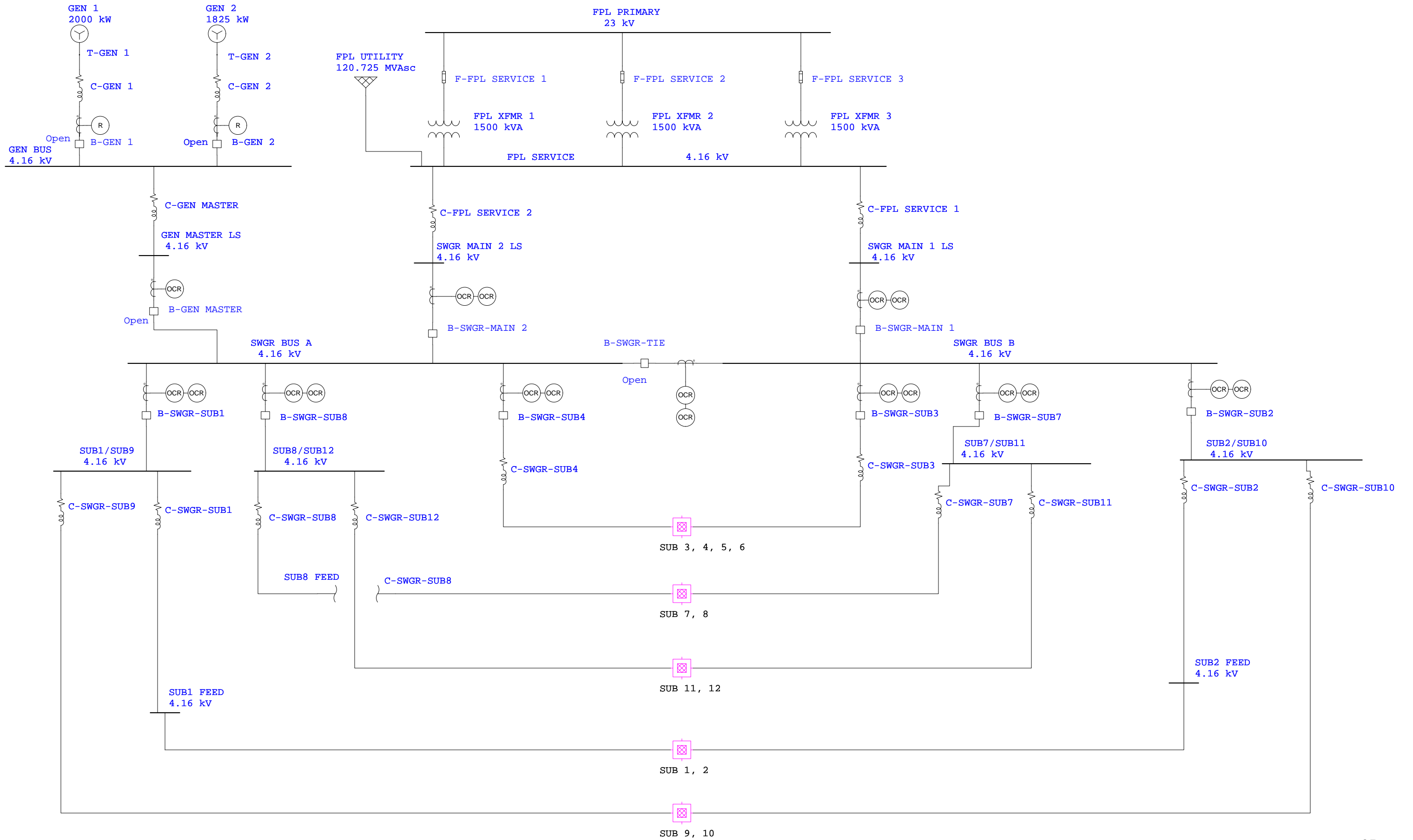
## 4.4 Arc Flash Hazard Labels

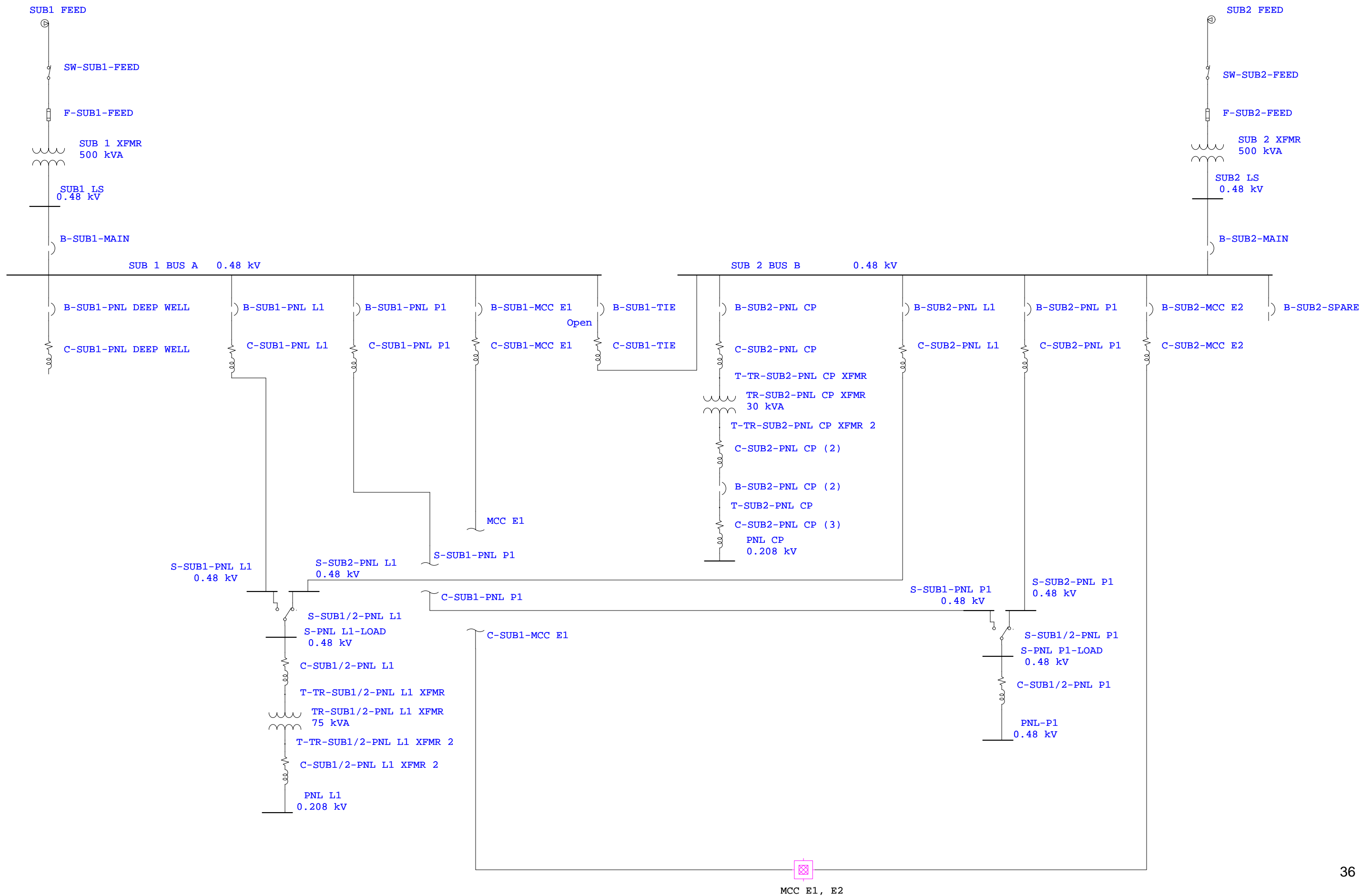
A sample arc flash label is attached for review. A complete set of labels suitable for direct application to equipment is provided as part of the final study for installation on the appropriate electrical equipment.

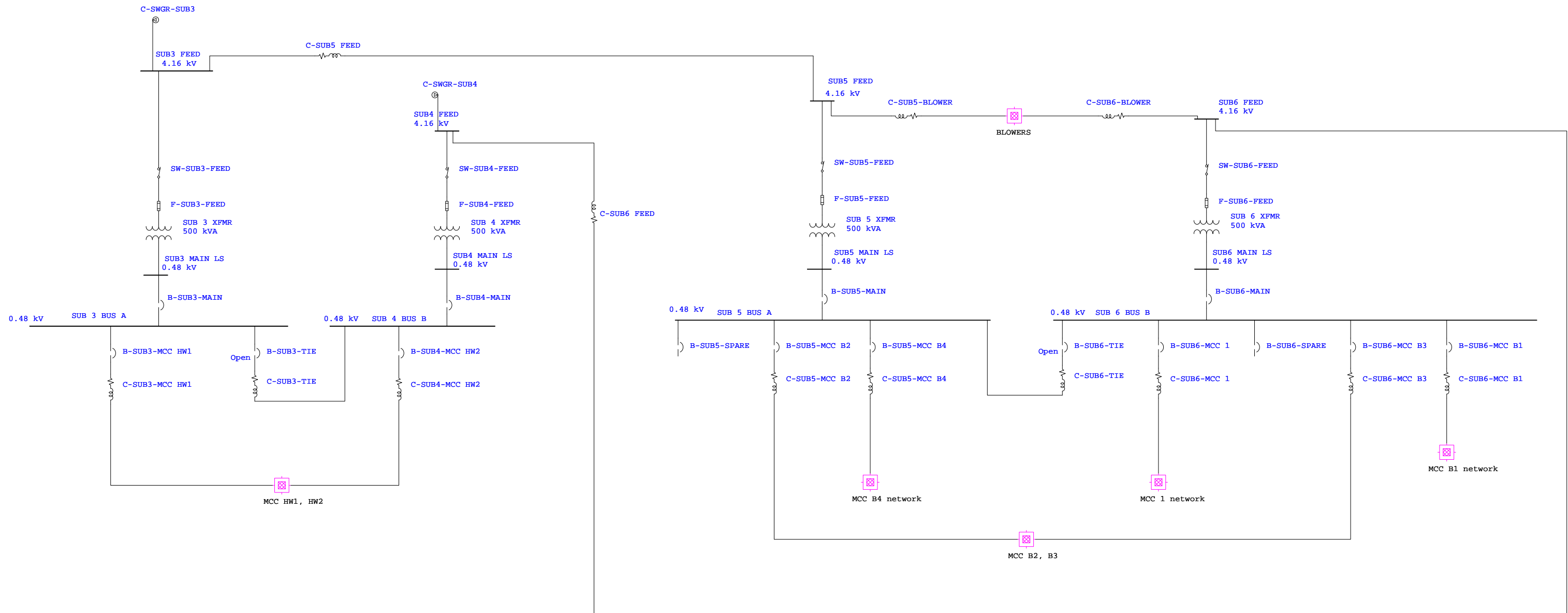
The arc flash hazard labels produced for this report are based on the assumption that the recommendations in the coordination study section of the report have been implemented.

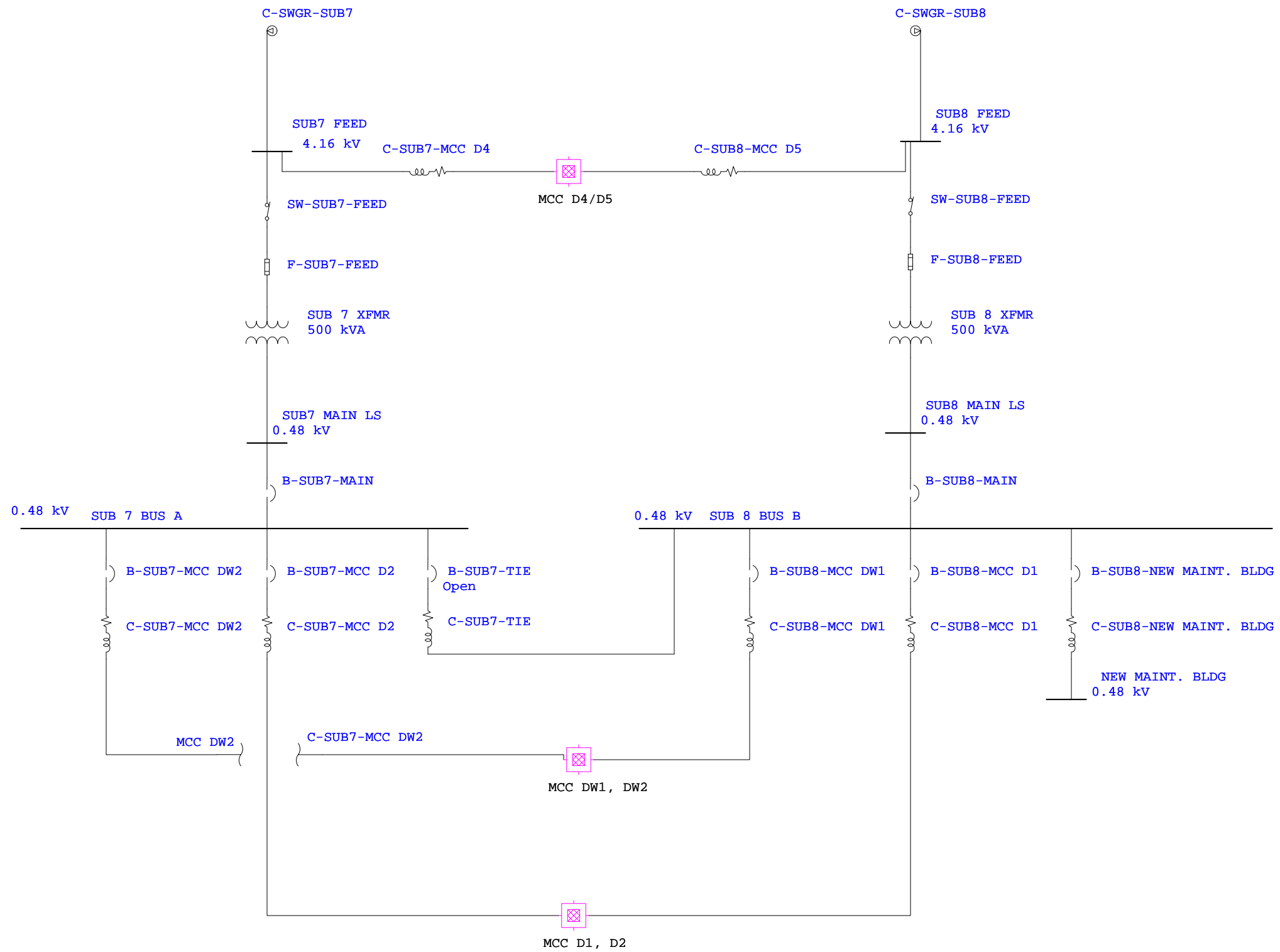


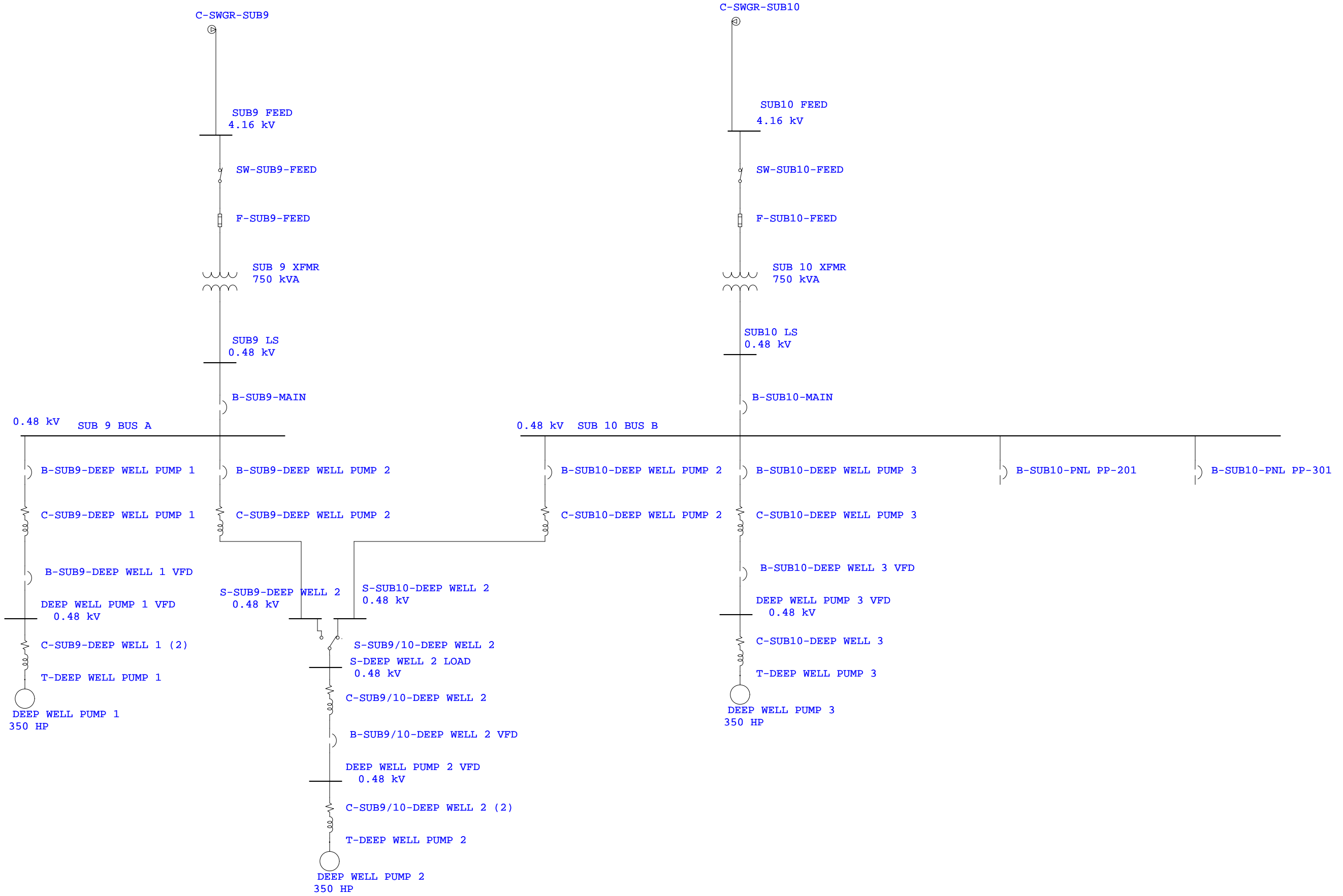




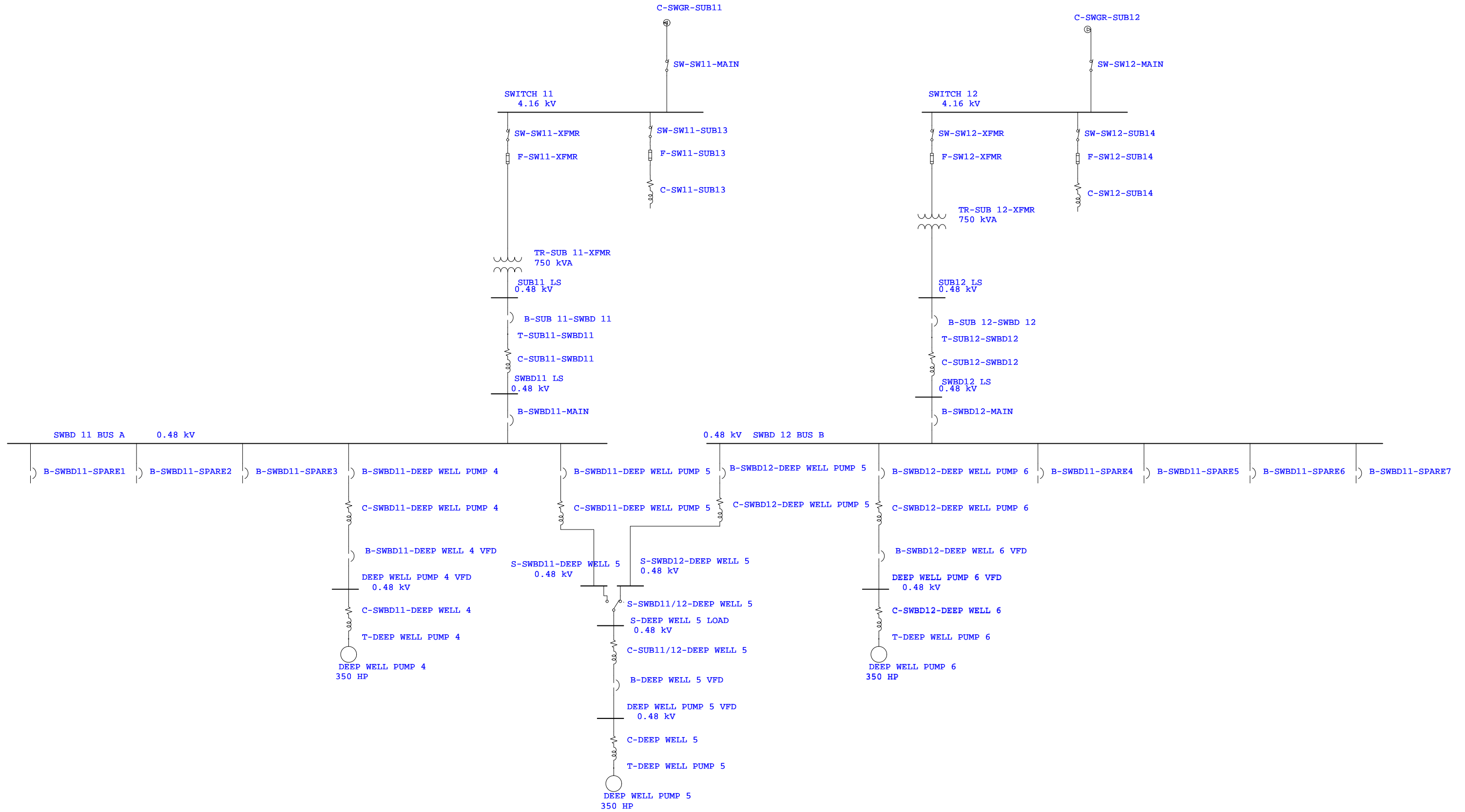


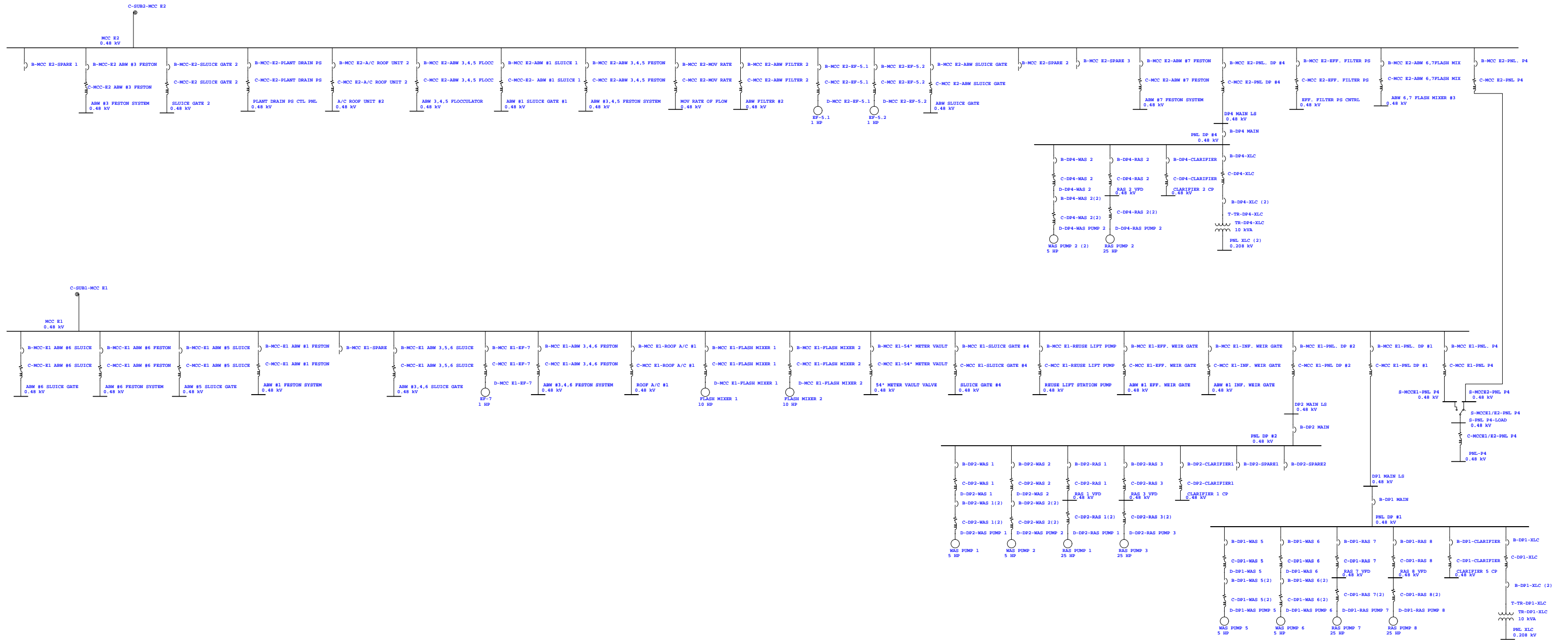


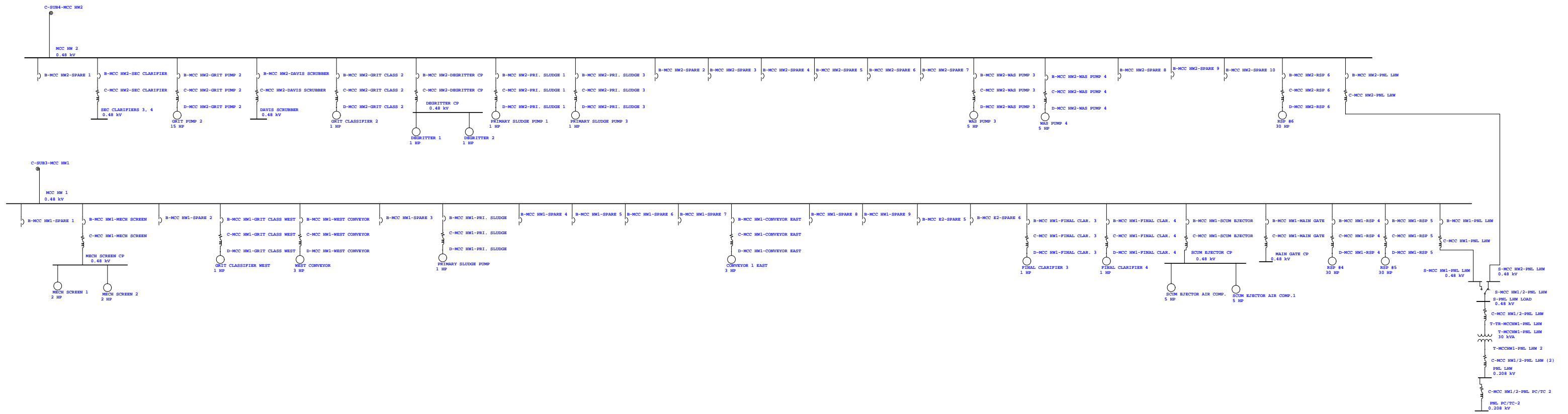


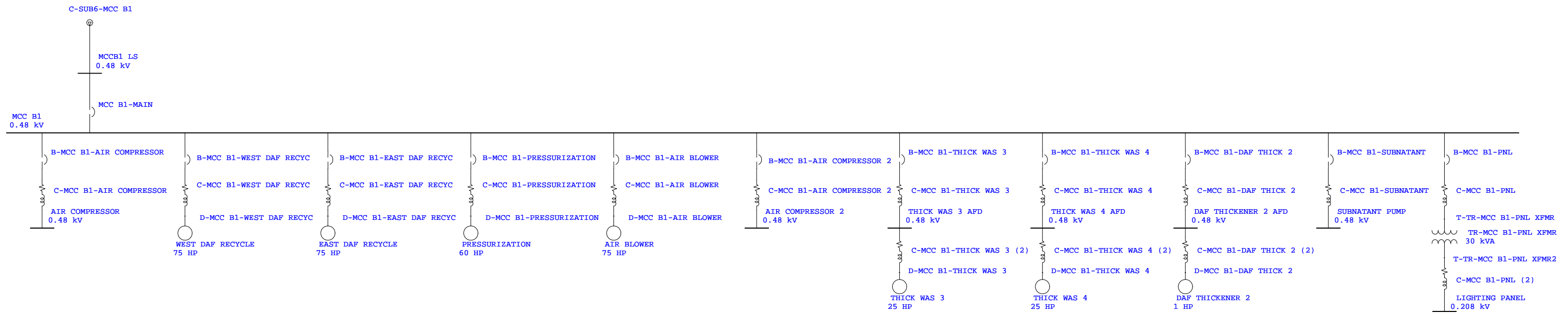


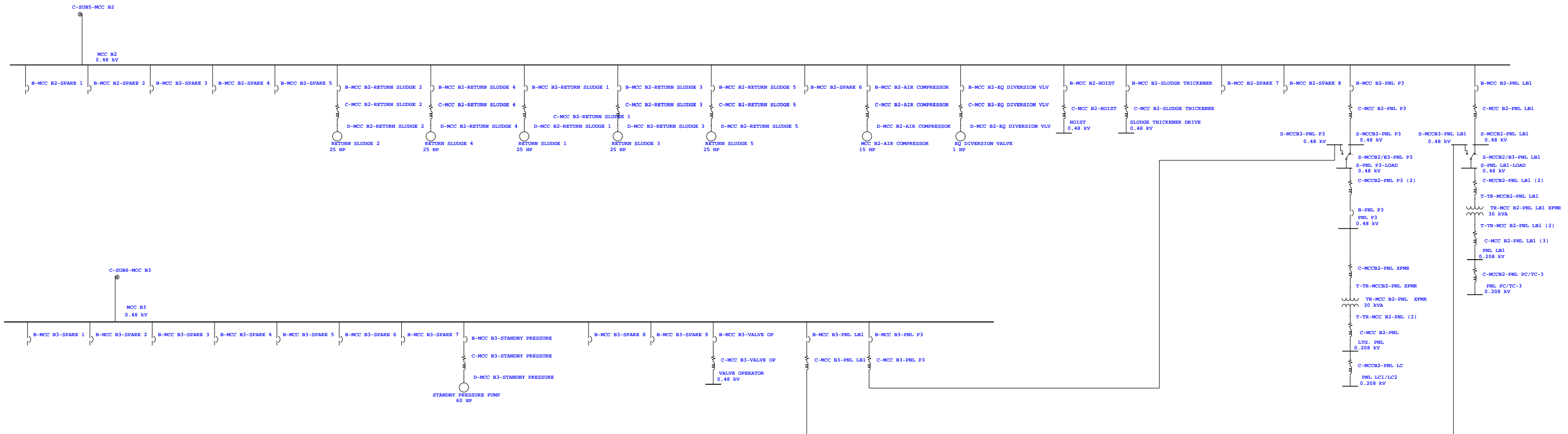


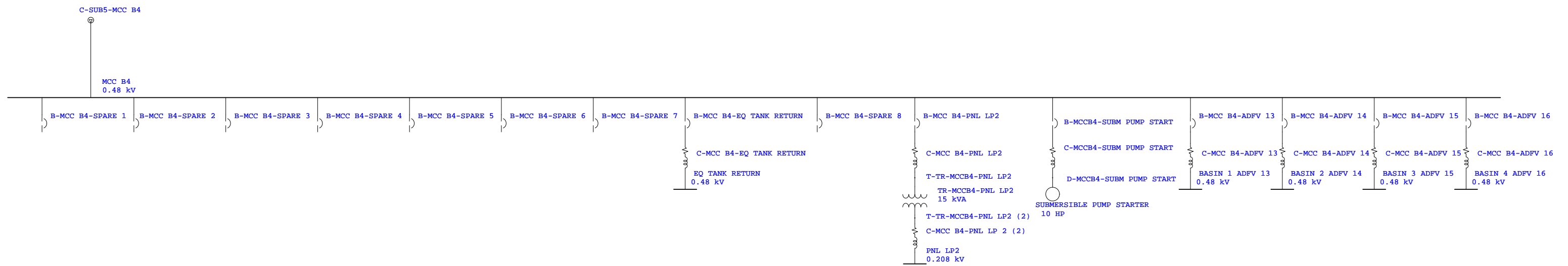


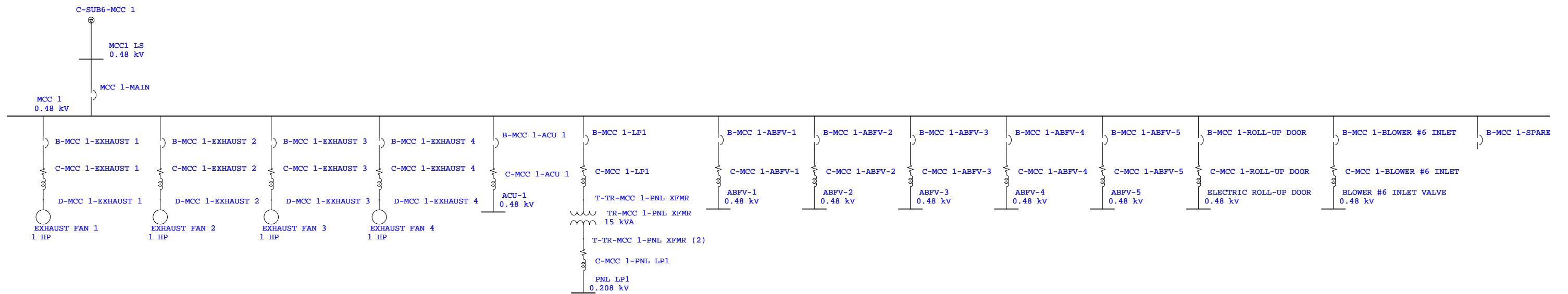


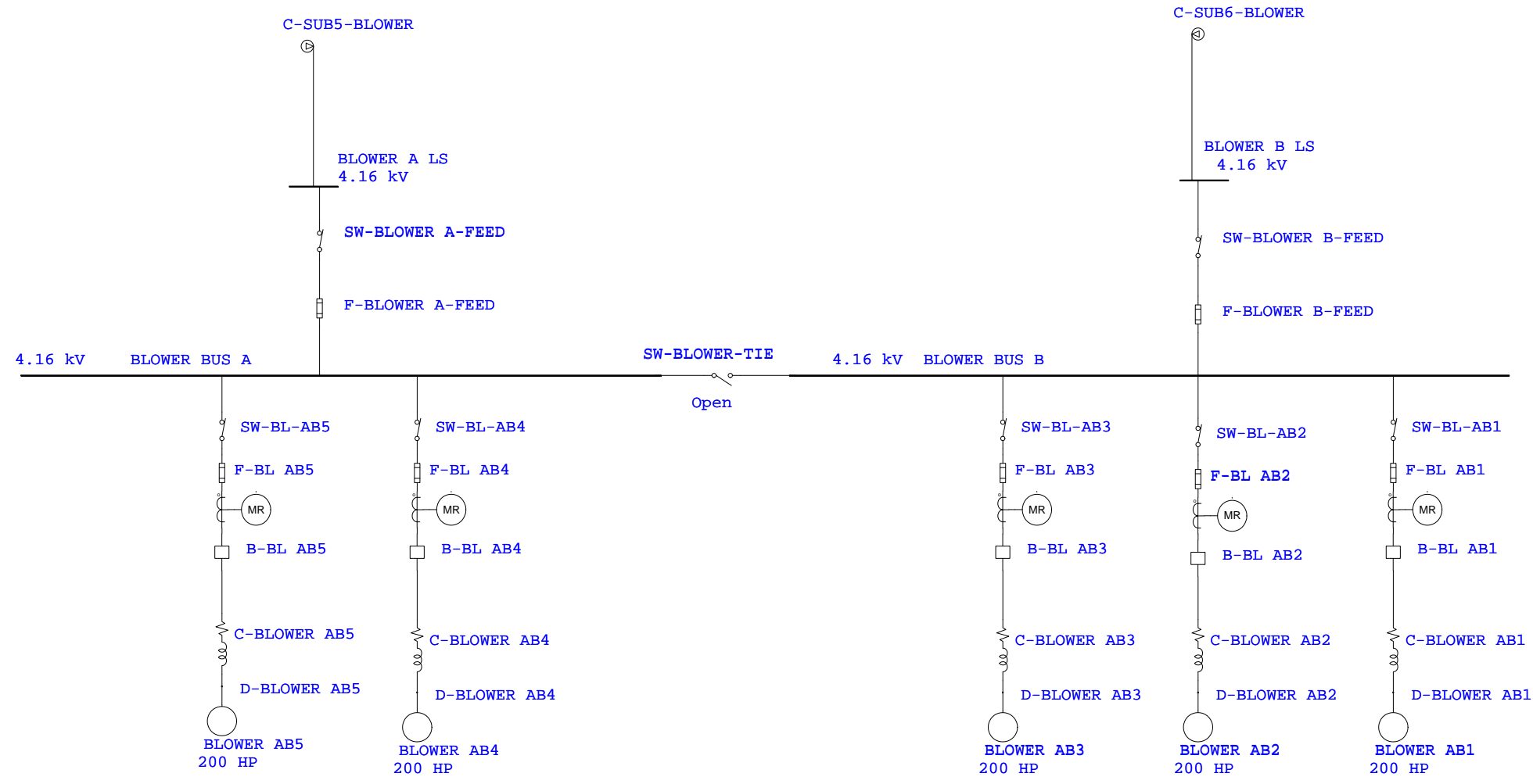




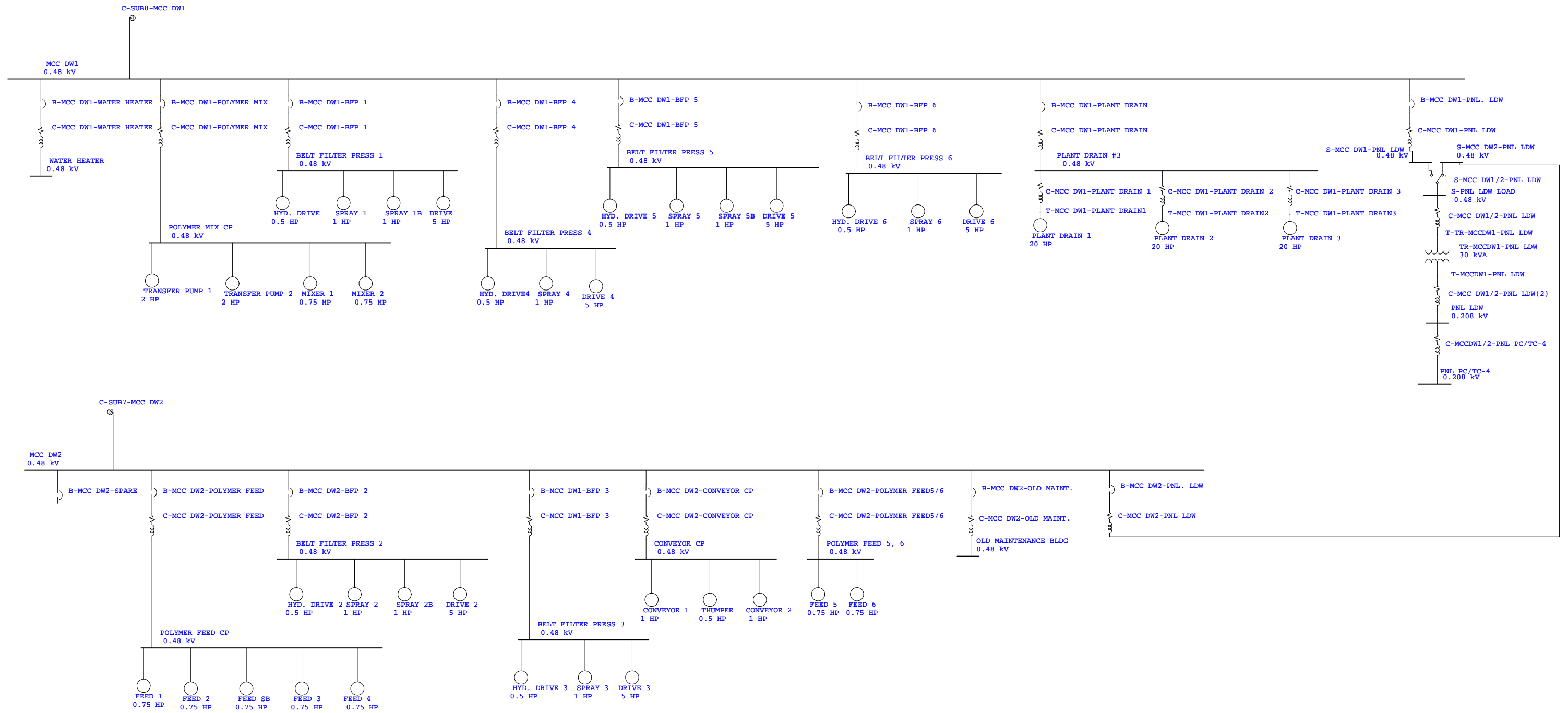




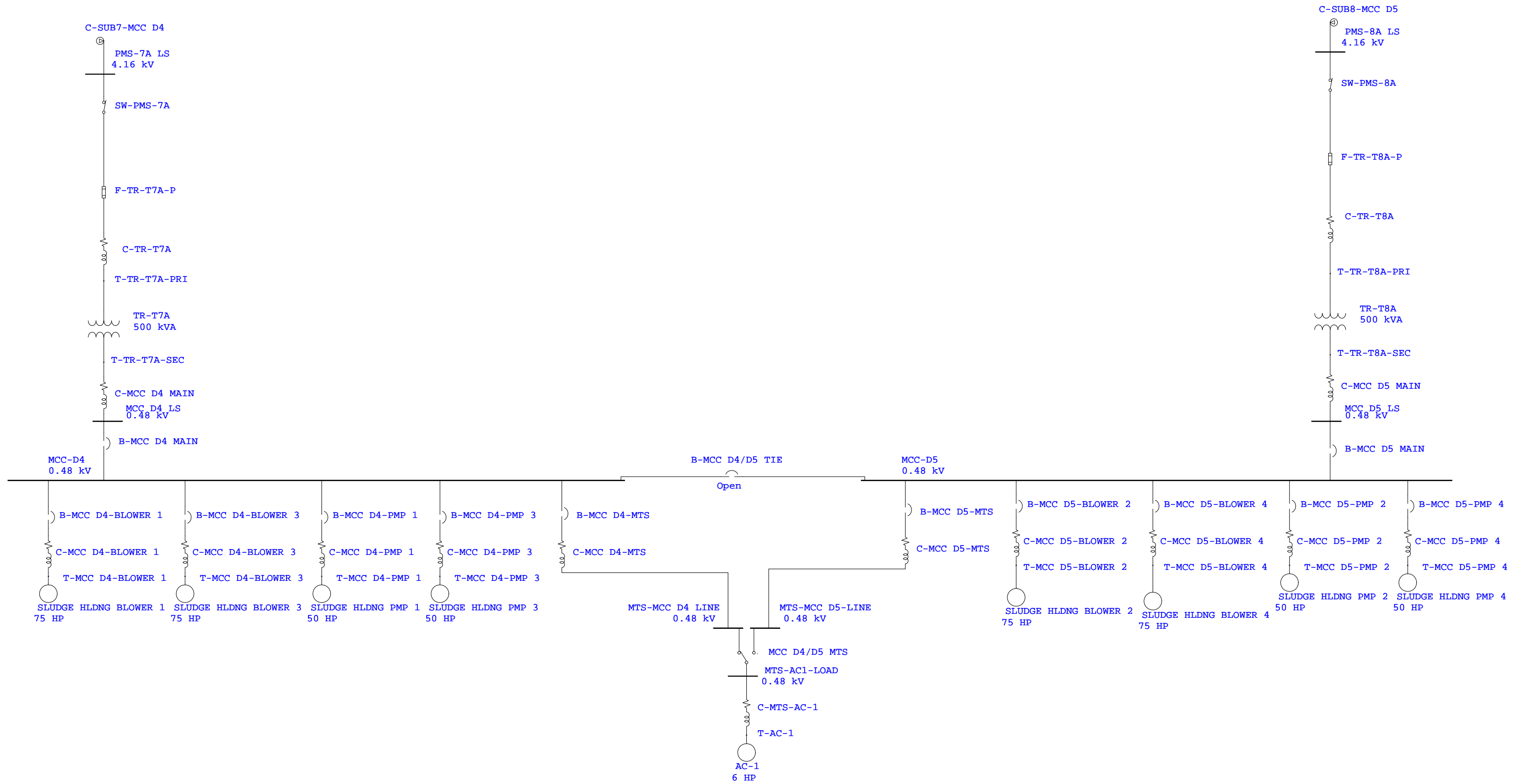












**APPENDIX B1 SHORT CIRCUIT STUDY  
(MOMENTARY DUTY SUMMARY REPORT)**

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: SWWRF

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 Revision: Base  
 Config.: Normal

**Momentary Duty Summary Report**

3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
54" METER VAULT VALVE	0.480	54" METER VAULT VALVE	Bus	0.938	0.1	1.000	0.938	1.326			
A/C ROOF UNIT #2	0.480	A/C ROOF UNIT #2	Bus	5.334	0.6	1.000	5.335	7.585			
ABFV-1	0.480	ABFV-1	Bus	4.569	0.6	1.000	4.569	6.507			
ABFV-2	0.480	ABFV-2	Bus	3.989	0.5	1.000	3.989	5.658			
ABFV-3	0.480	ABFV-3	Bus	3.527	0.5	1.000	3.527	4.994			
ABFV-4	0.480	ABFV-4	Bus	3.154	0.4	1.000	3.154	4.463			
ABFV-5	0.480	ABFV-5	Bus	2.848	0.4	1.000	2.848	4.029			
ABW #1 EFF. WEIR GATE	0.480	ABW #1 EFF. WEIR GATE	Bus	0.938	0.1	1.000	0.938	1.326			
ABW #1 FESTON SYSTEM	0.480	ABW #1 FESTON SYSTEM	Bus	2.247	0.3	1.000	2.247	3.178			
ABW #1 INF. WEIR GATE	0.480	ABW #1 INF. WEIR GATE	Bus	0.977	0.1	1.000	0.977	1.382			
ABW #1 SLUICE GATE #1	0.480	ABW #1 SLUICE GATE #1	Bus	0.594	0.1	1.000	0.594	0.840			
ABW #3 FESTON SYSTEM	0.480	ABW #3 FESTON SYSTEM	Bus	2.159	0.3	1.000	2.159	3.053			
ABW #3,4,5 FESTON SYSTEM	0.480	ABW #3,4,5 FESTON SYSTEM	Bus	1.309	0.2	1.000	1.309	1.852			
ABW 3,4,5 FLOCCULATOR	0.480	ABW 3,4,5 FLOCCULATOR	Bus	0.569	0.1	1.000	0.569	0.805			
ABW #3,4,6 FESTON SYSTEM	0.480	ABW #3,4,6 FESTON SYSTEM	Bus	1.360	0.2	1.000	1.360	1.923			
ABW #3,4,6 SLUICE GATE	0.480	ABW #3,4,6 SLUICE GATE	Bus	0.867	0.1	1.000	0.867	1.227			
ABW #5 SLUICE GATE	0.480	ABW #5 SLUICE GATE	Bus	0.938	0.1	1.000	0.938	1.326			
ABW #6 FESTON SYSTEM	0.480	ABW #6 FESTON SYSTEM	Bus	2.162	0.3	1.000	2.162	3.057			
ABW #6 SLUICE GATE	0.480	ABW #6 SLUICE GATE	Bus	0.901	0.1	1.000	0.901	1.274			
ABW 6,7 FLASH MIXER #3	0.480	ABW 6,7 FLASH MIXER #3	Bus	0.807	0.1	1.000	0.807	1.141			
ABW #7 FESTON SYSTEM	0.480	ABW #7 FESTON SYSTEM	Bus	1.938	0.3	1.000	1.938	2.740			
ABW FILTER #2	0.480	ABW FILTER #2	Bus	2.080	0.3	1.000	2.080	2.941			
ABW SLUICE GATE	0.480	ABW SLUICE GATE	Bus	0.569	0.1	1.000	0.569	0.805			
ACU-1	0.480	ACU-1	Bus	6.498	1.2	1.005	6.532	9.851			
AFD-MCC D1-THICKENER	0.480	AFD-MCC D1-THICKENER	Bus	6.748	0.9	1.001	6.755	9.841			
AIR COMPRESSOR	0.480	AIR COMPRESSOR	Bus	9.308	0.9	1.001	9.317	13.566			
AIR COMPRESSOR 2	0.480	AIR COMPRESSOR 2	Bus	8.838	0.8	1.001	8.843	12.788			
BASIN 1 ADFV 13	0.480	BASIN 1 ADFV 13	Bus	2.814	0.3	1.000	2.814	3.979			
BASIN 2 ADFV 14	0.480	BASIN 2 ADFV 14	Bus	2.269	0.2	1.000	2.269	3.209			
BASIN 3 ADFV 15	0.480	BASIN 3 ADFV 15	Bus	1.790	0.2	1.000	1.790	2.532			
BASIN 4 ADFV 16	0.480	BASIN 4 ADFV 16	Bus	1.477	0.2	1.000	1.477	2.089			
BELT FILTER PRESS 1	0.480	BELT FILTER PRESS 1	Bus	6.170	0.7	1.000	6.171	8.805			
BELT FILTER PRESS 2	0.480	BELT FILTER PRESS 2	Bus	6.105	0.7	1.000	6.105	8.720			
BELT FILTER PRESS 3	0.480	BELT FILTER PRESS 3	Bus	7.105	0.8	1.000	7.108	10.262			

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
BELT FILTER PRESS 4	0.480	BELT FILTER PRESS 4	Bus	7.203	0.8	1.000	7.205	10.383			
BELT FILTER PRESS 5	0.480	BELT FILTER PRESS 5	Bus	8.560	1.0	1.002	8.577	12.644			
BELT FILTER PRESS 6	0.480	BELT FILTER PRESS 6	Bus	8.556	1.0	1.002	8.573	12.639			
BLOWER #6 INLET VALVE	0.480	BLOWER #6 INLET VALVE	Bus	7.261	1.5	1.014	7.360	11.468			
BLOWER A LS	4.160	BLOWER A LS	MCC	9.697	2.7	1.096	10.624	18.053		58.000	97.880
	4.160	SW-BLOWER A-FEED	SPST Switch	9.697	2.7	1.096	10.624	18.053		40.000	0.000
BLOWER B LS	4.160	BLOWER B LS	MCC	9.817	2.9	1.106	10.861	18.530		58.000	97.880
	4.160	SW-BLOWER B-FEED	SPST Switch	9.817	2.9	1.106	10.861	18.530		40.000	0.000
BLOWER BUS A	4.160	BLOWER BUS A	MCC	9.697	2.7	1.096	10.624	18.053		58.000	97.880
	4.160	SW-BLOWER A-FEED	SPST Switch	9.697	2.7	1.096	10.624	18.053		40.000	0.000
BLOWER BUS B	4.160	BLOWER BUS B	MCC	9.817	2.9	1.106	10.861	18.530		58.000	97.880
	4.160	SW-BLOWER B-FEED	SPST Switch	9.817	2.9	1.106	10.861	18.530		40.000	0.000
CLARIFIER 1 CP	0.480	CLARIFIER 1 CP	Bus	1.495	0.2	1.000	1.495	2.115			
CLARIFIER 2 CP	0.480	CLARIFIER 2 CP	Bus	1.503	0.2	1.000	1.503	2.126			
CLARIFIER 5 CP	0.480	CLARIFIER 5 CP	Bus	1.493	0.2	1.000	1.493	2.111			
CONVEYOR CP	0.480	CONVEYOR CP	Bus	4.750	0.5	1.000	4.750	6.727			
D-DP1-RAS PUMP 7	0.480	D-DP1-RAS PUMP 7	Open Air	6.425	1.1	1.004	6.452	9.672	10.000	12.500	
D-DP1-RAS PUMP 8	0.480	D-DP1-RAS PUMP 8	Open Air	6.425	1.1	1.004	6.452	9.672	10.000	12.500	
D-DP1-WAS 5	0.480	D-DP1-WAS 5	Bus	6.171	0.9	1.001	6.177	8.984			
D-DP1-WAS 6	0.480	D-DP1-WAS 6	Bus	6.171	0.9	1.001	6.177	8.984			
D-DP2-RAS PUMP 1	0.480	D-DP2-RAS PUMP 1	Open Air	5.493	0.9	1.001	5.499	8.034	10.000	12.500	
D-DP2-RAS PUMP 3	0.480	D-DP2-RAS PUMP 3	Open Air	5.493	0.9	1.001	5.499	8.034	10.000	12.500	
D-DP2-WAS 1	0.480	D-DP2-WAS 1	Bus	6.220	0.9	1.001	6.225	9.053			
D-DP2-WAS 2	0.480	D-DP2-WAS 2	Bus	6.220	0.9	1.001	6.225	9.053			
D-DP4-RAS PUMP 2	0.480	D-DP4-RAS PUMP 2	Open Air	6.894	1.3	1.009	6.956	10.679	10.000	12.500	
D-DP4-WAS 2	0.480	D-DP4-WAS 2	Bus	6.273	0.9	1.001	6.281	9.187			
D-DP4-WAS PUMP 2	0.480	D-DP4-WAS PUMP 2	Open Air	2.851	0.4	1.000	2.851	4.032	10.000	12.500	
D-MCC 1-EXHAUST 1	0.480	D-MCC 1-EXHAUST 1	Open Air	2.852	0.4	1.000	2.852	4.034	10.000	12.500	
D-MCC 1-EXHAUST 2	0.480	D-MCC 1-EXHAUST 2	Open Air	2.852	0.4	1.000	2.852	4.034	10.000	12.500	
D-MCC 1-EXHAUST 3	0.480	D-MCC 1-EXHAUST 3	Open Air	2.852	0.4	1.000	2.852	4.034	10.000	12.500	
D-MCC 1-EXHAUST 4	0.480	D-MCC 1-EXHAUST 4	Open Air	2.852	0.4	1.000	2.852	4.034	10.000	12.500	
D-MCC B1-AIR BLOWER	0.480	D-MCC B1-AIR BLOWER	Open Air	11.596	1.9	1.034	11.988	19.439	10.000 *	12.500	
D-MCC B1-DAF THICK 2	0.480	D-MCC B1-DAF THICK 2	Open Air	3.012	0.2	1.000	3.012	4.260	10.000	12.500	
D-MCC B1-EAST DAF RECYC	0.480	D-MCC B1-EAST DAF RECYC	Open Air	11.257	1.8	1.028	11.575	18.615	10.000 *	12.500	
D-MCC B1-PRESSURIZATION	0.480	D-MCC B1-PRESSURIZATION	Open Air	9.179	1.3	1.008	9.251	14.133	10.000	12.500	
D-MCC B1-THICK WAS 3	0.480	D-MCC B1-THICK WAS 3	Open Air	9.579	1.2	1.006	9.640	14.632	10.000	12.500	

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 Revision: Base  
 Config.: Normal

3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
D-MCC B1-THICK WAS 4	0.480	D-MCC B1-THICK WAS 4	Open Air	9.579	1.2	1.006	9.640	14.632	10.000	12.500	
<b>D-MCC B1-WEST DAF RECYC</b>	<b>0.480</b>	<b>D-MCC B1-WEST DAF RECYC</b>	Open Air	<b>11.257</b>	<b>1.8</b>	<b>1.028</b>	<b>11.575</b>	<b>18.615</b>	<b>10.000 *</b>	<b>12.500</b>	
D-MCC B2-AIR COMPRESSOR	0.480	D-MCC B2-AIR COMPRESSOR	Open Air	6.615	0.7	1.000	6.616	9.473	10.000	12.500	
D-MCC B2-EQ DIVERSION VLV	0.480	D-MCC B2-EQ DIVERSION VLV	Open Air	2.831	0.2	1.000	2.831	4.004	10.000	12.500	
D-MCC B2-RETURN SLUDGE 1	0.480	D-MCC B2-RETURN SLUDGE 1	Open Air	4.348	0.5	1.000	4.348	6.156	10.000	12.500	
D-MCC B2-RETURN SLUDGE 2	0.480	D-MCC B2-RETURN SLUDGE 2	Open Air	5.603	0.6	1.000	5.604	7.958	10.000	12.500	
D-MCC B2-RETURN SLUDGE 3	0.480	D-MCC B2-RETURN SLUDGE 3	Open Air	4.901	0.5	1.000	4.901	6.946	10.000	12.500	
D-MCC B2-RETURN SLUDGE 4	0.480	D-MCC B2-RETURN SLUDGE 4	Open Air	4.901	0.5	1.000	4.901	6.946	10.000	12.500	
D-MCC B2-RETURN SLUDGE 5	0.480	D-MCC B2-RETURN SLUDGE 5	Open Air	4.348	0.5	1.000	4.348	6.156	10.000	12.500	
<b>D-MCC B3-STANDBY PRESSURE</b>	<b>0.480</b>	<b>D-MCC B3-STANDBY PRESSURE</b>	Open Air	<b>10.033</b>	<b>1.5</b>	<b>1.014</b>	<b>10.177</b>	<b>15.896</b>	<b>10.000 *</b>	<b>12.500</b>	
D-MCC D1-BFP FEED PUMP	0.480	D-MCC D1-BFP FEED PUMP	Open Air	3.644	0.4	1.000	3.644	5.157	10.000	12.500	
D-MCC D1-BFP FEED PUMP5	0.480	D-MCC D1-BFP FEED PUMP5	Open Air	3.861	0.5	1.000	3.861	5.470	10.000	12.500	
D-MCC D1-GRAVITY THICK	0.480	D-MCC D1-GRAVITY THICK	Open Air	1.805	0.2	1.000	1.805	2.553	10.000	12.500	
D-MCC D1-SLUDGE RECIRC 1	0.480	D-MCC D1-SLUDGE RECIRC 1	Open Air	6.026	0.9	1.001	6.030	8.752	10.000	12.500	
D-MCC D1-SLUDGE RECIRC 3	0.480	D-MCC D1-SLUDGE RECIRC 3	Open Air	5.527	0.8	1.000	5.529	7.956	10.000	12.500	
D-MCC D1-SLUDGE RECIRC 4	0.480	D-MCC D1-SLUDGE RECIRC 4	Open Air	5.093	0.7	1.000	5.094	7.290	10.000	12.500	
D-MCC D1-SLUDGE TRANSFER1	0.480	D-MCC D1-SLUDGE TRANSFER1	Open Air	6.609	1.0	1.002	6.622	9.748	10.000	12.500	
D-MCC D1-THICKENER	0.480	D-MCC D1-THICKENER	Open Air	1.818	0.2	1.000	1.818	2.570	10.000	12.500	
D-MCC D2-BFP FEED PUMP1	0.480	D-MCC D2-BFP FEED PUMP1	Open Air	4.595	0.6	1.000	4.595	6.527	10.000	12.500	
D-MCC D2-BFP FEED PUMP4	0.480	D-MCC D2-BFP FEED PUMP4	Open Air	3.373	0.4	1.000	3.373	4.773	10.000	12.500	
D-MCC D2-BFP FEED PUMP6	0.480	D-MCC D2-BFP FEED PUMP6	Open Air	2.967	0.4	1.000	2.967	4.198	10.000	12.500	
D-MCC D2-SLUDGE RECIRC 2	0.480	D-MCC D2-SLUDGE RECIRC 2	Open Air	4.488	0.6	1.000	4.489	6.380	10.000	12.500	
D-MCC D2-SLUDGE TRANSFER2	0.480	D-MCC D2-SLUDGE TRANSFER2	Open Air	1.925	0.3	1.000	1.925	2.722	10.000	12.500	
D-MCC D2-SLUDGE TRANSFER3	0.480	D-MCC D2-SLUDGE TRANSFER3	Open Air	4.042	0.5	1.000	4.042	5.734	10.000	12.500	
D-MCC D2-SLUDGE TRANSFER4	0.480	D-MCC D2-SLUDGE TRANSFER4	Open Air	6.722	1.0	1.002	6.733	9.878	10.000	12.500	
D-MCC DW1-PLANT DRAIN1	0.480	D-MCC DW1-PLANT DRAIN1	Open Air	2.222	0.3	1.000	2.222	3.142	10.000	12.500	
D-MCC DW1-PLANT DRAIN2	0.480	D-MCC DW1-PLANT DRAIN2	Open Air	2.222	0.3	1.000	2.222	3.142	10.000	12.500	
D-MCC DW1-PLANT DRAIN3	0.480	D-MCC DW1-PLANT DRAIN3	Open Air	2.222	0.3	1.000	2.222	3.142	10.000	12.500	
D-MCC E1-EF-7	0.480	D-MCC E1-EF-7	Open Air	2.653	0.3	1.000	2.653	3.751	10.000	12.500	
D-MCC E1-FLASH MIXER 1	0.480	D-MCC E1-FLASH MIXER 1	Open Air	0.530	0.1	1.000	0.530	0.750	10.000	12.500	
D-MCC E1-FLASH MIXER 2	0.480	D-MCC E1-FLASH MIXER 2	Open Air	0.892	0.1	1.000	0.892	1.261	10.000	12.500	

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
D-MCC E2-EF-5.1	0.480	D-MCC E2-EF-5.1	Open Air	1.658	0.2	1.000	1.658	2.345	10.000	12.500	
D-MCC E2-EF-5.2	0.480	D-MCC E2-EF-5.2	Open Air	1.658	0.2	1.000	1.658	2.345	10.000	12.500	
D-MCC HW1-CONVEYOR EAST	0.480	D-MCC HW1-CONVEYOR EAST	Open Air	4.028	0.4	1.000	4.028	5.697	10.000	12.500	
D-MCC HW1-FINAL CLAR. 3	0.480	D-MCC HW1-FINAL CLAR. 3	Open Air	0.269	0.0	1.000	0.269	0.380	10.000	12.500	
D-MCC HW1-FINAL CLAR. 4	0.480	D-MCC HW1-FINAL CLAR. 4	Open Air	0.273	0.0	1.000	0.273	0.386	10.000	12.500	
D-MCC HW1-GRIT CLASS WEST	0.480	D-MCC HW1-GRIT CLASS WEST	Open Air	1.227	0.1	1.000	1.227	1.735	10.000	12.500	
D-MCC HW1-PRI. SLUDGE	0.480	D-MCC HW1-PRI. SLUDGE	Open Air	0.385	0.1	1.000	0.385	0.544	10.000	12.500	
D-MCC HW1-RSP 4	0.480	D-MCC HW1-RSP 4	Open Air	4.237	0.7	1.000	4.238	6.056	10.000	12.500	
D-MCC HW1-RSP 5	0.480	D-MCC HW1-RSP 5	Open Air	4.237	0.7	1.000	4.238	6.056	10.000	12.500	
D-MCC HW1-WEST CONVEYOR	0.480	D-MCC HW1-WEST CONVEYOR	Open Air	1.182	0.1	1.000	1.182	1.671	10.000	12.500	
D-MCC HW2-GRIT CLASS 2	0.480	D-MCC HW2-GRIT CLASS 2	Open Air	1.883	0.2	1.000	1.883	2.664	10.000	12.500	
D-MCC HW2-GRIT PUMP 2	0.480	D-MCC HW2-GRIT PUMP 2	Open Air	3.462	0.3	1.000	3.462	4.896	10.000	12.500	
D-MCC HW2-PRI. SLUDGE 1	0.480	D-MCC HW2-PRI. SLUDGE 1	Open Air	0.530	0.1	1.000	0.530	0.749	10.000	12.500	
D-MCC HW2-PRI. SLUDGE 3	0.480	D-MCC HW2-PRI. SLUDGE 3	Open Air	0.530	0.1	1.000	0.530	0.749	10.000	12.500	
D-MCC HW2-RSP 6	0.480	D-MCC HW2-RSP 6	Open Air	4.202	0.7	1.000	4.202	6.009	10.000	12.500	
D-MCC HW2-WAS PUMP 3	0.480	D-MCC HW2-WAS PUMP 3	Open Air	0.851	0.1	1.000	0.851	1.204	10.000	12.500	
D-MCC HW2-WAS PUMP 4	0.480	D-MCC HW2-WAS PUMP 4	Open Air	0.851	0.1	1.000	0.851	1.204	10.000	12.500	
D-MCCB4-SUBM PUMP START	0.480	D-MCCB4-SUBM PUMP START	Open Air	2.230	0.3	1.000	2.230	3.153	10.000	12.500	
DAF THICKENER 2 AFD	0.480	DAF THICKENER 2 AFD	Bus	7.847	0.7	1.000	7.848	11.188			
DAVIS SCRUBBER	0.480	DAVIS SCRUBBER	Bus	8.341	1.2	1.006	8.388	12.681			
DEEP WELL PUMP 1 VFD	0.480	DEEP WELL PUMP 1 VFD	Bus	15.166	4.9	1.246	18.892	32.714			
DEEP WELL PUMP 2 VFD	0.480	DEEP WELL PUMP 2 VFD	Bus	16.163	4.7	1.233	19.926	34.512			
DEEP WELL PUMP 3 VFD	0.480	DEEP WELL PUMP 3 VFD	Bus	17.061	5.2	1.262	21.531	37.262			
DEEP WELL PUMP 4 VFD	0.480	DEEP WELL PUMP 4 VFD	Bus	13.991	4.1	1.194	16.711	28.925			
DEEP WELL PUMP 5 VFD	0.480	DEEP WELL PUMP 5 VFD	Bus	15.450	4.3	1.208	18.659	32.312			
DEEP WELL PUMP 6 VFD	0.480	DEEP WELL PUMP 6 VFD	Bus	15.749	4.4	1.215	19.132	33.136			
DEGRITTER CP	0.480	DEGRITTER CP	Panelboard	2.997	0.3	1.000	2.997	4.238	50.000	62.300	
DP1 MAIN LS	0.480	DP1 MAIN LS	Bus	8.611	2.1	1.052	9.058	14.990			
DP2 MAIN LS	0.480	DP2 MAIN LS	Bus	8.699	2.2	1.053	9.164	15.183			
DP4 MAIN LS	0.480	DP4 MAIN LS	Bus	8.651	2.4	1.071	9.267	15.558			
EFF. FILTER PS CNTRL	0.480	EFF. FILTER PS CNTRL	Bus	8.447	2.0	1.041	8.796	14.399			
ELECTRIC ROLL-UP DOOR	0.480	ELECTRIC ROLL-UP DOOR	Bus	3.527	0.5	1.000	3.527	4.994			
EQ TANK RETURN	0.480	EQ TANK RETURN	Bus	2.569	0.2	1.000	2.569	3.633			
FPL PRIMARY	23.000	FPL PRIMARY	Bus	1.359	8.3	1.391	1.891	3.236			
FPL SERVICE	4.160	FPL SERVICE	Cable Bus	19.426	11.2	1.464	28.431	48.232		58.000	97.880



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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
HOIST	0.480	HOIST	Bus	7.134	0.7	1.000	7.135	10.187			
LIGHTING PANEL	0.208	LIGHTING PANEL	Panelboard	1.593	1.3	1.007	1.604	2.441	50.000	62.300	
LTG. PNL	0.208	LTG. PNL	Panelboard	1.902	1.6	1.018	1.936	3.051	50.000	62.300	
MAIN GATE CP	0.480	MAIN GATE CP	Panelboard	0.755	0.1	1.000	0.755	1.068	50.000	62.300	
MCC 1	0.480	MCC 1	MCC	7.303	1.5	1.015	7.409	11.576	65.000	81.100	
MCC B1	0.480	MCC B1	MCC	14.601	4.1	1.198	17.490	30.278	42.000	52.400	
MCC B2	0.480	MCC B2	MCC	13.194	4.0	1.189	15.686	27.143	42.000	52.400	
MCC B3	0.480	MCC B3	MCC	14.155	3.8	1.178	16.678	28.839	42.000	52.400	
MCC B4	0.480	MCC B4	MCC	13.141	4.0	1.187	15.602	26.994	42.000	52.400	
MCC D1	0.480	MCC D1	MCC	9.597	2.6	1.083	10.390	17.552	42.000	52.400	
MCC D2	0.480	MCC D2	MCC	9.311	2.6	1.084	10.094	17.064	42.000	52.400	
MCC D4 LS	0.480	MCC D4 LS	Bus	12.449	3.7	1.171	14.577	25.188			
MCC D5 LS	0.480	MCC D5 LS	Bus	12.422	3.7	1.170	14.539	25.122			
MCC DW1	0.480	MCC DW1	MCC	12.859	3.7	1.166	14.999	25.906	42.000	52.400	
MCC DW2	0.480	MCC DW2	MCC	12.450	3.7	1.169	14.553	25.142	42.000	52.400	
MCC E1	0.480	MCC E1	MCC	12.795	4.0	1.188	15.198	26.296	42.000	52.400	
MCC E2	0.480	MCC E2	MCC	12.434	4.1	1.195	14.862	25.726	42.000	52.400	
MCC HW 1	0.480	MCC HW 1	MCC	13.190	4.3	1.208	15.929	27.584	42.000	52.400	
MCC HW 2	0.480	MCC HW 2	MCC	12.778	4.1	1.199	15.318	26.518	42.000	52.400	
MCC-D4	0.480	MCC-D4	MCC	12.449	3.7	1.171	14.577	25.188	42.000	52.400	
MCC-D5	0.480	MCC-D5	MCC	12.422	3.7	1.170	14.539	25.122	42.000	52.400	
MCC1 LS	0.480	MCC1 LS	MCC	7.303	1.5	1.015	7.409	11.576	65.000	81.100	
MCCB1 LS	0.480	MCCB1 LS	MCC	14.601	4.1	1.198	17.490	30.278	42.000	52.400	
MCCD1 LS	0.480	MCCD1 LS	MCC	9.597	2.6	1.083	10.390	17.552	42.000	52.400	
MCCD2 LS	0.480	MCCD2 LS	MCC	9.311	2.6	1.084	10.094	17.064	42.000	52.400	
MECH SCREEN CP	0.480	MECH SCREEN CP	Panelboard	2.593	0.2	1.000	2.593	3.667	50.000	62.300	
MOV RATE OF FLOW	0.480	MOV RATE OF FLOW	Bus	0.867	0.1	1.000	0.867	1.226			
MTS-AC1-LOAD	0.480	MTS-AC1-LOAD	Bus	1.771	0.2	1.000	1.771	2.505			
	0.480	MCC D4/D5 MTS	SPDT Switch	1.771	0.2	1.000	1.771	2.505	0.000	10.000	
MTS-MCC D4 LINE	0.480	MTS-MCC D4 LINE	Bus	1.771	0.2	1.000	1.771	2.505			
	0.480	MCC D4/D5 MTS	SPDT Switch	1.771	0.2	1.000	1.771	2.505	0.000	10.000	
MTS-MCC D5-LINE	0.480	MTS-MCC D5-LINE	Bus	1.753	0.2	1.000	1.753	2.479			
NEW MAINT. BLDG	0.480	NEW MAINT. BLDG	Bus	7.350	1.8	1.029	7.563	12.175			
OLD MAINTENANCE BLDG	0.480	OLD MAINTENANCE BLDG	Bus	4.745	0.7	1.000	4.746	6.786			
PLANT DRAIN #3	0.480	PLANT DRAIN #3	Bus	12.419	3.2	1.133	14.065	24.166			
PLANT DRAIN PS CTL PNL	0.480	PLANT DRAIN PS CTL PNL	Bus	7.584	1.8	1.029	7.802	12.557			

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
PMS-7A LS	4.160	PMS-7A LS	Bus	9.135	2.3	1.066	9.742	16.302			
	4.160	SW-PMS-7A	SPST Switch	9.135	2.3	1.066	9.742	16.302		40.000	0.000
PMS-8A LS	4.160	PMS-8A LS	Bus	9.168	2.3	1.067	9.778	16.364			
	4.160	SW-PMS-8A	SPST Switch	9.168	2.3	1.067	9.778	16.364		40.000	0.000
PNL CP	0.208	PNL CP	Panelboard	1.263	1.1	1.003	1.267	1.885	50.000	62.300	
PNL DP #1	0.480	PNL DP #1	Panelboard	8.611	2.1	1.052	9.058	14.990	65.000	81.100	
PNL DP #2	0.480	PNL DP #2	Panelboard	8.699	2.2	1.053	9.164	15.183	65.000	81.100	
PNL DP #4	0.480	PNL DP #4	Panelboard	8.651	2.4	1.071	9.267	15.558	65.000	81.100	
PNL L1	0.208	PNL L1	Panelboard	2.509	1.4	1.010	2.535	3.906	50.000	62.300	
PNL LB1	0.208	PNL LB1	Panelboard	1.884	1.5	1.015	1.913	2.995	50.000	62.300	
PNL LC1/LC2	0.208	PNL LC1/LC2	Panelboard	1.808	1.4	1.011	1.827	2.821	50.000	62.300	
PNL LD	0.208	PNL LD	Bus	1.649	1.5	1.015	1.674	2.618			
PNL LD 2	0.208	PNL LD 2	Bus	1.761	1.5	1.015	1.787	2.799			
PNL LDW	0.208	PNL LDW	Bus	1.766	1.5	1.016	1.795	2.815			
PNL LHW	0.208	PNL LHW	Panelboard	1.936	1.6	1.021	1.976	3.134	50.000	62.300	
PNL LP1	0.208	PNL LP1	Panelboard	0.800	1.1	1.003	0.803	1.195	50.000	62.300	
PNL LP2	0.208	PNL LP2	Panelboard	0.817	1.1	1.003	0.819	1.219	50.000	62.300	
PNL P3	0.480	PNL P3	Panelboard	11.528	2.2	1.053	12.136	20.095	50.000	62.300	
PNL PC/TC-2	0.208	PNL PC/TC-2	Panelboard	1.887	1.5	1.016	1.918	3.008	50.000	62.300	
PNL PC/TC-3	0.208	PNL PC/TC-3	Panelboard	1.790	1.3	1.009	1.806	2.773	50.000	62.300	
PNL PC/TC-4	0.208	PNL PC/TC-4	Bus	1.684	1.4	1.010	1.701	2.618			
PNL XLC	0.208	PNL XLC	Bus	0.570	1.7	1.023	0.583	0.929			
PNL XLC (2)	0.208	PNL XLC (2)	Bus	0.570	1.7	1.023	0.583	0.930			
PNL-P1	0.480	PNL-P1	Panelboard	5.144	0.9	1.001	5.149	7.497	50.000	62.300	
PNL-P4	0.480	PNL-P4	Panelboard	7.616	1.1	1.004	7.643	11.411	50.000	62.300	
POLYMER FEED 5, 6	0.480	POLYMER FEED 5, 6	Bus	2.638	0.3	1.000	2.638	3.731			
POLYMER FEED CP	0.480	POLYMER FEED CP	Bus	2.381	0.2	1.000	2.381	3.367			
POLYMER MIX CP	0.480	POLYMER MIX CP	Bus	2.394	0.2	1.000	2.394	3.385			
RAS 1 VFD	0.480	RAS 1 VFD	Bus	8.208	1.8	1.030	8.458	13.650			
RAS 2 VFD	0.480	RAS 2 VFD	Bus	8.189	2.0	1.041	8.526	13.954			
RAS 3 VFD	0.480	RAS 3 VFD	Bus	8.208	1.8	1.030	8.458	13.650			
RAS 7 VFD	0.480	RAS 7 VFD	Bus	8.127	1.8	1.030	8.370	13.495			
RAS 8 VFD	0.480	RAS 8 VFD	Bus	8.127	1.8	1.030	8.370	13.495			
REUSE LIFT STATION PUMP	0.480	REUSE LIFT STATION PUMP	Bus	1.655	0.2	1.000	1.655	2.341			
ROOF A/C #1	0.480	ROOF A/C #1	Bus	1.414	0.2	1.000	1.414	2.000			
S-DEEP WELL 2 LOAD	0.480	S-DEEP WELL 2 LOAD	Bus	17.060	5.2	1.262	21.524	37.251			

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Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
S-DEEP WELL 5 LOAD	0.480	S-DEEP WELL 5 LOAD	Bus	15.955	4.5	1.220	19.465	33.714			
S-MCC D1-PNL LD	0.480	S-MCC D1-PNL LD	Bus	6.221	0.8	1.001	6.225	9.015			
S-MCC D2-PNL LD	0.480	S-MCC D2-PNL LD	Bus	6.120	0.9	1.001	6.124	8.887			
S-MCC DW1-PNL LDW	0.480	S-MCC DW1-PNL LDW	Bus	8.210	0.9	1.001	8.217	11.947			
S-MCC DW2-PNL LDW	0.480	S-MCC DW2-PNL LDW	Bus	8.076	0.9	1.001	8.085	11.784			
S-MCC HW1-PNL LHW	0.480	S-MCC HW1-PNL LHW	Switchrack	10.747	1.5	1.013	10.891	16.964	42.000	52.400	
S-MCC HW2-PNL LHW	0.480	S-MCC HW2-PNL LHW	Switchrack	11.264	1.9	1.039	11.702	19.102	42.000	52.400	
S-MCCB2-PNL LB1	0.480	S-MCCB2-PNL LB1	Switchrack	10.190	1.3	1.007	10.261	15.621	42.000	52.400	
S-MCCB2-PNL P3	0.480	S-MCCB2-PNL P3	Switchrack	12.191	2.6	1.087	13.249	22.428	42.000	52.400	
S-MCCB3-PNL LB1	0.480	S-MCCB3-PNL LB1	Switchrack	10.659	1.2	1.005	10.714	16.160	42.000	52.400	
S-MCCB3-PNL P3	0.480	S-MCCB3-PNL P3	Switchrack	12.983	2.5	1.077	13.986	23.561	42.000	52.400	
S-MCCE1-PNL P4	0.480	S-MCCE1-PNL P4	Switchrack	7.178	1.0	1.002	7.192	10.588	42.000	52.400	
S-MCCE2-PNL P4	0.480	S-MCCE2-PNL P4	Switchrack	8.203	1.2	1.006	8.252	12.501	42.000	52.400	
S-PNL L1-LOAD	0.480	S-PNL L1-LOAD	Switchrack	11.337	2.2	1.058	11.989	19.933	42.000	52.400	
S-PNL LB1-LOAD	0.480	S-PNL LB1-LOAD	Switchrack	10.190	1.3	1.007	10.261	15.621	42.000	52.400	
S-PNL LD LOAD	0.480	S-PNL LD LOAD	Bus	6.120	0.9	1.001	6.124	8.887			
S-PNL LDW LOAD	0.480	S-PNL LDW LOAD	Bus	8.076	0.9	1.001	8.085	11.784			
S-PNL LHW LOAD	0.480	S-PNL LHW LOAD	Switchrack	11.264	1.9	1.039	11.702	19.102	42.000	52.400	
S-PNL P1-LOAD	0.480	S-PNL P1-LOAD	Switchrack	11.337	2.2	1.058	11.989	19.933	42.000	52.400	
S-PNL P3-LOAD	0.480	S-PNL P3-LOAD	Switchrack	12.191	2.6	1.087	13.249	22.428	42.000	52.400	
S-PNL P4-LOAD	0.480	S-PNL P4-LOAD	Switchrack	8.203	1.2	1.006	8.252	12.501	42.000	52.400	
S-SUB1-PNL L1	0.480	S-SUB1-PNL L1	Switchrack	12.678	2.7	1.094	13.873	23.563	42.000	52.400	
S-SUB1-PNL P1	0.480	S-SUB1-PNL P1	Switchrack	12.678	2.7	1.094	13.873	23.563	42.000	52.400	
S-SUB2-PNL L1	0.480	S-SUB2-PNL L1	Switchrack	11.337	2.2	1.058	11.989	19.933	42.000	52.400	
S-SUB2-PNL P1	0.480	S-SUB2-PNL P1	Switchrack	11.337	2.2	1.058	11.989	19.933	42.000	52.400	
S-SUB9-DEEP WELL 2	0.480	S-SUB9-DEEP WELL 2	Bus	14.776	4.5	1.221	18.048	31.260			
S-SUB10-DEEP WELL 2	0.480	S-SUB10-DEEP WELL 2	Bus	17.060	5.2	1.262	21.524	37.251			
S-SWBD11-DEEP WELL 5	0.480	S-SWBD11-DEEP WELL 5	Bus	14.074	4.0	1.190	16.751	28.988			
S-SWBD12-DEEP WELL 5	0.480	S-SWBD12-DEEP WELL 5	Bus	15.955	4.5	1.220	19.465	33.714			
SCUM EJECTOR CP	0.480	SCUM EJECTOR CP	Panelboard	0.933	0.1	1.000	0.933	1.320	50.000	62.300	
SEC CLARIFIERS 3, 4	0.480	SEC CLARIFIERS 3, 4	Bus	0.687	0.1	1.000	0.687	0.972			
SLUDGE THICKENER DRIVE	0.480	SLUDGE THICKENER DRIVE	Bus	3.693	0.3	1.000	3.693	5.222			
SLUICE GATE 2	0.480	SLUICE GATE 2	Bus	0.594	0.1	1.000	0.594	0.840			
SLUICE GATE #4	0.480	SLUICE GATE #4	Bus	0.594	0.1	1.000	0.594	0.840			
SODIUM BICARBONATE CP	0.480	SODIUM BICARBONATE CP	Bus	7.337	1.3	1.009	7.405	11.379			
SUB 1 BUS A	0.480	SUB 1 BUS A	Switchboard	14.385	4.8	1.240	17.832	30.881	65.000	81.100	

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
SUB1 FEED	4.160	SUB1 FEED	Bus	18.099	7.5	1.367	24.736	42.456			
SUB1 LS	0.480	SUB1 LS	Switchboard	14.385	4.8	1.240	17.832	30.881	65.000	81.100	
SUB1/SUB9	4.160	SUB1/SUB9	Cable Bus	19.367	10.8	1.455	28.170	47.846		58.000	97.880
SUB 2 BUS B	0.480	SUB 2 BUS B	Switchboard	13.891	4.9	1.244	17.286	29.932	65.000	81.100	
SUB2 FEED	4.160	SUB2 FEED	Bus	18.359	8.0	1.384	25.403	43.522			
SUB2 LS	0.480	SUB2 LS	Switchboard	13.891	4.9	1.244	17.286	29.932	65.000	81.100	
SUB2/SUB10	4.160	SUB2/SUB10	Cable Bus	19.364	10.8	1.454	28.163	47.834		58.000	97.880
SUB 3 BUS A	0.480	SUB 3 BUS A	Switchboard	13.850	4.6	1.230	17.031	29.499	65.000	81.100	
SUB3 FEED	4.160	SUB3 FEED	Cable Bus	14.900	4.4	1.214	18.094	31.338		58.000	97.880
SUB3 MAIN LS	0.480	SUB3 MAIN LS	Switchboard	13.850	4.6	1.230	17.031	29.499	65.000	81.100	
SUB 4 BUS B	0.480	SUB 4 BUS B	Switchboard	13.747	4.6	1.231	16.918	29.302	65.000	81.100	
SUB4 FEED	4.160	SUB4 FEED	Cable Bus	14.937	4.4	1.217	18.180	31.487		58.000	97.880
SUB4 MAIN LS	0.480	SUB4 MAIN LS	Switchboard	13.747	4.6	1.231	16.918	29.302	65.000	81.100	
SUB 5 BUS A	0.480	SUB 5 BUS A	Switchboard	13.701	4.3	1.210	16.581	28.714	65.000	81.100	
SUB5 FEED	4.160	SUB5 FEED	Cable Bus	10.865	3.0	1.113	12.094	20.677		58.000	97.880
SUB5 MAIN LS	0.480	SUB5 MAIN LS	Bus	13.701	4.3	1.210	16.581	28.714			
SUB 6 BUS B	0.480	SUB 6 BUS B	Switchboard	15.454	4.6	1.226	18.946	32.816	65.000	81.100	
SUB6 FEED	4.160	SUB6 FEED	Cable Bus	10.980	3.1	1.123	12.334	21.148		58.000	97.880
SUB6 MAIN LS	0.480	SUB6 MAIN LS	Bus	15.454	4.6	1.226	18.946	32.816			
SUB 7 BUS A	0.480	SUB 7 BUS A	Switchboard	13.126	4.1	1.195	15.689	27.157	65.000	81.100	
SUB7 FEED	4.160	SUB7 FEED	Bus	9.404	2.5	1.078	10.133	17.073			
SUB7 MAIN LS	0.480	SUB7 MAIN LS	Switchboard	13.126	4.1	1.195	15.689	27.157	65.000	81.100	
SUB7/SUB11	4.160	SUB7/SUB11	Cable Bus	19.364	10.8	1.454	28.163	47.834		58.000	97.880
SUB 8 BUS B	0.480	SUB 8 BUS B	Switchboard	13.541	4.0	1.192	16.145	27.942	65.000	81.100	
SUB8 FEED	4.160	SUB8 FEED	Bus	9.439	2.5	1.078	10.173	17.142			
SUB8 MAIN LS	0.480	SUB8 MAIN LS	Switchboard	13.541	4.0	1.192	16.145	27.942	65.000	81.100	
SUB8/SUB12	4.160	SUB8/SUB12	Cable Bus	19.367	10.8	1.455	28.170	47.846		58.000	97.880
SUB 9 BUS A	0.480	SUB 9 BUS A	Switchboard	15.733	5.2	1.266	19.916	34.461	65.000	81.100	
SUB9 FEED	4.160	SUB9 FEED	Bus	17.854	7.1	1.352	24.137	41.491			
SUB9 LS	0.480	SUB9 LS	Bus	15.733	5.2	1.266	19.916	34.461			
SUB 10 BUS B	0.480	SUB 10 BUS B	Switchboard	17.547	5.5	1.280	22.469	38.849	65.000	81.100	
SUB10 FEED	4.160	SUB10 FEED	Bus	18.002	7.4	1.360	24.491	42.064			
SUB10 LS	0.480	SUB10 LS	Bus	17.547	5.5	1.280	22.469	38.849			
SUB11 LS	0.480	SUB11 LS	Bus	15.736	4.5	1.224	19.269	33.374			
SUB12 LS	0.480	SUB12 LS	Bus	17.482	4.8	1.239	21.657	37.506			
SUBNATANT PUMP	0.480	SUBNATANT PUMP	Bus	9.432	1.1	1.003	9.459	14.048			

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
SUPERANANANT PS CP	0.480	SUPERANANANT PS CP	Bus	5.965	1.2	1.005	5.997	9.051			
SWBD 11 BUS A	0.480	SWBD 11 BUS A	Switchboard	14.393	4.2	1.202	17.305	29.963	65.000	81.100	
SWBD11 LS	0.480	SWBD11 LS	Bus	14.393	4.2	1.202	17.305	29.963			
SWBD 12 BUS B	0.480	SWBD 12 BUS B	Switchboard	16.275	4.6	1.229	19.998	34.637	65.000	81.100	
SWBD12 LS	0.480	SWBD12 LS	Bus	16.275	4.6	1.229	19.998	34.637			
SWGR BUS A	4.160	SWGR BUS A	Switchgear	19.367	10.8	1.455	28.170	47.846		58.000	97.880
SWGR BUS B	4.160	SWGR BUS B	Switchgear	19.364	10.8	1.454	28.163	47.834		58.000	97.880
SWGR MAIN 1 LS	4.160	SWGR MAIN 1 LS	Switchgear	19.364	10.8	1.454	28.163	47.834		58.000	97.880
SWGR MAIN 2 LS	4.160	SWGR MAIN 2 LS	Switchgear	19.367	10.8	1.455	28.170	47.846		58.000	97.880
SWITCH 11	4.160	SWITCH 11	Bus	17.723	6.9	1.344	23.822	40.982			
	4.160	SW-SW11-XFMR	SPST Switch	17.723	6.9	1.344	23.822	40.982		40.000	0.000
	4.160	SW-SW11-MAIN	SPST Switch	17.723	6.9	1.344	23.822	40.982		40.000	0.000
SWITCH 12	4.160	SWITCH 12	Bus	17.877	7.1	1.353	24.178	41.561			
	4.160	SW-SW12-XFMR	SPST Switch	17.877	7.1	1.353	24.178	41.561		40.000	0.000
	4.160	SW-SW12-MAIN	SPST Switch	17.877	7.1	1.353	24.178	41.561		40.000	0.000
T-AC-1	0.480	T-AC-1	Bus	1.183	0.1	1.000	1.183	1.673			
T-BLOWER AB1	4.160	T-BLOWER AB1	Bus	8.602	1.9	1.036	8.908	14.482			
T-BLOWER AB2	4.160	T-BLOWER AB2	Bus	8.708	2.0	1.039	9.049	14.774			
T-BLOWER AB3	4.160	T-BLOWER AB3	Bus	8.816	2.0	1.043	9.194	15.079			
T-BLOWER AB4	4.160	T-BLOWER AB4	Bus	8.819	2.0	1.043	9.200	15.092			
T-BLOWER AB5	4.160	T-BLOWER AB5	Bus	8.927	2.1	1.048	9.351	15.409			
T-DEEP WELL PUMP 1	0.480	T-DEEP WELL PUMP 1	Bus	10.223	4.6	1.230	12.571	21.774			
T-DEEP WELL PUMP 2	0.480	T-DEEP WELL PUMP 2	Bus	10.490	4.5	1.220	12.794	22.159			
T-DEEP WELL PUMP 3	0.480	T-DEEP WELL PUMP 3	Bus	10.743	4.4	1.219	13.097	22.685			
T-DEEP WELL PUMP 4	0.480	T-DEEP WELL PUMP 4	Bus	9.571	4.6	1.227	11.746	20.344			
T-DEEP WELL PUMP 5	0.480	T-DEEP WELL PUMP 5	Bus	10.047	4.4	1.219	12.251	21.219			
T-DEEP WELL PUMP 6	0.480	T-DEEP WELL PUMP 6	Bus	10.084	4.4	1.219	12.295	21.294			
T-DP1-WAS PUMP 5	0.480	T-DP1-WAS PUMP 5	Bus	1.423	0.2	1.000	1.423	2.013			
T-DP1-WAS PUMP 6	0.480	T-DP1-WAS PUMP 6	Bus	1.423	0.2	1.000	1.423	2.013			
T-DP2-WAS PUMP 1	0.480	T-DP2-WAS PUMP 1	Bus	2.826	0.3	1.000	2.826	3.997			
T-DP2-WAS PUMP 2	0.480	T-DP2-WAS PUMP 2	Bus	2.826	0.3	1.000	2.826	3.997			
T-GEN 1	4.160	T-GEN 1	Bus	2.083	19.0	1.561	3.252	5.444			
T-GEN 2	4.160	T-GEN 2	Bus	2.340	19.0	1.561	3.653	6.115			
T-MCC D4-BLOWER 1	0.480	T-MCC D4-BLOWER 1	Bus	6.007	1.5	1.014	6.089	9.493			
T-MCC D4-BLOWER 3	0.480	T-MCC D4-BLOWER 3	Bus	6.611	1.5	1.016	6.719	10.549			
T-MCC D4-PMP 1	0.480	T-MCC D4-PMP 1	Bus	4.674	1.0	1.001	4.681	6.865			

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
T-MCC D4-PMP 3	0.480	T-MCC D4-PMP 3	Bus	5.334	1.0	1.002	5.346	7.893			
T-MCC D5-BLOWER 2	0.480	T-MCC D5-BLOWER 2	Bus	5.398	1.4	1.012	5.462	8.468			
T-MCC D5-BLOWER 4	0.480	T-MCC D5-BLOWER 4	Bus	6.605	1.5	1.016	6.713	10.541			
T-MCC D5-PMP 2	0.480	T-MCC D5-PMP 2	Bus	4.156	0.9	1.001	4.161	6.077			
T-MCC D5-PMP 4	0.480	T-MCC D5-PMP 4	Bus	5.331	1.0	1.002	5.342	7.889			
T-MCCD1-PNL LD	0.208	T-MCCD1-PNL LD	Bus	1.667	1.5	1.016	1.694	2.659			
T-MCCDW1-PNL LDW	0.208	T-MCCDW1-PNL LDW	Bus	1.787	1.6	1.017	1.818	2.863			
T-MCCHW1-PNL LHW 2	0.208	T-MCCHW1-PNL LHW 2	Bus	1.960	1.7	1.023	2.005	3.194			
T-SUB2-PNL CP	0.208	T-SUB2-PNL CP	Bus	1.287	1.1	1.003	1.291	1.927			
T-SUB11-SWBD11	0.480	T-SUB11-SWBD11	Bus	15.736	4.5	1.224	19.269	33.374			
T-SUB12-SWBD12	0.480	T-SUB12-SWBD12	Bus	17.482	4.8	1.239	21.657	37.506			
T-TR-DP1-XLC	0.480	T-TR-DP1-XLC	Bus	7.048	1.2	1.004	7.079	10.634			
T-TR-DP4-XLC	0.480	T-TR-DP4-XLC	Bus	7.147	1.2	1.006	7.193	10.917			
T-TR-MCC 1-PNL XFMR	0.480	T-TR-MCC 1-PNL XFMR	Bus	5.714	0.9	1.001	5.719	8.319			
T-TR-MCC 1-PNL XFMR (2)	0.208	T-TR-MCC 1-PNL XFMR (2)	Bus	0.814	1.1	1.004	0.817	1.220			
T-TR-MCC B1-PNL XFMR	0.480	T-TR-MCC B1-PNL XFMR	Bus	11.547	1.3	1.009	11.656	17.922			
T-TR-MCC B1-PNL XFMR2	0.208	T-TR-MCC B1-PNL XFMR2	Bus	1.768	1.7	1.023	1.808	2.878			
T-TR-MCC B2-PNL (2)	0.208	T-TR-MCC B2-PNL (2)	Bus	1.950	1.6	1.022	1.992	3.165			
T-TR-MCC B2-PNL LB1 (2)	0.208	T-TR-MCC B2-PNL LB1 (2)	Bus	1.931	1.6	1.019	1.967	3.105			
T-TR-MCC D1-PNL LD 2	0.480	T-TR-MCC D1-PNL LD 2	Bus	6.690	0.9	1.001	6.699	9.806			
T-TR-MCC D1-PNL LD2 (2)	0.208	T-TR-MCC D1-PNL LD2 (2)	Bus	1.802	1.6	1.018	1.835	2.894			
T-TR-MCCB2-PNL LB1	0.480	T-TR-MCCB2-PNL LB1	Bus	8.387	0.9	1.001	8.394	12.212			
T-TR-MCCB2-PNL XFMR	0.480	T-TR-MCCB2-PNL XFMR	Bus	9.642	1.3	1.007	9.705	14.744			
T-TR-MCCB4-PNL LP2	0.480	T-TR-MCCB4-PNL LP2	Bus	10.663	1.4	1.012	10.791	16.741			
T-TR-MCCB4-PNL LP2 (2)	0.208	T-TR-MCCB4-PNL LP2 (2)	Bus	0.838	1.1	1.004	0.841	1.260			
T-TR-MCCD1-PNL LD	0.480	T-TR-MCCD1-PNL LD	Bus	5.714	0.8	1.000	5.716	8.231			
T-TR-MCCDW1-PNL LDW	0.480	T-TR-MCCDW1-PNL LDW	Bus	7.392	0.8	1.000	7.394	10.659			
T-TR-MCCHW1-PNL LHW	0.480	T-TR-MCCHW1-PNL LHW	Bus	10.309	1.5	1.014	10.449	16.288			
T-TR-SUB1/2-PNL L1 XFMR	0.480	T-TR-SUB1/2-PNL L1 XFMR	Bus	10.887	2.0	1.045	11.372	18.682			
T-TR-SUB1/2-PNL L1 XFMR 2	0.208	T-TR-SUB1/2-PNL L1 XFMR 2	Bus	4.061	1.7	1.027	4.169	6.686			
T-TR-SUB2-PNL CP XFMR	0.480	T-TR-SUB2-PNL CP XFMR	Bus	2.108	0.3	1.000	2.108	2.982			
T-TR-SUB2-PNL CP XFMR 2	0.208	T-TR-SUB2-PNL CP XFMR 2	Bus	1.312	1.1	1.004	1.317	1.972			
T-TR-T7A-PRI	4.160	T-TR-T7A-PRI	Bus	8.846	2.2	1.056	9.343	15.516			
T-TR-T7A-SEC	0.480	T-TR-T7A-SEC	Bus	13.228	4.1	1.197	15.838	27.417			
T-TR-T8A-PRI	4.160	T-TR-T8A-PRI	Bus	8.876	2.2	1.056	9.376	15.571			
T-TR-T8A-SEC	0.480	T-TR-T8A-SEC	Bus	13.202	4.1	1.197	15.804	27.359			

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Momentary Duty					Device Capability		
ID	kV	ID	Type	Symm. kA rms	X/R Ratio	M.F.	Asymm. kA rms	Asymm. kA Peak	Symm. kA rms	Asymm. kA rms	Asymm. kA Peak
THICK WAS 3 AFD	0.480	THICK WAS 3 AFD	Bus	13.800	2.9	1.112	15.350	26.238			
THICK WAS 4 AFD	0.480	THICK WAS 4 AFD	Bus	13.800	2.9	1.112	15.350	26.238			
VALVE OPERATOR	0.480	VALVE OPERATOR	Bus	5.126	0.4	1.000	5.126	7.253			
WATER HEATER	0.480	WATER HEATER	Bus	10.270	1.4	1.012	10.393	16.118			

Method: IEEE - X/R is calculated from separate R & X networks.

Protective device duty is calculated based on total fault current.

The multiplication factors for high voltage circuit-breaker and high voltage bus momentary duty (asymmetrical and crest values) are calculated based on system X/R.

\* Indicates a device with momentary duty exceeding the device capability

**APPENDIX B2 – SHORT CIRCUIT STUDY  
(INTERRUPTING DUTY SUMMARY REPORT)**



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**Interrupting Duty Summary Report**

3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
54" METER VAULT VALVE	0.480				0.938	0.1						
A/C ROOF UNIT #2	0.480				5.334	0.6						
ABFV-1	0.480				4.569	0.6						
ABFV-2	0.480				3.989	0.5						
ABFV-3	0.480				3.527	0.5						
ABFV-4	0.480				3.154	0.4						
ABFV-5	0.480				2.848	0.4						
ABW #1 EFF. WEIR GATE	0.480				0.938	0.1						
ABW #1 FESTON SYSTEM	0.480				2.247	0.3						
ABW #1 INF. WEIR GATE	0.480				0.977	0.1						
ABW #1 SLUICE GATE #1	0.480				0.594	0.1						
ABW #3 FESTON SYSTEM	0.480				2.159	0.3						
ABW #3,4,5 FESTON SYSTEM	0.480				1.309	0.2						
ABW 3,4,5 FLOCCULATOR	0.480				0.569	0.1						
ABW #3,4,6 FESTON SYSTEM	0.480				1.360	0.2						
ABW #3,4,6 SLUICE GATE	0.480				0.867	0.1						
ABW #5 SLUICE GATE	0.480				0.938	0.1						
ABW #6 FESTON SYSTEM	0.480				2.162	0.3						
ABW #6 SLUICE GATE	0.480				0.901	0.1						
ABW 6,7 FLASH MIXER #3	0.480				0.807	0.1						
ABW #7 FESTON SYSTEM	0.480				1.938	0.3						
ABW FILTER #2	0.480				2.080	0.3						
ABW SLUICE GATE	0.480				0.569	0.1						
ACU-1	0.480				6.498	1.2						
AFD-MCC D1-THICKENER	0.480				6.748	0.9						
AIR COMPRESSOR	0.480				9.308	0.9						
AIR COMPRESSOR 2	0.480				8.838	0.8						
BASIN 1 ADFV 13	0.480				2.814	0.3						
BASIN 2 ADFV 14	0.480				2.269	0.2						
BASIN 3 ADFV 15	0.480				1.790	0.2						
BASIN 4 ADFV 16	0.480				1.477	0.2						

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
BELT FILTER PRESS 1	0.480				6.170	0.7						
BELT FILTER PRESS 2	0.480				6.105	0.7						
BELT FILTER PRESS 3	0.480				7.105	0.8						
BELT FILTER PRESS 4	0.480				7.203	0.8						
BELT FILTER PRESS 5	0.480				8.560	1.0						
BELT FILTER PRESS 6	0.480				8.556	1.0						
BLOWER #6 INLET VALVE	0.480				7.261	1.5						
BLOWER A LS	4.160	F-BLOWER A-FEED	Fuse		9.697	2.7	1.000	9.697	5.500	3.95	50.000	50.000
BLOWER B LS	4.160	F-BLOWER B-FEED	Fuse		9.817	2.9	1.000	9.817	5.500	3.95	50.000	50.000
BLOWER BUS A	4.160	F-BLOWER A-FEED	Fuse		9.697	2.7	1.000	9.697	5.500	3.95	50.000	50.000
BLOWER BUS B	4.160	F-BLOWER B-FEED	Fuse		9.817	2.9	1.000	9.817	5.500	3.95	50.000	50.000
CLARIFIER 1 CP	0.480				1.495	0.2						
CLARIFIER 2 CP	0.480				1.503	0.2						
CLARIFIER 5 CP	0.480				1.493	0.2						
CONVEYOR CP	0.480				4.750	0.5						
D-DP1-RAS PUMP 7	0.480				6.425	1.1						
D-DP1-RAS PUMP 8	0.480				6.425	1.1						
D-DP1-WAS 5	0.480	B-DP1-WAS 5(2)	Molded Case		6.171	0.9	1.000	6.171	0.480	30.00	18.000	18.000
D-DP1-WAS 6	0.480	B-DP1-WAS 6(2)	Molded Case		6.171	0.9	1.000	6.171	0.480	30.00	18.000	18.000
D-DP2-RAS PUMP 1	0.480				5.493	0.9						
D-DP2-RAS PUMP 3	0.480				5.493	0.9						
D-DP2-WAS 1	0.480	B-DP2-WAS 1(2)	Molded Case		6.220	0.9	1.000	6.220	0.480	30.00	18.000	18.000
D-DP2-WAS 2	0.480	B-DP2-WAS 2(2)	Molded Case		6.220	0.9	1.000	6.220	0.480	30.00	18.000	18.000
D-DP4-RAS PUMP 2	0.480				6.894	1.3						
D-DP4-WAS 2	0.480	B-DP4-WAS 2(2)	Molded Case		6.273	0.9	1.000	6.273	0.480	30.00	18.000	18.000
D-DP4-WAS PUMP 2	0.480				2.851	0.4						
D-MCC 1-EXHAUST 1	0.480				2.852	0.4						
D-MCC 1-EXHAUST 2	0.480				2.852	0.4						
D-MCC 1-EXHAUST 3	0.480				2.852	0.4						
D-MCC 1-EXHAUST 4	0.480				2.852	0.4						
D-MCC B1-AIR BLOWER	0.480				11.596	1.9						
D-MCC B1-DAF THICK 2	0.480				3.012	0.2						
D-MCC B1-EAST DAF RECYC	0.480				11.257	1.8						

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
D-MCC	0.480				9.179	1.3						
B1-PRESSURIZATION												
D-MCC B1-THICK WAS 3	0.480				9.579	1.2						
D-MCC B1-THICK WAS 4	0.480				9.579	1.2						
D-MCC B1-WEST DAF RECYC	0.480				11.257	1.8						
D-MCC B2-AIR COMPRESSOR	0.480				6.615	0.7						
D-MCC B2-EQ DIVERSION VLV	0.480				2.831	0.2						
D-MCC B2-RETURN SLUDGE 1	0.480				4.348	0.5						
D-MCC B2-RETURN SLUDGE 2	0.480				5.603	0.6						
D-MCC B2-RETURN SLUDGE 3	0.480				4.901	0.5						
D-MCC B2-RETURN SLUDGE 4	0.480				4.901	0.5						
D-MCC B2-RETURN SLUDGE 5	0.480				4.348	0.5						
D-MCC B3-STANDBY PRESSURE	0.480				10.033	1.5						
D-MCC D1-BFP FEED PUMP	0.480				3.644	0.4						
D-MCC D1-BFP FEED PUMP5	0.480				3.861	0.5						
D-MCC D1-GRAVITY THICK	0.480				1.805	0.2						
D-MCC D1-SLUDGE RECIRC 1	0.480				6.026	0.9						
D-MCC D1-SLUDGE RECIRC 3	0.480				5.527	0.8						
D-MCC D1-SLUDGE RECIRC 4	0.480				5.093	0.7						
D-MCC D1-SLUDGE TRANSFER1	0.480				6.609	1.0						
D-MCC D1-THICKENER	0.480				1.818	0.2						
D-MCC D2-BFP FEED PUMP1	0.480				4.595	0.6						
D-MCC D2-BFP FEED PUMP4	0.480				3.373	0.4						
D-MCC D2-BFP FEED PUMP6	0.480				2.967	0.4						
D-MCC D2-SLUDGE RECIRC 2	0.480				4.488	0.6						
D-MCC D2-SLUDGE TRANSFER2	0.480				1.925	0.3						
D-MCC D2-SLUDGE TRANSFER3	0.480				4.042	0.5						
D-MCC D2-SLUDGE TRANSFER4	0.480				6.722	1.0						

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
D-MCC DW1-PLANT DRAIN1	0.480				2.222	0.3						
D-MCC DW1-PLANT DRAIN2	0.480				2.222	0.3						
D-MCC DW1-PLANT DRAIN3	0.480				2.222	0.3						
D-MCC E1-EF-7	0.480				2.653	0.3						
D-MCC E1-FLASH MIXER 1	0.480				0.530	0.1						
D-MCC E1-FLASH MIXER 2	0.480				0.892	0.1						
D-MCC E2-EF-5.1	0.480				1.658	0.2						
D-MCC E2-EF-5.2	0.480				1.658	0.2						
D-MCC HW1-CONVEYOR EAST	0.480				4.028	0.4						
D-MCC HW1-FINAL CLAR. 3	0.480				0.269	0.0						
D-MCC HW1-FINAL CLAR. 4	0.480				0.273	0.0						
D-MCC HW1-GRIT CLASS WEST	0.480				1.227	0.1						
D-MCC HW1-PRI. SLUDGE	0.480				0.385	0.1						
D-MCC HW1-RSP 4	0.480				4.237	0.7						
D-MCC HW1-RSP 5	0.480				4.237	0.7						
D-MCC HW1-WEST CONVEYOR	0.480				1.182	0.1						
D-MCC HW2-GRIT CLASS 2	0.480				1.883	0.2						
D-MCC HW2-GRIT PUMP 2	0.480				3.462	0.3						
D-MCC HW2-PRI. SLUDGE 1	0.480				0.530	0.1						
D-MCC HW2-PRI. SLUDGE 3	0.480				0.530	0.1						
D-MCC HW2-RSP 6	0.480				4.202	0.7						
D-MCC HW2-WAS PUMP 3	0.480				0.851	0.1						
D-MCC HW2-WAS PUMP 4	0.480				0.851	0.1						
D-MCCB4-SUBM PUMP START	0.480				2.230	0.3						
DAF THICKENER 2 AFD	0.480				7.847	0.7						
DAVIS SCRUBBER	0.480				8.341	1.2						
DEEP WELL PUMP 1 VFD	0.480	B-SUB9-DEEP WELL 1 VFD	Molded Case		15.166	4.9	1.000	15.166	0.480	20.00	50.000	50.000
DEEP WELL PUMP 2 VFD	0.480	B-SUB9/10-DEEP WELL 2 VFD	Molded Case		16.163	4.7	1.000	16.163	0.480	20.00	50.000	50.000
DEEP WELL PUMP 3 VFD	0.480	B-SUB10-DEEP WELL 3 VFD	Molded Case		17.061	5.2	1.012	17.268	0.480	20.00	50.000	50.000
DEEP WELL PUMP 4 VFD	0.480	B-SWBD11-DEEP WELL 4 VFD	Molded Case		13.991	4.1	1.000	13.991	0.480	20.00	50.000	50.000

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty					Device Capability			
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
DEEP WELL PUMP 5 VFD	0.480	B-DEEP WELL 5 VFD	Molded Case		15.450	4.3	1.000	15.450	0.480	20.00	50.000	50.000
DEEP WELL PUMP 6 VFD	0.480	B-SWBD12-DEEP WELL 6 VFD	Molded Case		15.749	4.4	1.000	15.749	0.480	20.00	50.000	50.000
DEGRITTER CP	0.480				2.997	0.3						
DP1 MAIN LS	0.480	B-DP1 MAIN	Molded Case		8.611	2.1	1.000	8.611	0.480	20.00	65.000	65.000
DP2 MAIN LS	0.480	B-DP2 MAIN	Molded Case		8.699	2.2	1.000	8.699	0.480	20.00	65.000	65.000
DP4 MAIN LS	0.480	B-DP4 MAIN	Molded Case		8.651	2.4	1.000	8.651	0.480	20.00	65.000	65.000
EFF. FILTER PS CNTRL	0.480				8.447	2.0						
ELECTRIC ROLL-UP DOOR	0.480				3.527	0.5						
EQ TANK RETURN	0.480				2.569	0.2						
FPL PRIMARY	23.000				1.312	8.5						
FPL SERVICE	4.160				17.767	11.8						
HOIST	0.480				7.134	0.7						
LIGHTING PANEL	0.208				1.593	1.3						
LTG. PNL	0.208				1.902	1.6						
MAIN GATE CP	0.480				0.755	0.1						
MCC 1	0.480	MCC 1-MAIN	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-EXHAUST 1	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-ACU 1	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-LP1	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-EXHAUST 2	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-EXHAUST 3	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-EXHAUST 4	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-ABFV-1	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-ABFV-5	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-ABFV-4	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-ABFV-3	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-ABFV-2	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-ROLL-UP DOOR	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-BLOWER #6 INLET	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
		B-MCC 1-SPARE	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
MCC B1	0.480	B-MCC B1-AIR COMPRESSOR	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
		MCC B1-MAIN	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
		B-MCC B1-WEST DAF RECYC	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty					Device Capability			
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
MCC B1		B-MCC B1-EAST DAF RECYC	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
		B-MCC B1-PRESSURIZATION	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
		B-MCC B1-AIR BLOWER	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
		B-MCC B1-AIR COMPRESSOR 2	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
		B-MCC B1-THICK WAS 3	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
		B-MCC B1-THICK WAS 4	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
		B-MCC B1-DAF THICK 2	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
		B-MCC B1-SUBNATANT	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
		B-MCC B1-PNL	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
MCC B2	0.480	B-MCC B2-RETURN SLUDGE 1	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-HOIST	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-PNL LB1	Molded Case		13.194	4.0	1.052	13.879	0.480	30.00	14.000	14.000
		B-MCC B2-SPARE 1	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-SPARE 2	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-SPARE 3	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-SPARE 4	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-SPARE 5	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-RETURN SLUDGE 2	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-RETURN SLUDGE 4	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-RETURN SLUDGE 3	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-RETURN SLUDGE 5	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-SPARE 6	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-AIR COMPRESSOR	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-EQ DIVERSION VLV	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-SLUDGE THICKENER	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
		B-MCC B2-SPARE 7	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000
B-MCC B2-SPARE 8	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000		
B-MCC B2-PNL P3	Molded Case		13.194	4.0	1.000	13.194	0.480	20.00	65.000	65.000		
MCC B3	0.480	B-MCC B3-SPARE 1	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000
		B-MCC B3-SPARE 2	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty					Device Capability			
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
MCC B3		B-MCC B3-SPARE 3	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000
		B-MCC B3-SPARE 4	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000
		B-MCC B3-SPARE 5	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000
		B-MCC B3-SPARE 6	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000
		B-MCC B3-SPARE 7	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000
		B-MCC B3-STANDBY PRESSURE	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000
		B-MCC B3-SPARE 8	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	25.000	25.000
		B-MCC B3-SPARE 9	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000
		B-MCC B3-VALVE OP	Molded Case		14.155	3.8	1.043	14.758	0.480	30.00	18.000	18.000
		B-MCC B3-PNL LB1	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000
B-MCC B3-PNL P3	Molded Case		14.155	3.8	1.000	14.155	0.480	20.00	65.000	65.000		
MCC B4	0.480	B-MCC B4-SPARE 1	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCC B4-SPARE 2	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCC B4-SPARE 3	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCC B4-SPARE 4	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCC B4-SPARE 5	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCC B4-SPARE 6	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCC B4-SPARE 7	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCCB4-SUBM PUMP START	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCC B4-SPARE 8	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCC B4-EQ TANK RETURN	Molded Case		13.141	4.0	1.050	13.805	0.480	30.00	18.000	18.000
		B-MCC B4-PNL LP2	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCC B4-ADFV 13	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
		B-MCC B4-ADFV 15	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000
B-MCC B4-ADFV 14	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000		
B-MCC B4-ADFV 16	Molded Case		13.141	4.0	1.000	13.141	0.480	20.00	65.000	65.000		
MCC D1	0.480	B-MCC D1-SUPERANANT	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000
		B-MCC D1-SODIUM BICARB CP	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000
		B-MCC D1-PNL. LD 2	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000
		B-MCC D1-PNL. LD	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000
		B-MCC D1-SPARE 1	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000
		B-MCC D1-SPARE 2	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000
B-MCC D1-GRAVITY THICK	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty					Device Capability					
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.		
MCC D1		MCC D1 MAIN	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-BFP FEED PUMP	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SLUDGE TRANSFER1	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D2-SLUDGE TRANSFER4	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SLUDGE RECIRC 1	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SLUDGE RECIRC 3	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SLUDGE RECIRC 4	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SPARE 3	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SPARE 4	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SPARE 5	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SPARE 6	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-BFP FEED PUMP5	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SPARE 7	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-THICKENER	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SPARE 8	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SPARE 9	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SPARE 10	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		B-MCC D1-SPARE 11	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000		
		MCC D2	0.480	B-MCC D2-PNL. LD	Molded Case		9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000
				B-MCC D2-SPARE 4	Molded Case		9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000
B-MCC D2-SPARE 5	Molded Case				9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000		
B-MCC D2-BFP FEED PUMP1	Molded Case				9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000		
B-MCC D2-SLUDGE TRANSFER2	Molded Case				9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000		
B-MCC D2-SLUDGE RECIRC 2	Molded Case				9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000		
B-MCC D2-SPARE 6	Molded Case				9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000		
B-MCC D2-SPARE 7	Molded Case				9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000		
B-MCC D2-BFP FEED PUMP4	Molded Case				9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000		
B-MCC D2-BFP FEED PUMP6	Molded Case				9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000		
B-MCC D2-SLUDGE TRANSFER3	Molded Case				9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000		
B-MCC D2-SPARE 1	Molded Case				9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000		



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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty					Device Capability			
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
MCC D2		B-MCC D2-SPARE 2	Molded Case		9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000
		B-MCC D2-SPARE 3	Molded Case		9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000
		B-MCC D2-SPARE 8	Molded Case		9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000
		MCC D2 MAIN	Molded Case		9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000
MCC D4 LS	0.480	B-MCC D4 MAIN	Molded Case		12.449	3.7	1.000	12.449	0.480	20.00	65.000	65.000
MCC D5 LS	0.480	B-MCC D5 MAIN	Molded Case		12.422	3.7	1.000	12.422	0.480	20.00	65.000	65.000
MCC DW1	0.480	B-MCC DW1-WATER HEATER	Molded Case		12.859	3.7	1.000	12.859	0.480	20.00	65.000	65.000
		B-MCC DW1-POLYMER MIX	Molded Case		12.859	3.7	1.000	12.859	0.480	20.00	65.000	65.000
		B-MCC DW1-BFP 1	Molded Case		12.859	3.7	1.000	12.859	0.480	20.00	65.000	65.000
		B-MCC DW1-BFP 4	Molded Case		12.859	3.7	1.000	12.859	0.480	20.00	65.000	65.000
		B-MCC DW1-BFP 5	Molded Case		12.859	3.7	1.000	12.859	0.480	20.00	65.000	65.000
		B-MCC DW1-BFP 6	Molded Case		12.859	3.7	1.000	12.859	0.480	20.00	65.000	65.000
		B-MCC DW1-PLANT DRAIN	Molded Case		12.859	3.7	1.000	12.859	0.480	20.00	65.000	65.000
		B-MCC DW1-PNL. LDW	Molded Case		12.859	3.7	1.000	12.859	0.480	20.00	65.000	65.000
MCC DW2	0.480	B-MCC DW2-SPARE	Molded Case		12.450	3.7	1.000	12.450	0.480	20.00	65.000	65.000
		B-MCC DW2-POLYMER FEED	Molded Case		12.450	3.7	1.000	12.450	0.480	20.00	65.000	65.000
		B-MCC DW2-BFP 2	Molded Case		12.450	3.7	1.000	12.450	0.480	20.00	65.000	65.000
		B-MCC DW2-BFP 3	Molded Case		12.450	3.7	1.000	12.450	0.480	20.00	65.000	65.000
		B-MCC DW2-PNL. LDW	Molded Case		12.450	3.7	1.000	12.450	0.480	20.00	65.000	65.000
		B-MCC DW2-CONVEYOR CP	Molded Case		12.450	3.7	1.000	12.450	0.480	20.00	65.000	65.000
		B-MCC DW2-POLYMER FEEDS/6	Molded Case		12.450	3.7	1.000	12.450	0.480	20.00	65.000	65.000
MCC E1	0.480	B-MCC-E1 ABW #6 SLUICE	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC-E1 ABW #6 FESTON	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC-E1 ABW #5 SLUICE	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC-E1 ABW #1 FESTON	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-SPARE	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC-E1 ABW 3,5,6 SLUICE	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-EF-7	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-ABW 3,4,6 FESTON	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-ROOF A/C #1	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-FLASH MIXER 1	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty					Device Capability			
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
MCC E1		B-MCC E1-FLASH MIXER 2	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-54" METER VAULT	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-SLUICE GATE #4	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-REUSE LIFT PUMP	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-EFF. WEIR GATE	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-INF. WEIR GATE	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-PNL. DP #2	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
		B-MCC E1-PNL. DP #1	Molded Case		12.795	4.0	1.000	12.795	0.480	20.00	65.000	65.000
MCC E2	0.480	B-MCC E2-ABW #3 FESTON	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-SLUICE GATE 2	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-PLANT DRAIN PS	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	45.000	45.000
		B-MCC E2-ABW 3,4,5 FLOCC	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	30.000	30.000
		B-MCC E2-ABW 3,4,5 FESTON	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-MOV RATE	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-ABW SLUICE GATE	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-ABW #7 FESTON	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-EFF. FILTER PS	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	30.000	30.000
		B-MCC E2-PNL. DP #4	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-PNL. P4	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-SPARE 1	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-A/C ROOF UNIT 2	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-ABW #1 SLUICE 1	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-ABW FILTER 2	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-EF-5.1	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC E2-EF-5.2	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
B-MCC E2-SPARE 2	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000		
B-MCC E2-SPARE 3	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000		
MCC HW 1	0.480	B-MCC E2-ABW 6,7FLASH MIX	Molded Case		12.434	4.1	1.000	12.434	0.480	20.00	65.000	65.000
		B-MCC HW1-MECH SCREEN	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-SPARE 2	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty					Device Capability			
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
MCC HW 1		B-MCC HW1-GRIT CLASS WEST	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-SPARE 3	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-SPARE 1	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC E2-SPARE 5	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC E2-SPARE 6	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-WEST CONVEYOR	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-PRI. SLUDGE	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-SPARE 4	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-SPARE 5	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-SPARE 6	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-SPARE 7	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-CONVEYOR EAST	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-SPARE 8	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-SPARE 9	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-FINAL CLAR. 3	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-FINAL CLAR. 4	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-SCUM EJECTOR	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-MAIN GATE	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-RSP 4	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
		B-MCC HW1-RSP 5	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000
B-MCC HW1-PNL LHW	Molded Case		13.190	4.3	1.000	13.190	0.480	20.00	65.000	65.000		
MCC HW 2	0.480	B-MCC HW2-SEC CLARIFIER	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-GRIT PUMP 2	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-SPARE 1	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-GRIT CLASS 2	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-SPARE 2	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-SPARE 3	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-SPARE 4	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-SPARE 7	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-WAS PUMP 3	Molded Case		12.778	4.1	1.061	13.554	0.480	30.00	14.000	14.000
		B-MCC HW2-RSP 6	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
B-MCC HW2-PNL LHW	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000		

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty					Device Capability			
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
MCC HW 2		B-MCC HW2-DAVIS SCRUBBER	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-DEGRITTER CP	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-PRI. SLUDGE 1	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-PRI. SLUDGE 3	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-SPARE 5	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-SPARE 6	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-WAS PUMP 4	Molded Case		12.778	4.1	1.061	13.554	0.480	30.00	14.000	14.000
		B-MCC HW2-SPARE 8	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-SPARE 9	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
		B-MCC HW2-SPARE 10	Molded Case		12.778	4.1	1.000	12.778	0.480	20.00	65.000	65.000
MCC-D4	0.480	B-MCC D4 MAIN	Molded Case		12.449	3.7	1.000	12.449	0.480	20.00	65.000	65.000
		B-MCC D4-BLOWER 1	Molded Case		12.449	3.7	1.000	12.449	0.480	20.00	65.000	65.000
		B-MCC D4-BLOWER 3	Molded Case		12.449	3.7	1.000	12.449	0.480	20.00	65.000	65.000
		B-MCC D4-PMP 1	Molded Case		12.449	3.7	1.000	12.449	0.480	20.00	65.000	65.000
		B-MCC D4-PMP 3	Molded Case		12.449	3.7	1.000	12.449	0.480	20.00	65.000	65.000
B-MCC D4-MTS	Molded Case		12.449	3.7	1.000	12.449	0.480	20.00	65.000	65.000		
MCC-D5	0.480	B-MCC D5 MAIN	Molded Case		12.422	3.7	1.000	12.422	0.480	20.00	65.000	65.000
		B-MCC D5-BLOWER 2	Molded Case		12.422	3.7	1.000	12.422	0.480	20.00	65.000	65.000
		B-MCC D5-BLOWER 4	Molded Case		12.422	3.7	1.000	12.422	0.480	20.00	65.000	65.000
		B-MCC D5-PMP 2	Molded Case		12.422	3.7	1.000	12.422	0.480	20.00	65.000	65.000
		B-MCC D5-PMP 4	Molded Case		12.422	3.7	1.000	12.422	0.480	20.00	65.000	65.000
B-MCC D5-MTS	Molded Case		12.422	3.7	1.000	12.422	0.480	20.00	65.000	65.000		
MCC1 LS	0.480	MCC 1-MAIN	Molded Case		7.303	1.5	1.000	7.303	0.480	20.00	65.000	65.000
MCCB1 LS	0.480	MCC B1-MAIN	Molded Case		14.601	4.1	1.000	14.601	0.480	20.00	65.000	65.000
MCCD1 LS	0.480	MCC D1 MAIN	Molded Case		9.597	2.6	1.000	9.597	0.480	20.00	65.000	65.000
MCCD2 LS	0.480	MCC D2 MAIN	Molded Case		9.311	2.6	1.000	9.311	0.480	20.00	65.000	65.000
MECH SCREEN CP	0.480				2.593	0.2						
MOV RATE OF FLOW	0.480				0.867	0.1						
MTS-MCC D5-LINE	0.480				1.753	0.2						
NEW MAINT. BLDG	0.480				7.350	1.8						
OLD MAINTENANCE BLDG	0.480				4.745	0.7						
PLANT DRAIN #3	0.480				12.419	3.2						

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Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
PLANT DRAIN PS CTL PNL	0.480				7.584	1.8						
PMS-7A LS	4.160	F-TR-T7A-P	Fuse		9.135	2.3	1.000	9.135	5.500	6.70	40.000	40.000
PMS-8A LS	4.160	F-TR-T8A-P	Fuse		9.168	2.3	1.000	9.168	5.500	6.70	40.000	40.000
PNL CP	0.208				1.263	1.1						
PNL DP #1	0.480	B-DP1-WAS 5	Molded Case		8.611	2.1	1.000	8.611	0.480	30.00	18.000	18.000
		B-DP1-WAS 6	Molded Case		8.611	2.1	1.000	8.611	0.480	30.00	18.000	18.000
		B-DP1-RAS 7	Molded Case		8.611	2.1	1.000	8.611	0.480	30.00	18.000	18.000
		B-DP1-RAS 8	Molded Case		8.611	2.1	1.000	8.611	0.480	30.00	18.000	18.000
		B-DP1-CLARIFIER	Molded Case		8.611	2.1	1.000	8.611	0.480	30.00	18.000	18.000
		B-DP1-XLC	Molded Case		8.611	2.1	1.000	8.611	0.480	30.00	18.000	18.000
		B-DP1 MAIN	Molded Case		8.611	2.1	1.000	8.611	0.480	20.00	65.000	65.000
PNL DP #2	0.480	B-DP2-WAS 1	Molded Case		8.699	2.2	1.000	8.699	0.480	30.00	18.000	18.000
		B-DP2-RAS 1	Molded Case		8.699	2.2	1.000	8.699	0.480	30.00	18.000	18.000
		B-DP2-RAS 3	Molded Case		8.699	2.2	1.000	8.699	0.480	30.00	18.000	18.000
		B-DP2-WAS 2	Molded Case		8.699	2.2	1.000	8.699	0.480	30.00	18.000	18.000
		B-DP2 MAIN	Molded Case		8.699	2.2	1.000	8.699	0.480	20.00	65.000	65.000
		B-DP2-CLARIFIER1	Molded Case		8.699	2.2	1.000	8.699	0.480	30.00	18.000	18.000
		B-DP2-SPARE1	Molded Case		8.699	2.2	1.000	8.699	0.480	30.00	18.000	18.000
		B-DP2-SPARE2	Molded Case		8.699	2.2	1.000	8.699	0.480	30.00	18.000	18.000
PNL DP #4	0.480	B-DP4 MAIN	Molded Case		8.651	2.4	1.000	8.651	0.480	20.00	65.000	65.000
		B-DP4-WAS 2	Molded Case		8.651	2.4	1.000	8.651	0.480	30.00	18.000	18.000
		B-DP4-RAS 2	Molded Case		8.651	2.4	1.000	8.651	0.480	30.00	18.000	18.000
		B-DP4-CLARIFIER	Molded Case		8.651	2.4	1.000	8.651	0.480	30.00	18.000	18.000
		B-DP4-XLC	Molded Case		8.651	2.4	1.000	8.651	0.480	30.00	18.000	18.000
PNL L1	0.208				2.509	1.4						
PNL LB1	0.208				1.884	1.5						
PNL LC1/LC2	0.208				1.808	1.4						
PNL LD	0.208				1.649	1.5						
PNL LD 2	0.208				1.761	1.5						
PNL LDW	0.208				1.766	1.5						
PNL LHW	0.208				1.936	1.6						
PNL LP1	0.208				0.800	1.1						
PNL LP2	0.208				0.817	1.1						
PNL P3	0.480	B-PNL P3	Molded Case		11.528	2.2	1.026	11.825	0.480	50.00	10.000	10.000 *

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Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
PNL PC/TC-2	0.208				1.887	1.5						
PNL PC/TC-3	0.208				1.790	1.3						
PNL PC/TC-4	0.208				1.684	1.4						
PNL XLC	0.208				0.570	1.7						
PNL XLC (2)	0.208				0.570	1.7						
PNL-P1	0.480				5.144	0.9						
PNL-P4	0.480				7.616	1.1						
POLYMER FEED 5, 6	0.480				2.638	0.3						
POLYMER FEED CP	0.480				2.381	0.2						
POLYMER MIX CP	0.480				2.394	0.2						
RAS 1 VFD	0.480				8.208	1.8						
RAS 2 VFD	0.480				8.189	2.0						
RAS 3 VFD	0.480				8.208	1.8						
RAS 7 VFD	0.480				8.127	1.8						
RAS 8 VFD	0.480				8.127	1.8						
REUSE LIFT STATION PUMP	0.480				1.655	0.2						
ROOF A/C #1	0.480				1.414	0.2						
S-DEEP WELL 2 LOAD	0.480				17.060	5.2						
S-DEEP WELL 5 LOAD	0.480				15.955	4.5						
S-MCC D1-PNL LD	0.480				6.221	0.8						
S-MCC D2-PNL LD	0.480				6.120	0.9						
S-MCC DW1-PNL LDW	0.480				8.210	0.9						
S-MCC DW2-PNL LDW	0.480				8.076	0.9						
S-MCC HW1-PNL LHW	0.480				10.747	1.5						
S-MCC HW2-PNL LHW	0.480				11.264	1.9						
S-MCCB2-PNL LB1	0.480				10.190	1.3						
S-MCCB2-PNL P3	0.480				12.191	2.6						
S-MCCB3-PNL LB1	0.480				10.659	1.2						
S-MCCB3-PNL P3	0.480				12.983	2.5						
S-MCCE1-PNL P4	0.480				7.178	1.0						
S-MCCE2-PNL P4	0.480				8.203	1.2						
S-PNL L1-LOAD	0.480				11.337	2.2						
S-PNL LB1-LOAD	0.480				10.190	1.3						
S-PNL LD LOAD	0.480				6.120	0.9						

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
S-PNL LDW LOAD	0.480				8.076	0.9						
S-PNL LHW LOAD	0.480				11.264	1.9						
S-PNL P1-LOAD	0.480				11.337	2.2						
S-PNL P3-LOAD	0.480				12.191	2.6						
S-PNL P4-LOAD	0.480				8.203	1.2						
S-SUB1-PNL L1	0.480				12.678	2.7						
S-SUB1-PNL P1	0.480				12.678	2.7						
S-SUB2-PNL L1	0.480				11.337	2.2						
S-SUB2-PNL P1	0.480				11.337	2.2						
S-SUB9-DEEP WELL 2	0.480				14.776	4.5						
S-SUB10-DEEP WELL 2	0.480				17.060	5.2						
S-SWBD11-DEEP WELL 5	0.480				14.074	4.0						
S-SWBD12-DEEP WELL 5	0.480				15.955	4.5						
SCUM EJECTOR CP	0.480				0.933	0.1						
SEC CLARIFIERS 3, 4	0.480				0.687	0.1						
SLUDGE THICKENER DRIVE	0.480				3.693	0.3						
SLUICE GATE 2	0.480				0.594	0.1						
SLUICE GATE #4	0.480				0.594	0.1						
SODIUM BICARBONATE CP	0.480				7.337	1.3						
SUB 1 BUS A	0.480	B-SUB1-MAIN	Molded Case		14.385	4.8	1.000	14.385	0.480	20.00	100.000	100.000
		B-SUB1-PNL L1	Molded Case		14.385	4.8	1.000	14.385	0.480	20.00	25.000	25.000
		B-SUB1-PNL P1	Molded Case		14.385	4.8	1.000	14.385	0.480	20.00	25.000	25.000
		B-SUB1-MCC E1	Molded Case		14.385	4.8	1.000	14.385	0.480	20.00	30.000	30.000
SUB1 FEED	4.160	F-SUB1-FEED	Fuse		18.099	7.5	1.000	18.099	5.500	3.95	50.000	50.000
SUB1 LS	0.480	B-SUB1-MAIN	Molded Case		14.385	4.8	1.000	14.385	0.480	20.00	100.000	100.000
SUB1/SUB9	4.160				17.712	11.3						
SUB 2 BUS B	0.480	B-SUB2-PNL CP	Molded Case		13.891	4.9	1.000	13.891	0.480	20.00	65.000	65.000
		B-SUB2-PNL L1	Molded Case		13.891	4.9	1.000	13.891	0.480	20.00	25.000	25.000
		B-SUB2-PNL P1	Molded Case		13.891	4.9	1.000	13.891	0.480	20.00	25.000	25.000
		B-SUB2-MCC E2	Molded Case		13.891	4.9	1.000	13.891	0.480	20.00	30.000	30.000
		B-SUB2-SPARE	Molded Case		13.891	4.9	1.000	13.891	0.480	20.00	30.000	30.000
		B-SUB2-MAIN	Molded Case		13.891	4.9	1.000	13.891	0.480	20.00	100.000	100.000
SUB2 FEED	4.160	F-SUB2-FEED	Fuse		18.359	8.0	1.000	18.359	5.500	3.95	50.000	50.000
SUB2 LS	0.480	B-SUB2-MAIN	Molded Case		13.891	4.9	1.000	13.891	0.480	20.00	100.000	100.000

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Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
SUB2/SUB10	4.160				17.711	11.3						
SUB 3 BUS A	0.480	B-SUB3-MAIN	Molded Case		13.850	4.6	1.000	13.850	0.480	20.00	100.000	100.000
		B-SUB3-MCC HW1	Molded Case		13.850	4.6	1.000	13.850	0.480	20.00	30.000	30.000
SUB3 FEED	4.160	F-SUB3-FEED	Fuse		14.900	4.4	1.000	14.900	5.500	3.95	50.000	50.000
SUB3 MAIN LS	0.480	B-SUB3-MAIN	Molded Case		13.850	4.6	1.000	13.850	0.480	20.00	100.000	100.000
SUB 4 BUS B	0.480	B-SUB4-MAIN	Molded Case		13.747	4.6	1.000	13.747	0.480	20.00	100.000	100.000
		B-SUB4-MCC HW2	Molded Case		13.747	4.6	1.000	13.747	0.480	20.00	30.000	30.000
SUB4 FEED	4.160	F-SUB4-FEED	Fuse		14.937	4.4	1.000	14.937	5.500	3.95	50.000	50.000
SUB4 MAIN LS	0.480	B-SUB4-MAIN	Molded Case		13.747	4.6	1.000	13.747	0.480	20.00	100.000	100.000
SUB 5 BUS A	0.480	B-SUB5-MAIN	Molded Case		13.701	4.3	1.000	13.701	0.480	20.00	100.000	100.000
		B-SUB5-MCC B2	Molded Case		13.701	4.3	1.000	13.701	0.480	20.00	30.000	30.000
		B-SUB5-SPARE	Molded Case		13.701	4.3	1.000	13.701	0.480	20.00	25.000	25.000
		B-SUB5-MCC B4	Molded Case		13.701	4.3	1.000	13.701	0.480	20.00	30.000	30.000
SUB5 FEED	4.160	F-SUB5-FEED	Fuse		10.865	3.0	1.000	10.865	5.500	3.95	50.000	50.000
SUB5 MAIN LS	0.480	B-SUB5-MAIN	Molded Case		13.701	4.3	1.000	13.701	0.480	20.00	100.000	100.000
SUB 6 BUS B	0.480	B-SUB6-MAIN	Molded Case		15.454	4.6	1.000	15.454	0.480	20.00	100.000	100.000
		B-SUB6-MCC 1	Molded Case		15.454	4.6	1.000	15.454	0.480	20.00	30.000	30.000
		B-SUB6-SPARE	Molded Case		15.454	4.6	1.000	15.454	0.480	20.00	30.000	30.000
		B-SUB6-MCC B3	Molded Case		15.454	4.6	1.000	15.454	0.480	20.00	30.000	30.000
		B-SUB6-MCC B1	Molded Case		15.454	4.6	1.000	15.454	0.480	20.00	30.000	30.000
SUB6 FEED	4.160	F-SUB6-FEED	Fuse		10.980	3.1	1.000	10.980	5.500	3.95	50.000	50.000
SUB6 MAIN LS	0.480	B-SUB6-MAIN	Molded Case		15.454	4.6	1.000	15.454	0.480	20.00	100.000	100.000
SUB 7 BUS A	0.480	B-SUB7-MAIN	Molded Case		13.126	4.1	1.000	13.126	0.480	20.00	100.000	100.000
		B-SUB7-MCC DW2	Molded Case		13.126	4.1	1.000	13.126	0.480	20.00	30.000	30.000
		B-SUB7-MCC D2	Molded Case		13.126	4.1	1.000	13.126	0.480	20.00	30.000	30.000
SUB7 FEED	4.160	F-SUB7-FEED	Fuse		9.404	2.5	1.000	9.404	5.500	3.95	50.000	50.000
SUB7 MAIN LS	0.480	B-SUB7-MAIN	Molded Case		13.126	4.1	1.000	13.126	0.480	20.00	100.000	100.000
SUB7/SUB11	4.160				17.711	11.3						
SUB 8 BUS B	0.480	B-SUB8-MAIN	Molded Case		13.541	4.0	1.000	13.541	0.480	20.00	100.000	100.000
		B-SUB8-MCC DW1	Molded Case		13.541	4.0	1.000	13.541	0.480	20.00	30.000	30.000
		B-SUB8-NEW MAINT. BLDG	Molded Case		13.541	4.0	1.000	13.541	0.480	20.00	65.000	65.000
		B-SUB8-MCC D1	Molded Case		13.541	4.0	1.000	13.541	0.480	20.00	30.000	30.000
SUB8 FEED	4.160	F-SUB8-FEED	Fuse		9.439	2.5	1.000	9.439	5.500	3.95	50.000	50.000
SUB8 MAIN LS	0.480	B-SUB8-MAIN	Molded Case		13.541	4.0	1.000	13.541	0.480	20.00	100.000	100.000



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Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
SUB8/SUB12	4.160				17.712	11.3						
SUB 9 BUS A	0.480	B-SUB9-MAIN	InsulUnfuse		15.733	5.2	1.015	15.973	0.480	20.00	65.000	65.000
		B-SUB9-DEEP WELL PUMP 1	InsulUnfuse		15.733	5.2	1.015	15.973	0.480	20.00	65.000	65.000
		B-SUB9-DEEP WELL PUMP 2	InsulUnfuse		15.733	5.2	1.015	15.973	0.480	20.00	65.000	65.000
SUB9 FEED	4.160	F-SUB9-FEED	Fuse		17.854	7.1	1.000	17.854	5.500	3.95	50.000	50.000
SUB9 LS	0.480	B-SUB9-MAIN	InsulUnfuse		15.733	5.2	1.015	15.973	0.480	20.00	65.000	65.000
SUB 10 BUS B	0.480	B-SUB10-MAIN	InsulUnfuse		17.547	5.5	1.027	18.020	0.480	20.00	65.000	65.000
		B-SUB10-DEEP WELL PUMP 2	InsulUnfuse		17.547	5.5	1.027	18.020	0.480	20.00	65.000	65.000
		B-SUB10-DEEP WELL PUMP 3	InsulUnfuse		17.547	5.5	1.027	18.020	0.480	20.00	65.000	65.000
		B-SUB10-PNL PP-201	Molded Case		17.547	5.5	1.027	18.020	0.480	20.00	65.000	65.000
		B-SUB10-PNL PP-301	Molded Case		17.547	5.5	1.027	18.020	0.480	20.00	65.000	65.000
SUB10 FEED	4.160	F-SUB10-FEED	Fuse		18.002	7.4	1.000	18.002	5.500	3.95	50.000	50.000
SUB10 LS	0.480	B-SUB10-MAIN	InsulUnfuse		17.547	5.5	1.027	18.020	0.480	20.00	65.000	65.000
SUB11 LS	0.480	B-SUB 11-SWBD 11	Molded Case		15.736	4.5	1.000	15.736	0.480	20.00	65.000	65.000
SUB12 LS	0.480	B-SUB 12-SWBD 12	Molded Case		17.482	4.8	1.000	17.482	0.480	20.00	65.000	65.000
SUBNATANT PUMP	0.480				9.432	1.1						
SUPERNANANT PS CP	0.480				5.965	1.2						
SWBD 11 BUS A	0.480	B-SWBD11-MAIN	Molded Case		14.393	4.2	1.000	14.393	0.480	20.00	65.000	65.000
		B-SWBD11-DEEP WELL PUMP 4	Molded Case		14.393	4.2	1.000	14.393	0.480	20.00	65.000	65.000
		B-SWBD11-DEEP WELL PUMP 5	Molded Case		14.393	4.2	1.000	14.393	0.480	20.00	65.000	65.000
		B-SWBD11-SPARE1	Molded Case		14.393	4.2	1.064	15.312	0.480	30.00	18.000	18.000
		B-SWBD11-SPARE2	Molded Case		14.393	4.2	1.064	15.312	0.480	30.00	18.000	18.000
		B-SWBD11-SPARE3	Molded Case		14.393	4.2	1.064	15.312	0.480	30.00	18.000	18.000
SWBD11 LS	0.480	B-SWBD11-MAIN	Molded Case		14.393	4.2	1.000	14.393	0.480	20.00	65.000	65.000
SWBD 12 BUS B	0.480	B-SWBD12-MAIN	Molded Case		16.275	4.6	1.000	16.275	0.480	20.00	65.000	65.000
		B-SWBD12-DEEP WELL PUMP 5	Molded Case		16.275	4.6	1.000	16.275	0.480	20.00	65.000	65.000
		B-SWBD12-DEEP WELL PUMP 6	Molded Case		16.275	4.6	1.000	16.275	0.480	20.00	65.000	65.000
		B-SWBD11-SPARE4	Molded Case		16.275	4.6	1.087	17.695	0.480	30.00	18.000	18.000
		B-SWBD11-SPARE5	Molded Case		16.275	4.6	1.087	17.695	0.480	30.00	18.000	18.000
		B-SWBD11-SPARE6	Molded Case		16.275	4.6	1.087	17.695	0.480	30.00	18.000	18.000
		B-SWBD11-SPARE7	Molded Case		16.275	4.6	1.087	17.695	0.480	30.00	18.000	18.000

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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty					Device Capability			
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
SWBD12 LS	0.480	B-SWBD12-MAIN	Molded Case		16.275	4.6	1.000	16.275	0.480	20.00	65.000	65.000
SWGR BUS A	4.160				17.712	11.3						
SWGR BUS B	4.160				17.711	11.3						
SWGR MAIN 1 LS	4.160				17.711	11.3						
SWGR MAIN 2 LS	4.160				17.712	11.3						
SWITCH 11	4.160	F-SW11-XFMR	Fuse		17.723	6.9	1.000	17.723	5.500	6.70	65.000	65.000
SWITCH 12	4.160	F-SW12-XFMR	Fuse		17.877	7.1	1.000	17.877	5.500	6.70	65.000	65.000
T-AC-1	0.480				1.183	0.1						
T-BLOWER AB1	4.160				8.092	1.8						
T-BLOWER AB2	4.160				8.186	1.9						
T-BLOWER AB3	4.160				8.281	2.0						
T-BLOWER AB4	4.160				8.355	2.0						
T-BLOWER AB5	4.160				8.451	2.1						
T-DEEP WELL PUMP 1	0.480				10.223	4.6						
T-DEEP WELL PUMP 2	0.480				10.490	4.5						
T-DEEP WELL PUMP 3	0.480				10.743	4.4						
T-DEEP WELL PUMP 4	0.480				9.571	4.6						
T-DEEP WELL PUMP 5	0.480				10.047	4.4						
T-DEEP WELL PUMP 6	0.480				10.084	4.4						
T-DP1-WAS PUMP 5	0.480				1.423	0.2						
T-DP1-WAS PUMP 6	0.480				1.423	0.2						
T-DP2-WAS PUMP 1	0.480				2.826	0.3						
T-DP2-WAS PUMP 2	0.480				2.826	0.3						
T-GEN 1	4.160				2.083	19.0						
T-GEN 2	4.160				2.340	19.0						
T-MCC D4-BLOWER 1	0.480				6.007	1.5						
T-MCC D4-BLOWER 3	0.480				6.611	1.5						
T-MCC D4-PMP 1	0.480				4.674	1.0						
T-MCC D4-PMP 3	0.480				5.334	1.0						
T-MCC D5-BLOWER 2	0.480				5.398	1.4						
T-MCC D5-BLOWER 4	0.480				6.605	1.5						
T-MCC D5-PMP 2	0.480				4.156	0.9						
T-MCC D5-PMP 4	0.480				5.331	1.0						
T-MCCD1-PNL LD	0.208				1.667	1.5						

Project: MANATEE COUNTY ESS  
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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
T-MCCDW1-PNL LDW	0.208				1.787	1.6						
T-MCCHW1-PNL LHW 2	0.208				1.960	1.7						
T-SUB2-PNL CP	0.208	B-SUB2-PNL CP (2)	Molded Case		1.287	1.1	1.000	1.287	0.480	30.00	18.000	18.000
T-SUB11-SWBD11	0.480	B-SUB 11-SWBD 11	Molded Case		15.736	4.5	1.000	15.736	0.480	20.00	65.000	65.000
T-SUB12-SWBD12	0.480	B-SUB 12-SWBD 12	Molded Case		17.482	4.8	1.000	17.482	0.480	20.00	65.000	65.000
T-TR-DP1-XLC	0.480	B-DP1-XLC (2)	Molded Case		7.048	1.2	1.000	7.048	0.480	30.00	18.000	18.000
T-TR-DP4-XLC	0.480	B-DP4-XLC (2)	Molded Case		7.147	1.2	1.000	7.147	0.480	30.00	18.000	18.000
T-TR-MCC 1-PNL XFMR	0.480				5.714	0.9						
T-TR-MCC 1-PNL XFMR (2)	0.208				0.814	1.1						
T-TR-MCC B1-PNL XFMR	0.480				11.547	1.3						
T-TR-MCC B1-PNL XFMR2	0.208				1.768	1.7						
T-TR-MCC B2-PNL (2)	0.208				1.950	1.6						
T-TR-MCC B2-PNL LB1 (2)	0.208				1.931	1.6						
T-TR-MCC D1-PNL LD 2	0.480				6.690	0.9						
T-TR-MCC D1-PNL LD2 (2)	0.208				1.802	1.6						
T-TR-MCCB2-PNL LB1	0.480				8.387	0.9						
T-TR-MCCB2-PNL XFMR	0.480				9.642	1.3						
T-TR-MCCB4-PNL LP2	0.480				10.663	1.4						
T-TR-MCCB4-PNL LP2 (2)	0.208				0.838	1.1						
T-TR-MCCD1-PNL LD	0.480				5.714	0.8						
T-TR-MCCDW1-PNL LDW	0.480				7.392	0.8						
T-TR-MCCHW1-PNL LHW	0.480				10.309	1.5						
T-TR-SUB1/2-PNL L1 XFMR	0.480				10.887	2.0						
T-TR-SUB1/2-PNL L1 XFMR 2	0.208				4.061	1.7						
T-TR-SUB2-PNL CP XFMR	0.480				2.108	0.3						
T-TR-SUB2-PNL CP XFMR 2	0.208				1.312	1.1						
T-TR-T7A-PRI	4.160				8.418	2.3						
T-TR-T7A-SEC	0.480				13.228	4.1						
T-TR-T8A-PRI	4.160				8.418	2.3						
T-TR-T8A-SEC	0.480				13.202	4.1						
THICK WAS 3 AFD	0.480				13.800	2.9						
THICK WAS 4 AFD	0.480				13.800	2.9						
VALVE OPERATOR	0.480				5.126	0.4						

Project: MANATEE COUNTY ESS  
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3-Phase Fault Currents: (Prefault Voltage = 100 % of the Bus Nominal Voltage)

Bus		Device		Interrupting Duty				Device Capability				
ID	kV	ID	Type	CPT (Cy)	Symm. kA rms	X/R Ratio	M.F.	Adj. Sym. kA rms	kV	Test PF	Rated Int.	Adjusted Int.
WATER HEATER	0.480				10.270	1.4						

Method: IEEE - X/R is calculated from separate R & X networks.

HV CB interrupting capability is adjusted based on bus nominal voltage

Short-circuit multiplying factor for LV Molded Case and Insulated Case Circuit Breakers is calculated based on asymmetrical current.

Generator protective device duty is calculated based on maximum through fault current. Other protective device duty is calculated based on total fault current.

\* Indicates a device with interrupting duty exceeding the device capability

\*\* Indicates that the circuit breaker has been flagged as a generator circuit breaker. However, ETAP could not detect a single path, without a transformer, to the specified generator. Therefore, this circuit breaker is treated as a regular circuit breaker in short-circuit calculations.

+ The prefault voltage exceeds the rated maximum kV limit of the circuit breaker - The rated interrupting kA must be derated.

**APPENDIX B3 – SHORT CIRCUIT STUDY  
(1/2 CYCLE SHORT-CIRCUIT SUMMARY REPORT)**

Project: MANATEE COUNTY ESS  
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**Short-Circuit Summary Report**

1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
54" METER VAULT VALVE	0.48	0.931	-0.115	0.938	0.549	-0.049	0.551	0.099	0.806	0.812	-0.294	-0.791	0.844
A/C ROOF UNIT #2	0.48	4.572	-2.748	5.334	3.238	-1.314	3.494	2.380	3.960	4.620	-3.606	-3.566	5.072
ABFV-1	0.48	3.859	-2.446	4.569	2.667	-1.253	2.947	2.118	3.342	3.957	-3.122	-2.941	4.289
ABFV-2	0.48	3.516	-1.884	3.989	2.342	-0.927	2.519	1.632	3.045	3.455	-2.500	-2.753	3.719
ABFV-3	0.48	3.198	-1.488	3.527	2.075	-0.712	2.194	1.289	2.769	3.055	-2.051	-2.547	3.270
ABFV-4	0.48	2.916	-1.202	3.154	1.857	-0.564	1.941	1.041	2.525	2.731	-1.718	-2.351	2.911
ABFV-5	0.48	2.670	-0.990	2.848	1.677	-0.458	1.738	0.858	2.313	2.467	-1.465	-2.172	2.620
ABW #1 EFF. WEIR GATE	0.48	0.931	-0.115	0.938	0.549	-0.049	0.551	0.099	0.806	0.812	-0.294	-0.791	0.844
ABW #1 FESTON SYSTEM	0.48	2.151	-0.651	2.247	1.323	-0.290	1.355	0.564	1.863	1.946	-1.039	-1.775	2.057
ABW #1 INF. WEIR GATE	0.48	0.970	-0.122	0.977	0.572	-0.052	0.575	0.106	0.840	0.846	-0.309	-0.824	0.880
ABW #1 SLUICE GATE #1	0.48	0.592	-0.047	0.594	0.347	-0.020	0.348	0.041	0.512	0.514	-0.164	-0.507	0.532
ABW #3 FESTON SYSTEM	0.48	2.067	-0.622	2.159	1.272	-0.275	1.302	0.539	1.790	1.870	-0.996	-1.707	1.977
ABW #3,4,5 FESTON SYSTEM	0.48	1.287	-0.238	1.309	0.768	-0.103	0.775	0.206	1.115	1.134	-0.480	-1.084	1.186
ABW 3,4,5 FLOCCULATOR	0.48	0.568	-0.044	0.569	0.333	-0.019	0.333	0.038	0.492	0.493	-0.156	-0.486	0.510
ABW #3,4,6 FESTON SYSTEM	0.48	1.337	-0.249	1.360	0.798	-0.108	0.805	0.215	1.158	1.178	-0.499	-1.126	1.231
ABW #3,4,6 SLUICE GATE	0.48	0.861	-0.101	0.867	0.508	-0.043	0.509	0.088	0.746	0.751	-0.268	-0.733	0.780
ABW #5 SLUICE GATE	0.48	0.931	-0.115	0.938	0.549	-0.049	0.551	0.099	0.806	0.812	-0.294	-0.791	0.844
ABW #6 FESTON SYSTEM	0.48	2.073	-0.613	2.162	1.272	-0.274	1.301	0.531	1.795	1.872	-0.988	-1.712	1.977
ABW #6 SLUICE GATE	0.48	0.895	-0.108	0.901	0.528	-0.046	0.530	0.093	0.775	0.780	-0.280	-0.761	0.811
ABW 6,7 FLASH MIXER #3	0.48	0.801	-0.092	0.807	0.472	-0.039	0.474	0.080	0.694	0.699	-0.247	-0.682	0.726
ABW #7 FESTON SYSTEM	0.48	1.864	-0.527	1.938	1.140	-0.234	1.164	0.457	1.615	1.678	-0.866	-1.544	1.770
ABW FILTER #2	0.48	1.995	-0.587	2.080	1.225	-0.260	1.252	0.509	1.728	1.801	-0.949	-1.649	1.903
ABW SLUICE GATE	0.48	0.568	-0.044	0.569	0.333	-0.019	0.333	0.038	0.492	0.493	-0.156	-0.486	0.510
ACU-1	0.48	4.180	-4.976	6.498	3.426	-3.116	4.631	4.309	3.620	5.628	-5.714	-2.519	6.245
AFD-MCC D1-THICKENER	0.48	5.002	-4.529	6.748	4.031	-2.576	4.783	3.923	4.332	5.844	-5.548	-3.490	6.554
AIR COMPRESSOR	0.48	6.931	-6.212	9.308	5.713	-3.456	6.677	5.380	6.003	8.061	-7.698	-4.907	9.129
AIR COMPRESSOR 2	0.48	6.799	-5.647	8.838	5.434	-3.038	6.225	4.890	5.888	7.654	-7.061	-4.940	8.618
BASIN 1 ADFV 13	0.48	2.720	-0.719	2.814	1.684	-0.287	1.709	0.622	2.356	2.437	-1.229	-2.277	2.587
BASIN 2 ADFV 14	0.48	2.216	-0.491	2.269	1.350	-0.196	1.364	0.425	1.919	1.965	-0.909	-1.864	2.074
BASIN 3 ADFV 15	0.48	1.760	-0.326	1.790	1.059	-0.130	1.067	0.282	1.525	1.550	-0.660	-1.488	1.628
BASIN 4 ADFV 16	0.48	1.458	-0.235	1.477	0.871	-0.095	0.876	0.204	1.263	1.279	-0.514	-1.236	1.338

Project: MANATEE COUNTY ESS  
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1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
BELT FILTER PRESS 1	0.48	5.133	-3.424	6.170	3.829	-1.701	4.190	2.965	4.445	5.344	-4.448	-3.934	5.938
BELT FILTER PRESS 2	0.48	5.039	-3.445	6.105	3.804	-1.717	4.173	2.984	4.364	5.287	-4.463	-3.850	5.895
BELT FILTER PRESS 3	0.48	5.505	-4.492	7.105	4.474	-2.415	5.084	3.890	4.768	6.153	-5.691	-4.024	6.970
BELT FILTER PRESS 4	0.48	5.636	-4.485	7.203	4.514	-2.396	5.111	3.884	4.881	6.238	-5.691	-4.141	7.038
BELT FILTER PRESS 5	0.48	6.028	-6.077	8.560	5.370	-3.649	6.492	5.263	5.221	7.413	-7.539	-4.031	8.549
BELT FILTER PRESS 6	0.48	6.027	-6.073	8.556	5.369	-3.648	6.491	5.260	5.219	7.410	-7.536	-4.030	8.545
BLOWER #6 INLET VALVE	0.48	4.109	-5.987	7.261	3.575	-4.018	5.378	5.185	3.558	6.289	-6.706	-2.082	7.022
BLOWER A LS	4.16	3.545	-9.025	9.697	3.451	-5.192	6.234	7.816	3.070	8.398	-9.247	-1.319	9.341
BLOWER B LS	4.16	3.529	-9.161	9.817	3.441	-5.176	6.215	7.933	3.056	8.502	-9.351	-1.324	9.444
BLOWER BUS A	4.16	3.545	-9.025	9.697	3.451	-5.192	6.234	7.816	3.070	8.398	-9.247	-1.319	9.341
BLOWER BUS B	4.16	3.529	-9.161	9.817	3.441	-5.176	6.215	7.933	3.056	8.502	-9.351	-1.324	9.444
CLARIFIER 1 CP	0.48	1.464	-0.304	1.495	0.876	-0.134	0.886	0.263	1.268	1.295	-0.575	-1.227	1.356
CLARIFIER 2 CP	0.48	1.470	-0.313	1.503	0.882	-0.136	0.893	0.271	1.273	1.302	-0.586	-1.232	1.365
CLARIFIER 5 CP	0.48	1.461	-0.305	1.493	0.874	-0.134	0.884	0.264	1.266	1.293	-0.575	-1.225	1.353
CONVEYOR CP	0.48	4.278	-2.064	4.750	2.927	-0.914	3.066	1.787	3.705	4.113	-2.880	-3.445	4.490
D-DP1-RAS PUMP 7	0.48	4.275	-4.796	6.425	3.488	-2.856	4.508	4.154	3.702	5.564	-5.570	-2.728	6.202
D-DP1-RAS PUMP 8	0.48	4.275	-4.796	6.425	3.488	-2.856	4.508	4.154	3.702	5.564	-5.570	-2.728	6.202
D-DP1-WAS 5	0.48	4.615	-4.097	6.171	3.546	-2.262	4.206	3.548	3.997	5.345	-4.944	-3.257	5.920
D-DP1-WAS 6	0.48	4.615	-4.097	6.171	3.546	-2.262	4.206	3.548	3.997	5.345	-4.944	-3.257	5.920
D-DP2-RAS PUMP 1	0.48	4.070	-3.688	5.493	3.079	-2.025	3.685	3.194	3.525	4.757	-4.397	-2.861	5.245
D-DP2-RAS PUMP 3	0.48	4.070	-3.688	5.493	3.079	-2.025	3.685	3.194	3.525	4.757	-4.397	-2.861	5.245
D-DP2-WAS 1	0.48	4.653	-4.127	6.220	3.580	-2.278	4.243	3.574	4.030	5.386	-4.984	-3.286	5.970
D-DP2-WAS 2	0.48	4.653	-4.127	6.220	3.580	-2.278	4.243	3.574	4.030	5.386	-4.984	-3.286	5.970
D-DP4-RAS PUMP 2	0.48	4.170	-5.490	6.894	3.664	-3.510	5.074	4.755	3.611	5.971	-6.306	-2.373	6.738
D-DP4-WAS 2	0.48	4.570	-4.298	6.273	3.637	-2.431	4.375	3.722	3.958	5.433	-5.178	-3.158	6.065
D-DP4-WAS PUMP 2	0.48	2.685	-0.959	2.851	1.682	-0.417	1.733	0.830	2.325	2.469	-1.438	-2.202	2.630
D-MCC 1-EXHAUST 1	0.48	2.673	-0.993	2.852	1.678	-0.459	1.739	0.860	2.315	2.470	-1.468	-2.174	2.623
D-MCC 1-EXHAUST 2	0.48	2.673	-0.993	2.852	1.678	-0.459	1.739	0.860	2.315	2.470	-1.468	-2.174	2.623
D-MCC 1-EXHAUST 3	0.48	2.673	-0.993	2.852	1.678	-0.459	1.739	0.860	2.315	2.470	-1.468	-2.174	2.623
D-MCC 1-EXHAUST 4	0.48	2.673	-0.993	2.852	1.678	-0.459	1.739	0.860	2.315	2.470	-1.468	-2.174	2.623
D-MCC B1-AIR BLOWER	0.48	5.819	-10.030	11.596	5.996	-7.274	9.427	8.687	5.040	10.043	-11.491	-2.313	11.721
D-MCC B1-DAF THICK 2	0.48	2.930	-0.698	3.012	1.789	-0.279	1.811	0.605	2.538	2.609	-1.246	-2.460	2.757
D-MCC B1-EAST DAF RECYC	0.48	5.901	-9.587	11.257	5.947	-6.753	8.998	8.302	5.110	9.749	-11.032	-2.630	11.341
D-MCC B1-PRESSURIZATION	0.48	5.926	-7.010	9.179	5.190	-4.228	6.694	6.071	5.132	7.949	-8.242	-3.712	9.039

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1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
D-MCC B1-THICK WAS 3	0.48	6.065	-7.414	9.579	5.433	-4.692	7.179	6.421	5.253	8.295	-8.739	-3.630	9.463
D-MCC B1-THICK WAS 4	0.48	6.065	-7.414	9.579	5.433	-4.692	7.179	6.421	5.253	8.295	-8.739	-3.630	9.463
D-MCC B1-WEST DAF RECYC	0.48	5.901	-9.587	11.257	5.947	-6.753	8.998	8.302	5.110	9.749	-11.032	-2.630	11.341
D-MCC B2-AIR COMPRESSOR	0.48	5.386	-3.840	6.615	4.095	-1.917	4.522	3.326	4.664	5.728	-4.921	-4.090	6.399
D-MCC B2-EQ DIVERSION VLV	0.48	2.749	-0.678	2.831	1.694	-0.263	1.714	0.587	2.381	2.452	-1.197	-2.310	2.601
D-MCC B2-RETURN SLUDGE 1	0.48	3.970	-1.773	4.348	2.618	-0.739	2.721	1.535	3.438	3.765	-2.497	-3.233	4.085
D-MCC B2-RETURN SLUDGE 2	0.48	4.890	-2.735	5.603	3.438	-1.218	3.647	2.369	4.235	4.853	-3.662	-3.891	5.343
D-MCC B2-RETURN SLUDGE 3	0.48	4.394	-2.171	4.901	2.976	-0.930	3.118	1.880	3.806	4.245	-2.984	-3.546	4.634
D-MCC B2-RETURN SLUDGE 4	0.48	4.394	-2.171	4.901	2.976	-0.930	3.118	1.880	3.806	4.245	-2.984	-3.546	4.634
D-MCC B2-RETURN SLUDGE 5	0.48	3.970	-1.773	4.348	2.618	-0.739	2.721	1.535	3.438	3.765	-2.497	-3.233	4.085
D-MCC B3-STANDBY PRESSURE	0.48	5.890	-8.122	10.033	5.549	-5.342	7.703	7.033	5.101	8.688	-9.468	-3.218	10.000
D-MCC D1-BFP FEED PUMP	0.48	3.337	-1.463	3.644	2.173	-0.654	2.269	1.267	2.890	3.156	-2.063	-2.697	3.396
D-MCC D1-BFP FEED PUMP5	0.48	3.461	-1.711	3.861	2.298	-0.793	2.431	1.482	2.998	3.344	-2.331	-2.758	3.612
D-MCC D1-GRAVITY THICK	0.48	1.766	-0.373	1.805	1.065	-0.156	1.077	0.323	1.529	1.563	-0.703	-1.484	1.642
D-MCC D1-SLUDGE RECIRC 1	0.48	4.553	-3.947	6.026	3.549	-2.200	4.175	3.418	3.943	5.219	-4.827	-3.225	5.805
D-MCC D1-SLUDGE RECIRC 3	0.48	4.362	-3.394	5.527	3.271	-1.815	3.741	2.939	3.777	4.786	-4.214	-3.196	5.288
D-MCC D1-SLUDGE RECIRC 4	0.48	4.155	-2.945	5.093	3.020	-1.524	3.383	2.551	3.598	4.411	-3.711	-3.116	4.845
D-MCC D1-SLUDGE TRANSFER1	0.48	4.697	-4.650	6.609	3.843	-2.726	4.712	4.027	4.068	5.724	-5.591	-3.156	6.420
D-MCC D1-THICKENER	0.48	1.775	-0.393	1.818	1.068	-0.160	1.080	0.340	1.537	1.574	-0.721	-1.491	1.656
D-MCC D2-BFP FEED PUMP1	0.48	3.979	-2.299	4.595	2.768	-1.097	2.977	1.991	3.446	3.980	-3.033	-3.115	4.347
D-MCC D2-BFP FEED PUMP4	0.48	3.110	-1.306	3.373	2.011	-0.575	2.091	1.131	2.693	2.921	-1.866	-2.525	3.140
D-MCC D2-BFP FEED PUMP6	0.48	2.780	-1.039	2.967	1.761	-0.447	1.817	0.900	2.407	2.570	-1.539	-2.277	2.748
D-MCC D2-SLUDGE RECIRC 2	0.48	3.859	-2.293	4.488	2.690	-1.109	2.909	1.985	3.342	3.887	-2.999	-3.003	4.244
D-MCC D2-SLUDGE TRANSFER2	0.48	1.854	-0.518	1.925	1.123	-0.206	1.142	0.448	1.606	1.667	-0.849	-1.548	1.765
D-MCC D2-SLUDGE TRANSFER3	0.48	3.558	-1.918	4.042	2.409	-0.894	2.570	1.661	3.081	3.500	-2.557	-2.813	3.801
D-MCC D2-SLUDGE TRANSFER4	0.48	4.845	-4.660	6.722	3.953	-2.700	4.787	4.036	4.196	5.822	-5.641	-3.302	6.536
D-MCC DW1-PLANT DRAIN1	0.48	2.132	-0.624	2.222	1.301	-0.244	1.323	0.541	1.847	1.924	-1.006	-1.779	2.044
D-MCC DW1-PLANT DRAIN2	0.48	2.132	-0.624	2.222	1.301	-0.244	1.323	0.541	1.847	1.924	-1.006	-1.779	2.044
D-MCC DW1-PLANT DRAIN3	0.48	2.132	-0.624	2.222	1.301	-0.244	1.323	0.541	1.847	1.924	-1.006	-1.779	2.044
D-MCC E1-EF-7	0.48	2.569	-0.662	2.653	1.573	-0.271	1.597	0.573	2.225	2.297	-1.138	-2.147	2.430



Project: MANATEE COUNTY ESS  
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1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
D-MCC E1-FLASH MIXER 1	0.48	0.524	-0.082	0.530	0.301	-0.025	0.302	0.071	0.454	0.459	-0.176	-0.448	0.481
D-MCC E1-FLASH MIXER 2	0.48	0.880	-0.147	0.892	0.513	-0.053	0.515	0.127	0.762	0.772	-0.308	-0.748	0.808
D-MCC E2-EF-5.1	0.48	1.636	-0.270	1.658	0.976	-0.106	0.982	0.234	1.417	1.436	-0.581	-1.387	1.504
D-MCC E2-EF-5.2	0.48	1.636	-0.270	1.658	0.976	-0.106	0.982	0.234	1.417	1.436	-0.581	-1.387	1.504
D-MCC HW1-CONVEYOR EAST	0.48	3.782	-1.386	4.028	2.435	-0.567	2.500	1.200	3.275	3.488	-2.088	-3.119	3.753
D-MCC HW1-FINAL CLAR. 3	0.48	0.268	-0.014	0.269	0.156	-0.005	0.156	0.012	0.232	0.233	-0.067	-0.231	0.240
D-MCC HW1-FINAL CLAR. 4	0.48	0.272	-0.014	0.273	0.158	-0.006	0.158	0.012	0.236	0.236	-0.068	-0.234	0.244
D-MCC HW1-GRIT CLASS WEST	0.48	1.217	-0.153	1.227	0.720	-0.060	0.722	0.133	1.054	1.062	-0.388	-1.037	1.108
D-MCC HW1-PRI. SLUDGE	0.48	0.384	-0.026	0.385	0.224	-0.011	0.224	0.023	0.333	0.333	-0.101	-0.329	0.345
D-MCC HW1-RSP 4	0.48	3.540	-2.329	4.237	2.458	-1.135	2.708	2.017	3.066	3.670	-2.940	-2.715	4.002
D-MCC HW1-RSP 5	0.48	3.540	-2.329	4.237	2.458	-1.135	2.708	2.017	3.066	3.670	-2.940	-2.715	4.002
D-MCC HW1-WEST CONVEYOR	0.48	1.172	-0.152	1.182	0.691	-0.058	0.693	0.131	1.015	1.023	-0.376	-0.999	1.067
D-MCC HW2-GRIT CLASS 2	0.48	1.854	-0.332	1.883	1.113	-0.129	1.120	0.287	1.606	1.631	-0.684	-1.570	1.713
D-MCC HW2-GRIT PUMP 2	0.48	3.274	-1.123	3.462	2.065	-0.444	2.112	0.973	2.836	2.998	-1.719	-2.715	3.214
D-MCC HW2-PRI. SLUDGE 1	0.48	0.528	-0.041	0.530	0.308	-0.017	0.309	0.036	0.457	0.459	-0.145	-0.452	0.475
D-MCC HW2-PRI. SLUDGE 3	0.48	0.528	-0.041	0.530	0.308	-0.017	0.309	0.036	0.457	0.459	-0.145	-0.452	0.475
D-MCC HW2-RSP 6	0.48	3.496	-2.330	4.202	2.434	-1.140	2.688	2.018	3.028	3.639	-2.932	-2.675	3.969
D-MCC HW2-WAS PUMP 3	0.48	0.843	-0.118	0.851	0.493	-0.045	0.495	0.102	0.730	0.737	-0.276	-0.718	0.769
D-MCC HW2-WAS PUMP 4	0.48	0.843	-0.118	0.851	0.493	-0.045	0.495	0.102	0.730	0.737	-0.276	-0.718	0.769
D-MCCB4-SUBM PUMP START	0.48	2.155	-0.574	2.230	1.313	-0.230	1.333	0.497	1.866	1.931	-0.967	-1.801	2.044
DAF THICKENER 2 AFD	0.48	6.578	-4.279	7.847	4.858	-2.069	5.280	3.705	5.697	6.796	-5.575	-5.086	7.546
DAVIS SCRUBBER	0.48	5.308	-6.434	8.341	4.878	-4.130	6.392	5.572	4.597	7.223	-7.685	-3.170	8.313
DEEP WELL PUMP 1 VFD	0.48	3.180	-14.829	15.166	3.412	-14.213	14.617	12.842	2.754	13.134	-14.643	4.061	15.195
DEEP WELL PUMP 2 VFD	0.48	3.605	-15.756	16.163	3.881	-14.090	14.614	13.645	3.122	13.997	-15.644	3.230	15.973
DEEP WELL PUMP 3 VFD	0.48	3.398	-16.719	17.061	3.517	-15.573	15.966	14.479	2.943	14.775	-16.269	4.339	16.838
DEEP WELL PUMP 4 VFD	0.48	3.613	-13.517	13.991	3.888	-12.156	12.763	11.706	3.129	12.117	-13.714	2.372	13.917
DEEP WELL PUMP 5 VFD	0.48	3.914	-14.946	15.450	4.167	-12.699	13.365	12.944	3.389	13.380	-15.031	2.101	15.177
DEEP WELL PUMP 6 VFD	0.48	3.876	-15.265	15.749	4.119	-13.146	13.776	13.220	3.357	13.639	-15.293	2.389	15.478
DEGRITTER CP	0.48	2.880	-0.827	2.997	1.790	-0.333	1.821	0.716	2.494	2.595	-1.361	-2.402	2.761
DP1 MAIN LS	0.48	3.670	-7.789	8.611	3.602	-5.822	6.846	6.746	3.178	7.457	-8.405	-0.896	8.452
DP2 MAIN LS	0.48	3.678	-7.884	8.699	3.625	-5.919	6.941	6.827	3.185	7.534	-8.503	-0.858	8.546
DP4 MAIN LS	0.48	3.325	-7.986	8.651	3.385	-6.283	7.136	6.916	2.880	7.492	-8.529	-0.328	8.535
EFF. FILTER PS CNTRL	0.48	3.805	-7.542	8.447	3.811	-5.708	6.863	6.531	3.295	7.315	-8.313	-1.051	8.379

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1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

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Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
ELECTRIC ROLL-UP DOOR	0.48	3.198	-1.488	3.527	2.075	-0.712	2.194	1.289	2.769	3.055	-2.051	-2.547	3.270
EQ TANK RETURN	0.48	2.505	-0.567	2.569	1.534	-0.219	1.550	0.491	2.170	2.225	-1.042	-2.110	2.354
FPL PRIMARY	23.00	0.167	-1.349	1.359	0.000	0.000	0.000	1.168	0.145	1.177	1.168	0.145	1.177
FPL SERVICE	4.16	1.874	-19.335	19.426	2.404	-24.865	24.981	16.745	1.623	16.823	15.068	19.035	24.278
HOIST	0.48	5.908	-3.999	7.134	4.520	-1.950	4.923	3.463	5.116	6.178	-5.228	-4.551	6.931
LIGHTING PANEL	0.21	0.987	-1.250	1.593	1.024	-1.105	1.506	1.083	0.854	1.379	-1.602	-0.369	1.643
LTG. PNL	0.21	1.025	-1.602	1.902	1.060	-1.608	1.926	1.388	0.888	1.647	-1.936	-0.081	1.938
MAIN GATE CP	0.48	0.751	-0.081	0.755	0.442	-0.034	0.443	0.070	0.650	0.654	-0.227	-0.640	0.679
MCC 1	0.48	4.086	-6.053	7.303	3.568	-4.084	5.423	5.242	3.538	6.324	-6.764	-2.033	7.063
MCC B1	0.48	3.556	-14.162	14.601	3.714	-13.318	13.826	12.264	3.079	12.645	-14.173	3.198	14.530
MCC B2	0.48	3.248	-12.788	13.194	3.391	-12.825	13.266	11.075	2.813	11.427	-12.843	3.617	13.343
MCC B3	0.48	3.645	-13.677	14.155	3.795	-12.838	13.387	11.845	3.157	12.258	-13.790	2.883	14.088
MCC B4	0.48	3.255	-12.732	13.141	3.395	-12.787	13.230	11.026	2.819	11.381	-12.795	3.601	13.292
MCC D1	0.48	3.511	-8.932	9.597	3.595	-7.448	8.270	7.735	3.040	8.311	-9.491	0.125	9.491
MCC D2	0.48	3.378	-8.677	9.311	3.506	-7.297	8.096	7.515	2.925	8.064	-9.245	0.193	9.247
MCC D4 LS	0.48	3.266	-12.013	12.449	3.390	-11.507	11.996	10.404	2.829	10.781	-12.146	2.687	12.440
MCC D5 LS	0.48	3.258	-11.987	12.422	3.384	-11.491	11.979	10.381	2.821	10.758	-12.122	2.691	12.417
MCC DW1	0.48	3.438	-12.391	12.859	3.557	-12.383	12.884	10.731	2.977	11.137	-12.570	3.209	12.973
MCC DW2	0.48	3.288	-12.008	12.450	3.451	-12.126	12.607	10.399	2.847	10.782	-12.209	3.274	12.641
MCC E1	0.48	3.153	-12.401	12.795	3.369	-11.638	12.116	10.739	2.731	11.081	-12.499	2.741	12.796
MCC E2	0.48	2.972	-12.074	12.434	3.232	-11.576	12.019	10.456	2.574	10.768	-12.179	2.975	12.537
MCC HW 1	0.48	3.046	-12.834	13.190	3.201	-12.765	13.161	11.114	2.638	11.423	-12.791	3.709	13.318
MCC HW 2	0.48	3.031	-12.413	12.778	3.229	-12.195	12.615	10.750	2.625	11.066	-12.456	3.362	12.902
MCC-D4	0.48	3.266	-12.013	12.449	3.390	-11.507	11.996	10.404	2.829	10.781	-12.146	2.687	12.440
MCC-D5	0.48	3.258	-11.987	12.422	3.384	-11.491	11.979	10.381	2.821	10.758	-12.122	2.691	12.417
MCC1 LS	0.48	4.086	-6.053	7.303	3.568	-4.084	5.423	5.242	3.538	6.324	-6.764	-2.033	7.063
MCCB1 LS	0.48	3.556	-14.162	14.601	3.714	-13.318	13.826	12.264	3.079	12.645	-14.173	3.198	14.530
MCCD1 LS	0.48	3.511	-8.932	9.597	3.595	-7.448	8.270	7.735	3.040	8.311	-9.491	0.125	9.491
MCCD2 LS	0.48	3.378	-8.677	9.311	3.506	-7.297	8.096	7.515	2.925	8.064	-9.245	0.193	9.247
MECH SCREEN CP	0.48	2.526	-0.586	2.593	1.539	-0.224	1.555	0.508	2.187	2.245	-1.059	-2.127	2.376
MOV RATE OF FLOW	0.48	0.861	-0.103	0.867	0.508	-0.044	0.510	0.089	0.746	0.751	-0.269	-0.733	0.781
MTS-AC1-LOAD	0.48	1.742	-0.321	1.771	1.040	-0.123	1.048	0.278	1.508	1.534	-0.648	-1.475	1.611
MTS-MCC D4 LINE	0.48	1.742	-0.321	1.771	1.040	-0.123	1.048	0.278	1.508	1.534	-0.648	-1.475	1.611
MTS-MCC D5-LINE	0.48	1.728	-0.295	1.753	1.036	-0.117	1.043	0.256	1.496	1.518	-0.625	-1.464	1.591

Project: MANATEE COUNTY ESS  
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1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
NEW MAINT. BLDG	0.48	3.611	-6.402	7.350	3.409	-4.729	5.830	5.545	3.127	6.366	-7.085	-1.288	7.201
OLD MAINTENANCE BLDG	0.48	3.890	-2.717	4.745	2.842	-1.416	3.175	2.353	3.369	4.110	-3.448	-2.920	4.518
PLANT DRAIN #3	0.48	3.738	-11.843	12.419	4.074	-11.466	12.169	10.256	3.237	10.755	-12.442	2.305	12.654
PLANT DRAIN PS CTL PNL	0.48	3.721	-6.608	7.584	3.552	-4.770	5.947	5.723	3.222	6.568	-7.325	-1.401	7.458
PMS-7A LS	4.16	3.629	-8.384	9.135	3.318	-4.814	5.847	7.260	3.143	7.911	-8.617	-1.511	8.749
PMS-8A LS	4.16	3.637	-8.416	9.168	3.324	-4.822	5.856	7.288	3.150	7.940	-8.646	-1.517	8.778
PNL CP	0.21	0.857	-0.928	1.263	0.872	-1.001	1.328	0.804	0.742	1.094	0.362	1.283	1.333
PNL DP #1	0.48	3.670	-7.789	8.611	3.602	-5.822	6.846	6.746	3.178	7.457	-8.405	-0.896	8.452
PNL DP #2	0.48	3.678	-7.884	8.699	3.625	-5.919	6.941	6.827	3.185	7.534	-8.503	-0.858	8.546
PNL DP #4	0.48	3.325	-7.986	8.651	3.385	-6.283	7.136	6.916	2.880	7.492	-8.529	-0.328	8.535
PNL L1	0.21	1.481	-2.026	2.509	1.363	-1.594	2.097	1.754	1.282	2.173	-2.374	-0.633	2.457
PNL LB1	0.21	1.042	-1.569	1.884	1.072	-1.585	1.913	1.359	0.903	1.631	-1.910	-0.103	1.913
PNL LC1/LC2	0.21	1.059	-1.465	1.808	1.107	-1.373	1.764	1.269	0.917	1.566	-1.840	-0.277	1.861
PNL LD	0.21	0.917	-1.371	1.649	0.939	-1.423	1.705	1.187	0.794	1.428	0.706	1.533	1.688
PNL LD 2	0.21	0.975	-1.466	1.761	1.007	-1.492	1.800	1.270	0.844	1.525	-1.790	-0.084	1.792
PNL LDW	0.21	0.970	-1.476	1.766	0.991	-1.517	1.812	1.278	0.840	1.530	0.772	1.621	1.795
PNL LHW	0.21	1.014	-1.649	1.936	1.046	-1.673	1.973	1.428	0.878	1.676	-1.968	-0.029	1.968
PNL LP1	0.21	0.542	-0.589	0.800	0.552	-0.590	0.807	0.510	0.470	0.693	-0.790	-0.175	0.809
PNL LP2	0.21	0.552	-0.602	0.817	0.559	-0.588	0.811	0.521	0.478	0.707	-0.803	-0.191	0.826
PNL P3	0.48	4.877	-10.446	11.528	5.577	-8.939	10.536	9.046	4.223	9.983	-11.981	-0.429	11.989
PNL PC/TC-2	0.21	1.036	-1.577	1.887	1.083	-1.547	1.889	1.366	0.898	1.634	-1.930	-0.140	1.935
PNL PC/TC-3	0.21	1.072	-1.433	1.790	1.113	-1.352	1.751	1.241	0.928	1.550	-1.814	-0.292	1.837
PNL PC/TC-4	0.21	0.998	-1.357	1.684	1.035	-1.309	1.669	1.175	0.864	1.458	-1.710	-0.234	1.725
PNL XLC	0.21	0.293	-0.489	0.570	0.296	-0.495	0.577	0.423	0.254	0.494	0.274	0.505	0.575
PNL XLC (2)	0.21	0.293	-0.489	0.570	0.295	-0.496	0.577	0.424	0.254	0.494	0.275	0.505	0.575
PNL-P1	0.48	3.824	-3.441	5.144	2.929	-1.940	3.513	2.980	3.312	4.455	-4.134	-2.667	4.920
PNL-P4	0.48	5.092	-5.664	7.616	4.441	-3.462	5.631	4.905	4.410	6.596	-6.770	-3.240	7.505
POLYMER FEED 5, 6	0.48	2.553	-0.666	2.638	1.579	-0.265	1.601	0.577	2.211	2.285	-1.146	-2.138	2.425
POLYMER FEED CP	0.48	2.315	-0.557	2.381	1.417	-0.220	1.434	0.483	2.005	2.062	-0.991	-1.944	2.182
POLYMER MIX CP	0.48	2.329	-0.555	2.394	1.420	-0.219	1.437	0.481	2.017	2.073	-0.990	-1.956	2.192
RAS 1 VFD	0.48	4.005	-7.164	8.208	3.803	-5.089	6.353	6.204	3.469	7.108	-7.906	-1.545	8.056
RAS 2 VFD	0.48	3.708	-7.302	8.189	3.663	-5.427	6.548	6.324	3.211	7.092	-8.015	-1.100	8.090
RAS 3 VFD	0.48	4.005	-7.164	8.208	3.803	-5.089	6.353	6.204	3.469	7.108	-7.906	-1.545	8.056
RAS 7 VFD	0.48	3.986	-7.082	8.127	3.769	-5.012	6.271	6.134	3.452	7.038	-7.815	-1.561	7.970

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1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
RAS 8 VFD	0.48	3.986	-7.082	8.127	3.769	-5.012	6.271	6.134	3.452	7.038	-7.815	-1.561	7.970
REUSE LIFT STATION PUMP	0.48	1.634	-0.261	1.655	0.975	-0.104	0.981	0.226	1.415	1.433	-0.573	-1.386	1.500
ROOF A/C #1	0.48	1.389	-0.264	1.414	0.830	-0.114	0.838	0.229	1.203	1.225	-0.524	-1.169	1.281
S-DEEP WELL 2 LOAD	0.48	3.399	-16.718	17.060	3.517	-15.573	15.965	14.479	2.944	14.775	-16.269	4.338	16.837
S-DEEP WELL 5 LOAD	0.48	3.846	-15.485	15.955	4.078	-13.459	14.063	13.410	3.331	13.818	-15.468	2.597	15.684
S-MCC D1-PNL LD	0.48	4.743	-4.026	6.221	3.709	-2.241	4.333	3.486	4.108	5.388	-4.961	-3.379	6.002
S-MCC D2-PNL LD	0.48	4.622	-4.012	6.120	3.660	-2.247	4.295	3.474	4.002	5.300	-4.938	-3.272	5.924
S-MCC DW1-PNL LDW	0.48	6.144	-5.446	8.210	5.235	-3.067	6.067	4.716	5.321	7.110	-6.877	-4.361	8.143
S-MCC DW2-PNL LDW	0.48	5.973	-5.436	8.076	5.176	-3.087	6.027	4.707	5.173	6.994	-6.860	-4.209	8.048
S-MCC HW1-PNL LHW	0.48	6.085	-8.858	10.747	6.405	-6.339	9.011	7.671	5.270	9.307	-10.700	-2.981	11.107
S-MCC HW2-PNL LHW	0.48	5.160	-10.013	11.264	5.859	-8.142	10.031	8.671	4.469	9.755	-11.674	-1.184	11.734
S-MCCB2-PNL LB1	0.48	6.321	-7.993	10.190	6.319	-5.380	8.300	6.922	5.474	8.825	-9.798	-3.615	10.444
S-MCCB2-PNL P3	0.48	4.382	-11.377	12.191	5.092	-10.421	11.599	9.853	3.795	10.558	-12.644	0.938	12.678
S-MCCB3-PNL LB1	0.48	6.863	-8.155	10.659	6.380	-5.237	8.254	7.062	5.943	9.231	-9.843	-4.148	10.681
S-MCCB3-PNL P3	0.48	4.891	-12.026	12.983	5.380	-10.314	11.632	10.415	4.236	11.243	-13.182	0.207	13.183
S-MCCE1-PNL P4	0.48	5.083	-5.069	7.178	4.179	-2.963	5.123	4.390	4.402	6.217	-6.092	-3.415	6.984
S-MCCE2-PNL P4	0.48	5.178	-6.362	8.203	4.727	-4.070	6.238	5.509	4.484	7.104	-7.549	-3.076	8.151
S-PNL L1-LOAD	0.48	4.659	-10.335	11.337	5.358	-8.677	10.198	8.950	4.035	9.818	-11.748	-0.413	11.756
S-PNL LB1-LOAD	0.48	6.321	-7.993	10.190	6.319	-5.380	8.300	6.922	5.474	8.825	-9.798	-3.615	10.444
S-PNL LD LOAD	0.48	4.622	-4.012	6.120	3.660	-2.247	4.295	3.474	4.002	5.300	-4.938	-3.272	5.924
S-PNL LDW LOAD	0.48	5.973	-5.436	8.076	5.176	-3.087	6.027	4.707	5.173	6.994	-6.860	-4.209	8.048
S-PNL LHW LOAD	0.48	5.160	-10.013	11.264	5.859	-8.142	10.031	8.671	4.469	9.755	-11.674	-1.184	11.734
S-PNL P1-LOAD	0.48	4.659	-10.335	11.337	5.358	-8.677	10.198	8.950	4.035	9.818	-11.748	-0.413	11.756
S-PNL P3-LOAD	0.48	4.382	-11.377	12.191	5.092	-10.421	11.599	9.853	3.795	10.558	-12.644	0.938	12.678
S-PNL P4-LOAD	0.48	5.178	-6.362	8.203	4.727	-4.070	6.238	5.509	4.484	7.104	-7.549	-3.076	8.151
S-SUB1-PNL L1	0.48	4.411	-11.885	12.678	5.154	-10.698	11.875	10.293	3.820	10.979	-13.099	0.961	13.135
S-SUB1-PNL P1	0.48	4.411	-11.885	12.678	5.154	-10.698	11.875	10.293	3.820	10.979	-13.099	0.961	13.135
S-SUB2-PNL L1	0.48	4.659	-10.335	11.337	5.358	-8.677	10.198	8.950	4.035	9.818	-11.748	-0.413	11.756
S-SUB2-PNL P1	0.48	4.659	-10.335	11.337	5.358	-8.677	10.198	8.950	4.035	9.818	-11.748	-0.413	11.756
S-SUB9-DEEP WELL 2	0.48	3.294	-14.404	14.776	3.532	-13.741	14.188	12.475	2.852	12.797	-14.335	3.706	14.806
S-SUB10-DEEP WELL 2	0.48	3.399	-16.718	17.060	3.517	-15.573	15.965	14.479	2.944	14.775	-16.269	4.338	16.837
S-SWBD11-DEEP WELL 5	0.48	3.621	-13.600	14.074	3.867	-12.373	12.963	11.778	3.136	12.188	-13.774	2.521	14.003
S-SWBD12-DEEP WELL 5	0.48	3.846	-15.485	15.955	4.078	-13.459	14.063	13.410	3.331	13.818	-15.468	2.597	15.684
SCUM EJECTOR CP	0.48	0.921	-0.150	0.933	0.536	-0.054	0.538	0.130	0.798	0.808	-0.318	-0.783	0.845

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1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
SEC CLARIFIERS 3, 4	0.48	0.683	-0.071	0.687	0.402	-0.031	0.403	0.062	0.592	0.595	-0.204	-0.583	0.617
SLUDGE THICKENER DRIVE	0.48	3.502	-1.172	3.693	2.234	-0.477	2.284	1.015	3.032	3.198	-1.828	-2.901	3.429
SLUICE GATE 2	0.48	0.592	-0.047	0.594	0.347	-0.020	0.348	0.041	0.512	0.514	-0.164	-0.507	0.532
SLUICE GATE #4	0.48	0.592	-0.047	0.594	0.347	-0.020	0.348	0.040	0.513	0.514	-0.163	-0.507	0.532
SODIUM BICARBONATE CP	0.48	4.382	-5.884	7.337	3.929	-3.940	5.565	5.096	3.795	6.354	-6.793	-2.366	7.193
SUB 1 BUS A	0.48	2.992	-14.071	14.385	3.036	-14.276	14.596	12.186	2.591	12.458	-13.727	4.653	14.494
SUB1 FEED	4.16	2.504	-17.925	18.099	4.492	-20.285	20.776	15.524	2.168	15.674	-19.362	9.278	21.470
SUB1 LS	0.48	2.992	-14.071	14.385	3.036	-14.276	14.596	12.186	2.591	12.458	-13.727	4.653	14.494
SUB1/SUB9	4.16	1.933	-19.270	19.367	2.585	-24.616	24.751	16.688	1.674	16.772	-18.619	15.357	24.135
SUB 2 BUS B	0.48	2.818	-13.602	13.891	2.915	-13.951	14.253	11.780	2.440	12.030	-13.289	4.719	14.102
SUB2 FEED	4.16	2.395	-18.203	18.359	4.202	-21.145	21.558	15.764	2.074	15.900	-19.451	10.348	22.032
SUB2 LS	0.48	2.818	-13.602	13.891	2.915	-13.951	14.253	11.780	2.440	12.030	-13.289	4.719	14.102
SUB2/SUB10	4.16	1.936	-19.267	19.364	2.588	-24.612	24.748	16.685	1.676	16.769	-18.617	15.353	24.131
SUB 3 BUS A	0.48	2.974	-13.527	13.850	3.025	-13.899	14.224	11.715	2.576	11.995	10.177	9.721	14.074
SUB3 FEED	4.16	3.437	-14.498	14.900	5.342	-12.056	13.187	12.556	2.976	12.903	-15.622	1.918	15.740
SUB3 MAIN LS	0.48	2.974	-13.527	13.850	3.025	-13.899	14.224	11.715	2.576	11.995	10.177	9.721	14.074
SUB 4 BUS B	0.48	2.934	-13.430	13.747	2.997	-13.830	14.151	11.631	2.541	11.905	10.100	9.668	13.982
SUB4 FEED	4.16	3.423	-14.539	14.937	5.336	-11.955	13.092	12.591	2.965	12.935	-15.628	1.845	15.736
SUB4 MAIN LS	0.48	2.934	-13.430	13.747	2.997	-13.830	14.151	11.631	2.541	11.905	10.100	9.668	13.982
SUB 5 BUS A	0.48	3.144	-13.335	13.701	3.146	-13.764	14.119	11.549	2.723	11.865	9.978	9.833	14.009
SUB5 FEED	4.16	3.660	-10.230	10.865	3.936	-6.305	7.432	8.859	3.170	9.409	-10.575	-0.990	10.622
SUB5 MAIN LS	0.48	3.144	-13.335	13.701	3.146	-13.764	14.119	11.549	2.723	11.865	9.978	9.833	14.009
SUB 6 BUS B	0.48	3.394	-15.077	15.454	3.303	-14.952	15.312	13.057	2.940	13.384	11.450	10.354	15.437
SUB6 FEED	4.16	3.637	-10.360	10.980	3.920	-6.270	7.395	8.972	3.149	9.509	-10.668	-1.002	10.715
SUB6 MAIN LS	0.48	3.394	-15.077	15.454	3.303	-14.952	15.312	13.057	2.940	13.384	11.450	10.354	15.437
SUB 7 BUS A	0.48	3.172	-12.737	13.126	3.173	-13.336	13.708	11.031	2.747	11.368	9.451	9.742	13.572
SUB7 FEED	4.16	3.542	-8.712	9.404	3.363	-4.990	6.017	7.544	3.067	8.144	-8.929	-1.384	9.036
SUB7 MAIN LS	0.48	3.172	-12.737	13.126	3.173	-13.336	13.708	11.031	2.747	11.368	9.451	9.742	13.572
SUB7/SUB11	4.16	1.936	-19.267	19.364	2.588	-24.612	24.748	16.685	1.676	16.769	-18.617	15.353	24.131
SUB 8 BUS B	0.48	3.322	-13.128	13.541	3.275	-13.619	14.007	11.369	2.877	11.727	9.763	9.949	13.939
SUB8 FEED	4.16	3.549	-8.746	9.439	3.368	-4.998	6.027	7.574	3.073	8.174	-8.960	-1.389	9.067
SUB8 MAIN LS	0.48	3.322	-13.128	13.541	3.275	-13.619	14.007	11.369	2.877	11.727	9.763	9.949	13.939
SUB8/SUB12	4.16	1.933	-19.270	19.367	2.585	-24.616	24.751	16.688	1.674	16.772	-18.619	15.357	24.135
SUB 9 BUS A	0.48	3.037	-15.437	15.733	3.088	-15.274	15.583	13.369	2.630	13.625	-14.937	4.926	15.728

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1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
SUB9 FEED	4.16	2.598	-17.663	17.854	4.723	-19.484	20.048	15.297	2.250	15.462	-19.211	8.341	20.944
SUB9 LS	0.48	3.037	-15.437	15.733	3.088	-15.274	15.583	13.369	2.630	13.625	-14.937	4.926	15.728
SUB 10 BUS B	0.48	3.262	-17.242	17.547	3.245	-16.408	16.725	14.932	2.825	15.197	-16.540	5.000	17.279
SUB10 FEED	4.16	2.542	-17.821	18.002	4.609	-19.903	20.430	15.434	2.201	15.590	-19.318	8.812	21.233
SUB10 LS	0.48	3.262	-17.242	17.547	3.245	-16.408	16.725	14.932	2.825	15.197	-16.540	5.000	17.279
SUB11 LS	0.48	3.525	-15.336	15.736	3.606	-15.181	15.603	13.282	3.053	13.628	-15.123	4.461	15.767
SUB12 LS	0.48	3.770	-17.070	17.482	3.780	-16.273	16.707	14.783	3.265	15.139	-16.670	4.507	17.269
SUBNATANT PUMP	0.48	6.460	-6.873	9.432	5.582	-4.147	6.954	5.952	5.594	8.169	-8.284	-4.206	9.290
SUPERANANT PS CP	0.48	3.821	-4.580	5.965	3.189	-2.903	4.312	3.967	3.309	5.166	-5.288	-2.280	5.758
SWBD 11 BUS A	0.48	3.568	-13.943	14.393	3.800	-12.838	13.388	12.075	3.090	12.464	-14.042	2.843	14.327
SWBD11 LS	0.48	3.568	-13.943	14.393	3.800	-12.838	13.388	12.075	3.090	12.464	-14.042	2.843	14.327
SWBD 12 BUS B	0.48	3.795	-15.826	16.275	4.001	-13.953	14.515	13.706	3.286	14.094	-15.730	2.933	16.001
SWBD12 LS	0.48	3.795	-15.826	16.275	4.001	-13.953	14.515	13.706	3.286	14.094	-15.730	2.933	16.001
SWGR BUS A	4.16	1.933	-19.270	19.367	2.585	-24.616	24.751	16.688	1.674	16.772	-18.619	15.357	24.135
SWGR BUS B	4.16	1.936	-19.267	19.364	2.588	-24.612	24.748	16.685	1.676	16.769	-18.617	15.353	24.131
SWGR MAIN 1 LS	4.16	1.936	-19.267	19.364	2.588	-24.612	24.748	16.685	1.676	16.769	-18.617	15.353	24.131
SWGR MAIN 2 LS	4.16	1.933	-19.270	19.367	2.585	-24.616	24.751	16.688	1.674	16.772	-18.619	15.357	24.135
SWITCH 11	4.16	2.649	-17.524	17.723	4.824	-19.092	19.692	15.176	2.294	15.349	-19.108	7.906	20.679
SWITCH 12	4.16	2.591	-17.688	17.877	4.721	-19.505	20.068	15.318	2.244	15.482	-19.233	8.354	20.969
T-AC-1	0.48	1.171	-0.170	1.183	0.689	-0.064	0.692	0.148	1.014	1.025	-0.391	-0.997	1.071
T-BLOWER AB1	4.16	4.334	-7.430	8.602	3.354	-4.221	5.391	6.435	3.753	7.449	-7.744	-2.309	8.081
T-BLOWER AB2	4.16	4.291	-7.578	8.708	3.367	-4.296	5.458	6.562	3.716	7.541	-7.882	-2.249	8.196
T-BLOWER AB3	4.16	4.242	-7.728	8.816	3.379	-4.374	5.527	6.692	3.674	7.635	-8.021	-2.184	8.313
T-BLOWER AB4	4.16	4.175	-7.768	8.819	3.401	-4.465	5.613	6.728	3.616	7.638	-8.079	-2.086	8.344
T-BLOWER AB5	4.16	4.118	-7.920	8.927	3.411	-4.548	5.685	6.859	3.566	7.731	-8.220	-2.012	8.463
T-DEEP WELL PUMP 1	0.48	3.332	-9.665	10.223	3.473	-6.838	7.669	8.370	2.886	8.854	-9.964	-0.297	9.968
T-DEEP WELL PUMP 2	0.48	3.587	-9.858	10.490	3.538	-6.642	7.525	8.537	3.107	9.085	-10.099	-0.653	10.121
T-DEEP WELL PUMP 3	0.48	3.628	-10.112	10.743	3.609	-6.903	7.790	8.757	3.142	9.304	-10.364	-0.573	10.380
T-DEEP WELL PUMP 4	0.48	3.311	-8.980	9.571	3.301	-6.126	6.959	7.777	2.868	8.289	-9.248	-0.592	9.267
T-DEEP WELL PUMP 5	0.48	3.567	-9.392	10.047	3.404	-6.132	7.013	8.134	3.089	8.701	-9.604	-0.859	9.643
T-DEEP WELL PUMP 6	0.48	3.575	-9.429	10.084	3.415	-6.168	7.050	8.166	3.096	8.733	-9.643	-0.851	9.680
T-DP1-WAS PUMP 5	0.48	1.397	-0.274	1.423	0.828	-0.113	0.836	0.237	1.210	1.233	-0.531	-1.176	1.291
T-DP1-WAS PUMP 6	0.48	1.397	-0.274	1.423	0.828	-0.113	0.836	0.237	1.210	1.233	-0.531	-1.176	1.291
T-DP2-WAS PUMP 1	0.48	2.671	-0.922	2.826	1.659	-0.404	1.708	0.799	2.313	2.447	-1.397	-2.193	2.600

Project: MANATEE COUNTY ESS  
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 Filename: SWWRF

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1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
T-DP2-WAS PUMP 2	0.48	2.671	-0.922	2.826	1.659	-0.404	1.708	0.799	2.313	2.447	-1.397	-2.193	2.600
T-GEN 1	4.16	0.110	-2.081	2.083	0.256	-3.084	3.095	1.833	0.149	1.839	-1.970	2.692	3.336
T-GEN 2	4.16	0.123	-2.337	2.340	0.267	-2.883	2.895	2.034	0.166	2.041	-2.180	1.723	2.778
T-MCC D4-BLOWER 1	0.48	3.806	-4.647	6.007	3.145	-2.716	4.155	4.024	3.296	5.202	-5.299	-2.381	5.810
T-MCC D4-BLOWER 3	0.48	4.024	-5.245	6.611	3.455	-3.192	4.704	4.542	3.485	5.725	-5.975	-2.389	6.435
T-MCC D4-PMP 1	0.48	3.591	-2.992	4.674	2.617	-1.519	3.026	2.591	3.110	4.048	-3.590	-2.632	4.451
T-MCC D4-PMP 3	0.48	3.965	-3.569	5.334	3.005	-1.885	3.547	3.091	3.434	4.620	-4.259	-2.832	5.114
T-MCC D5-BLOWER 2	0.48	3.542	-4.074	5.398	2.822	-2.290	3.634	3.528	3.067	4.675	-4.649	-2.308	5.191
T-MCC D5-BLOWER 4	0.48	4.018	-5.242	6.605	3.453	-3.192	4.702	4.540	3.479	5.720	-5.972	-2.384	6.430
T-MCC D5-PMP 2	0.48	3.265	-2.572	4.156	2.312	-1.268	2.637	2.228	2.827	3.599	-3.099	-2.432	3.939
T-MCC D5-PMP 4	0.48	3.960	-3.569	5.331	3.003	-1.886	3.546	3.091	3.429	4.617	-4.259	-2.827	5.112
T-MCCD1-PNL LD	0.21	0.914	-1.395	1.667	0.931	-1.466	1.737	1.208	0.791	1.444	0.734	1.563	1.727
T-MCCDW1-PNL LDW	0.21	0.966	-1.503	1.787	0.981	-1.566	1.848	1.302	0.837	1.548	0.804	1.654	1.839
T-MCCHW1-PNL LHW 2	0.21	1.007	-1.681	1.960	1.032	-1.730	2.015	1.456	0.872	1.697	0.926	1.763	1.992
T-SUB2-PNL CP	0.21	0.862	-0.956	1.287	0.877	-1.054	1.371	0.828	0.746	1.115	0.386	1.330	1.385
T-SUB11-SWBD11	0.48	3.525	-15.336	15.736	3.606	-15.181	15.603	13.282	3.053	13.628	-15.123	4.461	15.767
T-SUB12-SWBD12	0.48	3.770	-17.070	17.482	3.780	-16.273	16.707	14.783	3.265	15.139	-16.670	4.507	17.269
T-TR-DP1-XLC	0.48	4.609	-5.332	7.048	3.863	-3.260	5.055	4.617	3.992	6.104	-6.210	-2.868	6.841
T-TR-DP4-XLC	0.48	4.482	-5.567	7.147	3.923	-3.532	5.279	4.822	3.881	6.190	-6.480	-2.645	6.999
T-TR-MCC 1-PNL XFMR	0.48	4.269	-3.799	5.714	3.228	-2.156	3.882	3.290	3.697	4.948	-4.557	-2.974	5.441
T-TR-MCC 1-PNL XFMR (2)	0.21	0.544	-0.606	0.814	0.554	-0.620	0.831	0.525	0.471	0.705	0.242	0.788	0.825
T-TR-MCC B1-PNL XFMR	0.48	6.915	-9.248	11.547	6.735	-6.246	9.186	8.009	5.988	10.000	-11.035	-3.779	11.664
T-TR-MCC B1-PNL XFMR2	0.21	0.911	-1.515	1.768	0.928	-1.551	1.807	1.312	0.789	1.531	0.839	1.583	1.792
T-TR-MCC B2-PNL (2)	0.21	1.014	-1.666	1.950	1.037	-1.719	2.008	1.442	0.878	1.689	0.912	1.766	1.987
T-TR-MCC B2-PNL LB1 (2)	0.21	1.033	-1.631	1.931	1.052	-1.695	1.995	1.413	0.895	1.672	0.878	1.777	1.982
T-TR-MCC D1-PNL LD 2	0.48	4.855	-4.603	6.690	3.950	-2.680	4.774	3.986	4.205	5.794	-5.590	-3.313	6.498
T-TR-MCC D1-PNL LD2 (2)	0.21	0.967	-1.521	1.802	0.989	-1.590	1.873	1.317	0.837	1.561	0.811	1.670	1.857
T-TR-MCCB2-PNL LB1	0.48	6.262	-5.580	8.387	5.331	-3.105	6.169	4.832	5.423	7.263	-7.026	-4.460	8.322
T-TR-MCCB2-PNL XFMR	0.48	6.028	-7.525	9.642	5.877	-5.009	7.722	6.517	5.220	8.350	-9.154	-3.484	9.795
T-TR-MCCB4-PNL LP2	0.48	6.143	-8.715	10.663	6.456	-6.263	8.995	7.548	5.320	9.234	-10.607	-3.055	11.038
T-TR-MCCB4-PNL LP2 (2)	0.21	0.553	-0.630	0.838	0.560	-0.636	0.848	0.545	0.479	0.726	-0.829	-0.158	0.844
T-TR-MCCD1-PNL LD	0.48	4.489	-3.536	5.714	3.435	-1.906	3.928	3.062	3.888	4.949	-4.412	-3.279	5.497
T-TR-MCCDW1-PNL LDW	0.48	5.772	-4.617	7.392	4.721	-2.457	5.322	3.998	4.999	6.401	-5.904	-4.254	7.277
T-TR-MCCHW1-PNL LHW	0.48	5.817	-8.510	10.309	6.048	-6.069	8.568	7.370	5.038	8.927	-10.210	-2.838	10.597

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1/2 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
T-TR-SUB1/2-PNL L1 XFMR	0.48	4.810	-9.767	10.887	5.390	-7.898	9.562	8.458	4.166	9.428	-11.191	-0.971	11.234
T-TR-SUB1/2-PNL L1 XFMR 2	0.21	2.025	-3.520	4.061	2.153	-3.712	4.291	3.049	1.753	3.517	-4.198	0.210	4.203
T-TR-SUB2-PNL CP XFMR	0.48	2.030	-0.570	2.108	1.244	-0.249	1.268	0.494	1.758	1.826	-0.940	-1.684	1.929
T-TR-SUB2-PNL CP XFMR 2	0.21	0.867	-0.985	1.312	0.878	-1.111	1.417	0.853	0.750	1.136	0.415	1.381	1.442
T-TR-T7A-PRI	4.16	3.704	-8.033	8.846	3.267	-4.630	5.666	6.957	3.208	7.661	-8.283	-1.631	8.442
T-TR-T7A-SEC	0.48	3.148	-12.848	13.228	3.052	-13.020	13.373	11.127	2.726	11.456	9.651	9.323	13.419
T-TR-T8A-PRI	4.16	3.713	-8.062	8.876	3.272	-4.636	5.675	6.982	3.216	7.687	-8.309	-1.638	8.469
T-TR-T8A-SEC	0.48	3.138	-12.824	13.202	3.046	-13.003	13.355	11.106	2.718	11.433	9.631	9.310	13.396
THICK WAS 3 AFD	0.48	4.527	-13.037	13.800	5.042	-11.554	12.606	11.290	3.920	11.952	-13.937	1.211	13.990
THICK WAS 4 AFD	0.48	4.527	-13.037	13.800	5.042	-11.554	12.606	11.290	3.920	11.952	-13.937	1.211	13.990
VALVE OPERATOR	0.48	4.746	-1.939	5.126	3.114	-0.829	3.222	1.679	4.110	4.440	-2.824	-3.875	4.795
WATER HEATER	0.48	5.922	-8.390	10.270	6.137	-6.087	8.644	7.266	5.129	8.894	-10.166	-2.892	10.570

All fault currents are symmetrical momentary (1/2 Cycle network) values in rms kA

\* LLG fault current is the larger of the two faulted line currents



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**Short-Circuit Summary Report**

Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
54" METER VAULT VALVE	0.480	0.29334	0.03611	0.29555	0.29334	0.03611	0.29555	0.91560	0.06113	0.91764
A/C ROOF UNIT #2	0.480	0.04453	0.02676	0.05195	0.04453	0.02676	0.05195	0.13143	0.03594	0.13625
ABFV-1	0.480	0.05123	0.03247	0.06066	0.05123	0.03247	0.06066	0.15291	0.05504	0.16251
ABFV-2	0.480	0.06123	0.03281	0.06947	0.06123	0.03281	0.06947	0.18441	0.05588	0.19269
ABFV-3	0.480	0.07123	0.03315	0.07857	0.07123	0.03315	0.07857	0.21591	0.05671	0.22323
ABFV-4	0.480	0.08123	0.03349	0.08787	0.08123	0.03349	0.08787	0.24741	0.05755	0.25401
ABFV-5	0.480	0.09123	0.03383	0.09730	0.09123	0.03383	0.09730	0.27891	0.05838	0.28495
ABW #1 EFF. WEIR GATE	0.480	0.29334	0.03611	0.29555	0.29334	0.03611	0.29555	0.91560	0.06113	0.91764
ABW #1 FESTON SYSTEM	0.480	0.11804	0.03571	0.12332	0.11804	0.03571	0.12332	0.36341	0.06014	0.36835
ABW #1 INF. WEIR GATE	0.480	0.28134	0.03548	0.28357	0.28134	0.03548	0.28357	0.87780	0.05958	0.87982
ABW #1 SLUICE GATE #1	0.480	0.46533	0.03728	0.46682	0.46533	0.03728	0.46682	1.45695	0.06182	1.45826
ABW #3 FESTON SYSTEM	0.480	0.12293	0.03700	0.12838	0.12293	0.03700	0.12838	0.37839	0.06113	0.38329
ABW #3,4,5 FESTON SYSTEM	0.480	0.20813	0.03854	0.21167	0.20813	0.03854	0.21167	0.64677	0.06492	0.65002
ABW 3,4,5 FLOCCULATOR	0.480	0.48533	0.03796	0.48681	0.48533	0.03796	0.48681	1.51995	0.06349	1.52127
ABW #3,4,6 FESTON SYSTEM	0.480	0.20034	0.03724	0.20377	0.20034	0.03724	0.20377	0.62265	0.06391	0.62592
ABW #3,4,6 SLUICE GATE	0.480	0.31734	0.03737	0.31953	0.31734	0.03737	0.31953	0.99120	0.06423	0.99328
ABW #5 SLUICE GATE	0.480	0.29334	0.03611	0.29555	0.29334	0.03611	0.29555	0.91560	0.06113	0.91764
ABW #6 FESTON SYSTEM	0.480	0.12294	0.03635	0.12820	0.12294	0.03635	0.12820	0.37884	0.06172	0.38384
ABW #6 SLUICE GATE	0.480	0.30534	0.03674	0.30754	0.30534	0.03674	0.30754	0.95340	0.06268	0.95546
ABW 6,7 FLASH MIXER #3	0.480	0.34133	0.03928	0.34358	0.34133	0.03928	0.34358	1.06635	0.06674	1.06843
ABW #7 FESTON SYSTEM	0.480	0.13763	0.03892	0.14303	0.13763	0.03892	0.14303	0.42469	0.06585	0.42977
ABW FILTER #2	0.480	0.12783	0.03764	0.13325	0.12783	0.03764	0.13325	0.39382	0.06270	0.39878
ABW SLUICE GATE	0.480	0.48533	0.03796	0.48681	0.48533	0.03796	0.48681	1.51995	0.06349	1.52127
ACU-1	0.480	0.02743	0.03265	0.04265	0.02743	0.03265	0.04265	0.07794	0.05548	0.09567
AFD-MCC D1-THICKENER	0.480	0.03044	0.02756	0.04107	0.03044	0.02756	0.04107	0.08557	0.03846	0.09382
AIR COMPRESSOR	0.480	0.02217	0.01987	0.02977	0.02217	0.01987	0.02977	0.06219	0.02470	0.06692
AIR COMPRESSOR 2	0.480	0.02412	0.02003	0.03136	0.02412	0.02003	0.03136	0.06833	0.02510	0.07280
BASIN 1 ADFV 13	0.480	0.09522	0.02516	0.09849	0.09522	0.02516	0.09849	0.28918	0.03150	0.29089
BASIN 2 ADFV 14	0.480	0.11922	0.02642	0.12211	0.11922	0.02642	0.12211	0.36478	0.03460	0.36642
BASIN 3 ADFV 15	0.480	0.15222	0.02815	0.15480	0.15222	0.02815	0.15480	0.46873	0.03886	0.47034
BASIN 4 ADFV 16	0.480	0.18522	0.02988	0.18762	0.18522	0.02988	0.18762	0.57268	0.04312	0.57430
BELT FILTER PRESS 1	0.480	0.03736	0.02492	0.04491	0.03736	0.02492	0.04491	0.10662	0.03072	0.11096
BELT FILTER PRESS 2	0.480	0.03748	0.02562	0.04540	0.03748	0.02562	0.04540	0.10662	0.03072	0.11096
BELT FILTER PRESS 3	0.480	0.03022	0.02466	0.03900	0.03022	0.02466	0.03900	0.08347	0.02836	0.08815
BELT FILTER PRESS 4	0.480	0.03011	0.02396	0.03848	0.03011	0.02396	0.03848	0.08347	0.02836	0.08815

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Bus ID	kV	Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
		Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
BELT FILTER PRESS 5	0.480	0.02280	0.02298	0.03238	0.02280	0.02298	0.03238	0.06032	0.02600	0.06568
BELT FILTER PRESS 6	0.480	0.02281	0.02299	0.03239	0.02281	0.02299	0.03239	0.06032	0.02600	0.06568
BLOWER #6 INLET VALVE	0.480	0.02160	0.03147	0.03816	0.02160	0.03147	0.03816	0.05956	0.05256	0.07943
BLOWER A LS	4.160	0.09056	0.23054	0.24769	0.09056	0.23054	0.24769	0.45869	0.50147	0.67961
BLOWER B LS	4.160	0.08794	0.22831	0.24466	0.08794	0.22831	0.24466	0.46594	0.50881	0.68992
BLOWER BUS A	4.160	0.09056	0.23054	0.24769	0.09056	0.23054	0.24769	0.45869	0.50147	0.67961
BLOWER BUS B	4.160	0.08794	0.22831	0.24466	0.08794	0.22831	0.24466	0.46594	0.50881	0.68992
CLARIFIER 1 CP	0.480	0.18147	0.03769	0.18534	0.18147	0.03769	0.18534	0.56482	0.06610	0.56867
CLARIFIER 2 CP	0.480	0.18031	0.03839	0.18436	0.18031	0.03839	0.18436	0.55983	0.06511	0.56360
CLARIFIER 5 CP	0.480	0.18172	0.03794	0.18563	0.18172	0.03794	0.18563	0.56567	0.06674	0.56959
CONVEYOR CP	0.480	0.05255	0.02535	0.05835	0.05255	0.02535	0.05835	0.15371	0.03008	0.15663
D-DP1-RAS PUMP 7	0.480	0.02870	0.03220	0.04313	0.02870	0.03220	0.04313	0.08529	0.05242	0.10011
D-DP1-RAS PUMP 8	0.480	0.02870	0.03220	0.04313	0.02870	0.03220	0.04313	0.08529	0.05242	0.10011
D-DP1-WAS 5	0.480	0.03358	0.02981	0.04491	0.03358	0.02981	0.04491	0.09947	0.04671	0.10989
D-DP1-WAS 6	0.480	0.03358	0.02981	0.04491	0.03358	0.02981	0.04491	0.09947	0.04671	0.10989
D-DP2-RAS PUMP 1	0.480	0.03739	0.03388	0.05045	0.03739	0.03388	0.05045	0.11374	0.05621	0.12687
D-DP2-RAS PUMP 3	0.480	0.03739	0.03388	0.05045	0.03739	0.03388	0.05045	0.11374	0.05621	0.12687
D-DP2-WAS 1	0.480	0.03334	0.02956	0.04456	0.03334	0.02956	0.04456	0.09862	0.04607	0.10885
D-DP2-WAS 2	0.480	0.03334	0.02956	0.04456	0.03334	0.02956	0.04456	0.09862	0.04607	0.10885
D-DP4-RAS PUMP 2	0.480	0.02431	0.03201	0.04020	0.02431	0.03201	0.04020	0.06969	0.04932	0.08537
D-DP4-WAS 2	0.480	0.03218	0.03026	0.04418	0.03218	0.03026	0.04418	0.09363	0.04509	0.10392
D-DP4-WAS PUMP 2	0.480	0.09155	0.03269	0.09721	0.09155	0.03269	0.09721	0.28263	0.05011	0.28703
D-MCC 1-EXHAUST 1	0.480	0.09110	0.03385	0.09718	0.09110	0.03385	0.09718	0.27891	0.05838	0.28495
D-MCC 1-EXHAUST 2	0.480	0.09110	0.03385	0.09718	0.09110	0.03385	0.09718	0.27891	0.05838	0.28495
D-MCC 1-EXHAUST 3	0.480	0.09110	0.03385	0.09718	0.09110	0.03385	0.09718	0.27891	0.05838	0.28495
D-MCC 1-EXHAUST 4	0.480	0.09110	0.03385	0.09718	0.09110	0.03385	0.09718	0.27891	0.05838	0.28495
D-MCC B1-AIR BLOWER	0.480	0.01199	0.02067	0.02390	0.01199	0.02067	0.02390	0.03211	0.02671	0.04177
D-MCC B1-DAF THICK 2	0.480	0.08950	0.02133	0.09200	0.08950	0.02133	0.09200	0.27466	0.02821	0.27610
D-MCC B1-EAST DAF RECYC	0.480	0.01290	0.02096	0.02462	0.01290	0.02096	0.02462	0.03526	0.02741	0.04466
D-MCC B1-PRESSURIZATION	0.480	0.01949	0.02306	0.03019	0.01949	0.02306	0.03019	0.05731	0.03232	0.06579
D-MCC B1-THICK WAS 3	0.480	0.01832	0.02239	0.02893	0.01832	0.02239	0.02893	0.05101	0.03092	0.05965
D-MCC B1-THICK WAS 4	0.480	0.01832	0.02239	0.02893	0.01832	0.02239	0.02893	0.05101	0.03092	0.05965
D-MCC B1-WEST DAF RECYC	0.480	0.01290	0.02096	0.02462	0.01290	0.02096	0.02462	0.03526	0.02741	0.04466
D-MCC B2-AIR COMPRESSOR	0.480	0.03411	0.02432	0.04190	0.03411	0.02432	0.04190	0.09829	0.02932	0.10257
D-MCC B2-EQ DIVERSION VLV	0.480	0.09503	0.02345	0.09788	0.09503	0.02345	0.09788	0.28918	0.02740	0.29047
D-MCC B2-RETURN SLUDGE	0.480	0.05820	0.02599	0.06374	0.05820	0.02599	0.06374	0.17767	0.03107	0.18036

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Bus	ID	kV	Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
			Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
D-MCC B2-RETURN SLUDGE 2		0.480	0.04316	0.02414	0.04946	0.04316	0.02414	0.04946	0.12853	0.02787	0.13152
D-MCC B2-RETURN SLUDGE 3		0.480	0.05069	0.02504	0.05654	0.05069	0.02504	0.05654	0.15310	0.02947	0.15591
D-MCC B2-RETURN SLUDGE 4		0.480	0.05069	0.02504	0.05654	0.05069	0.02504	0.05654	0.15310	0.02947	0.15591
D-MCC B2-RETURN SLUDGE 5		0.480	0.05820	0.02599	0.06374	0.05820	0.02599	0.06374	0.17767	0.03107	0.18036
D-MCC B3-STANDBY PRESSURE		0.480	0.01622	0.02236	0.02762	0.01622	0.02236	0.02762	0.04532	0.03013	0.05442
D-MCC D1-BFP FEED PUMP		0.480	0.06966	0.03053	0.07605	0.06966	0.03053	0.07605	0.21157	0.04453	0.21621
D-MCC D1-BFP FEED PUMP5		0.480	0.06434	0.03181	0.07177	0.06434	0.03181	0.07177	0.19456	0.04798	0.20039
D-MCC D1-GRAVITY THICK		0.480	0.15022	0.03173	0.15354	0.15022	0.03173	0.15354	0.46357	0.04850	0.46610
D-MCC D1-SLUDGE RECIRC 1		0.480	0.03475	0.03012	0.04599	0.03475	0.03012	0.04599	0.09975	0.04466	0.10929
D-MCC D1-SLUDGE RECIRC 3		0.480	0.03957	0.03079	0.05014	0.03957	0.03079	0.05014	0.11518	0.04623	0.12411
D-MCC D1-SLUDGE RECIRC 4		0.480	0.04439	0.03147	0.05441	0.04439	0.03147	0.05441	0.13062	0.04781	0.13909
D-MCC D1-SLUDGE TRANSFER1		0.480	0.02980	0.02950	0.04193	0.02980	0.02950	0.04193	0.08431	0.04308	0.09468
D-MCC D1-THICKENER		0.480	0.14888	0.03293	0.15248	0.14888	0.03293	0.15248	0.46357	0.04850	0.46610
D-MCC D2-BFP FEED PUMP1		0.480	0.05221	0.03018	0.06031	0.05221	0.03018	0.06031	0.15518	0.04252	0.16090
D-MCC D2-BFP FEED PUMP4		0.480	0.07575	0.03181	0.08216	0.07575	0.03181	0.08216	0.23078	0.04562	0.23524
D-MCC D2-BFP FEED PUMP6		0.480	0.08748	0.03269	0.09339	0.08748	0.03269	0.09339	0.26858	0.04717	0.27269
D-MCC D2-SLUDGE RECIRC 2		0.480	0.05308	0.03154	0.06174	0.05308	0.03154	0.06174	0.15801	0.04589	0.16454
D-MCC D2-SLUDGE TRANSFER2		0.480	0.13867	0.03873	0.14397	0.13867	0.03873	0.14397	0.43868	0.05414	0.44201
D-MCC D2-SLUDGE TRANSFER3		0.480	0.06036	0.03253	0.06856	0.06036	0.03253	0.06856	0.18258	0.04749	0.18866
D-MCC D2-SLUDGE TRANSFER4		0.480	0.02971	0.02858	0.04122	0.02971	0.02858	0.04122	0.08400	0.04078	0.09337
D-MCC DW1-PLANT DRAIN1		0.480	0.11971	0.03505	0.12474	0.11971	0.03505	0.12474	0.37799	0.04580	0.38076
D-MCC DW1-PLANT DRAIN2		0.480	0.11971	0.03505	0.12474	0.11971	0.03505	0.12474	0.37799	0.04580	0.38076
D-MCC DW1-PLANT DRAIN3		0.480	0.11971	0.03505	0.12474	0.11971	0.03505	0.12474	0.37799	0.04580	0.38076
D-MCC E1-EF-7		0.480	0.10117	0.02606	0.10448	0.10117	0.02606	0.10448	0.31080	0.03633	0.31292
D-MCC E1-FLASH MIXER 1		0.480	0.51651	0.08047	0.52274	0.51651	0.08047	0.52274	1.70940	0.06910	1.71080
D-MCC E1-FLASH MIXER 2		0.480	0.30654	0.05113	0.31078	0.30654	0.05113	0.31078	0.99120	0.06423	0.99328
D-MCC E2-EF-5.1		0.480	0.16493	0.02723	0.16716	0.16493	0.02723	0.16716	0.51195	0.03672	0.51326
D-MCC E2-EF-5.2		0.480	0.16493	0.02723	0.16716	0.16493	0.02723	0.16716	0.51195	0.03672	0.51326
D-MCC HW1-CONVEYOR EAST		0.480	0.06461	0.02367	0.06881	0.06461	0.02367	0.06881	0.19466	0.02814	0.19669
D-MCC HW1-FINAL CLAR. 3		0.480	1.02989	0.05347	1.03127	1.02989	0.05347	1.03127	3.27694	0.08055	3.27793
D-MCC HW1-FINAL CLAR. 4		0.480	1.01478	0.05285	1.01615	1.01478	0.05285	1.01615	3.22811	0.07965	3.22909
D-MCC HW1-GRIT CLASS WEST		0.480	0.22415	0.02823	0.22592	0.22415	0.02823	0.22592	0.69866	0.03879	0.69974
D-MCC HW1-PRI. SLUDGE		0.480	0.71817	0.04886	0.71983	0.71817	0.04886	0.71983	2.27366	0.08061	2.27509

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
D-MCC HW1-RSP 4	0.480	0.05464	0.03595	0.06540	0.05464	0.03595	0.06540	0.16946	0.05685	0.17874
D-MCC HW1-RSP 5	0.480	0.05464	0.03595	0.06540	0.05464	0.03595	0.06540	0.16946	0.05685	0.17874
D-MCC HW1-WEST CONVEYOR	0.480	0.23261	0.03011	0.23455	0.23261	0.03011	0.23455	0.73016	0.03963	0.73124
D-MCC HW2-GRIT CLASS 2	0.480	0.14484	0.02593	0.14714	0.14484	0.02593	0.14714	0.44758	0.03328	0.44881
D-MCC HW2-GRIT PUMP 2	0.480	0.07573	0.02597	0.08006	0.07573	0.02597	0.08006	0.23338	0.03087	0.23541
D-MCC HW2-PRI. SLUDGE 1	0.480	0.52158	0.04075	0.52317	0.52158	0.04075	0.52317	1.64458	0.06506	1.64586
D-MCC HW2-PRI. SLUDGE 3	0.480	0.52158	0.04075	0.52317	0.52158	0.04075	0.52317	1.64458	0.06506	1.64586
D-MCC HW2-RSP 6	0.480	0.05489	0.03657	0.06596	0.05489	0.03657	0.06596	0.17038	0.05803	0.17999
D-MCC HW2-WAS PUMP 3	0.480	0.32240	0.04500	0.32553	0.32240	0.04500	0.32553	1.02718	0.06342	1.02913
D-MCC HW2-WAS PUMP 4	0.480	0.32240	0.04500	0.32553	0.32240	0.04500	0.32553	1.02718	0.06342	1.02913
D-MCCB4-SUBM PUMP START	0.480	0.12010	0.03199	0.12429	0.12010	0.03199	0.12429	0.37423	0.04386	0.37679
DAF THICKENER 2 AFD	0.480	0.02960	0.01925	0.03531	0.02960	0.01925	0.03531	0.08566	0.02319	0.08874
DAVIS SCRUBBER	0.480	0.02115	0.02563	0.03323	0.02115	0.02563	0.03323	0.05698	0.03279	0.06574
DEEP WELL PUMP 1 VFD	0.480	0.00383	0.01787	0.01827	0.00383	0.01787	0.01827	0.00561	0.01957	0.02036
DEEP WELL PUMP 2 VFD	0.480	0.00382	0.01671	0.01715	0.00382	0.01671	0.01715	0.00746	0.02142	0.02268
DEEP WELL PUMP 3 VFD	0.480	0.00324	0.01592	0.01624	0.00324	0.01592	0.01624	0.00500	0.01896	0.01961
DEEP WELL PUMP 4 VFD	0.480	0.00511	0.01914	0.01981	0.00511	0.01914	0.01981	0.00961	0.02377	0.02564
DEEP WELL PUMP 5 VFD	0.480	0.00454	0.01735	0.01794	0.00454	0.01735	0.01794	0.01031	0.02440	0.02649
DEEP WELL PUMP 6 VFD	0.480	0.00433	0.01706	0.01760	0.00433	0.01706	0.01760	0.00938	0.02348	0.02528
DEGRITTER CP	0.480	0.08889	0.02552	0.09248	0.08889	0.02552	0.09248	0.27118	0.03242	0.27311
DP1 MAIN LS	0.480	0.01372	0.02912	0.03218	0.01372	0.02912	0.03218	0.03647	0.04504	0.05795
DP2 MAIN LS	0.480	0.01347	0.02887	0.03186	0.01347	0.02887	0.03186	0.03562	0.04440	0.05692
DP4 MAIN LS	0.480	0.01231	0.02957	0.03204	0.01231	0.02957	0.03204	0.03063	0.04342	0.05313
EFF. FILTER PS CNTRL	0.480	0.01478	0.02929	0.03281	0.01478	0.02929	0.03281	0.03771	0.04216	0.05657
ELECTRIC ROLL-UP DOOR	0.480	0.07123	0.03315	0.07857	0.07123	0.03315	0.07857	0.21591	0.05671	0.22323
EQ TANK RETURN	0.480	0.10522	0.02383	0.10789	0.10522	0.02383	0.10789	0.32068	0.02824	0.32192
FPL PRIMARY	23.000	1.20097	9.69842	9.77250	1.20097	9.69842	9.77250			
FPL SERVICE	4.160	0.01193	0.12306	0.12364	0.01193	0.12306	0.12364	0.00391	0.04097	0.04116
HOIST	0.480	0.03217	0.02178	0.03885	0.03217	0.02178	0.03885	0.09073	0.02336	0.09369
LIGHTING PANEL	0.208	0.04671	0.05919	0.07541	0.04671	0.05919	0.07541	0.06917	0.05701	0.08963
LTG. PNL	0.208	0.03402	0.05319	0.06313	0.03402	0.05319	0.06313	0.03494	0.04981	0.06084
MAIN GATE CP	0.480	0.36485	0.03934	0.36697	0.36485	0.03934	0.36697	1.13966	0.06688	1.14162
MCC 1	0.480	0.02123	0.03145	0.03795	0.02123	0.03145	0.03795	0.05841	0.05253	0.07856
MCC B1	0.480	0.00462	0.01841	0.01898	0.00462	0.01841	0.01898	0.00691	0.02110	0.02221
MCC B2	0.480	0.00517	0.02036	0.02100	0.00517	0.02036	0.02100	0.00568	0.01987	0.02067
MCC B3	0.480	0.00504	0.01892	0.01958	0.00504	0.01892	0.01958	0.00752	0.02172	0.02298

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
MCC B4	0.480	0.00522	0.02043	0.02109	0.00522	0.02043	0.02109	0.00568	0.01987	0.02067
MCC D1	0.480	0.01056	0.02687	0.02888	0.01056	0.02687	0.02888	0.02257	0.03679	0.04316
MCC D2	0.480	0.01080	0.02773	0.02976	0.01080	0.02773	0.02976	0.02288	0.03709	0.04358
MCC D4 LS	0.480	0.00584	0.02148	0.02226	0.00584	0.02148	0.02226	0.00790	0.02352	0.02481
MCC D5 LS	0.480	0.00585	0.02153	0.02231	0.00585	0.02153	0.02231	0.00790	0.02352	0.02481
MCC DW1	0.480	0.00576	0.02077	0.02155	0.00576	0.02077	0.02155	0.00629	0.02049	0.02143
MCC DW2	0.480	0.00588	0.02147	0.02226	0.00588	0.02147	0.02226	0.00629	0.02049	0.02143
MCC E1	0.480	0.00534	0.02099	0.02166	0.00534	0.02099	0.02166	0.00840	0.02393	0.02536
MCC E2	0.480	0.00533	0.02164	0.02229	0.00533	0.02164	0.02229	0.00795	0.02334	0.02466
MCC HW 1	0.480	0.00485	0.02044	0.02101	0.00485	0.02044	0.02101	0.00566	0.02039	0.02116
MCC HW 2	0.480	0.00515	0.02107	0.02169	0.00515	0.02107	0.02169	0.00658	0.02157	0.02255
MCC-D4	0.480	0.00584	0.02148	0.02226	0.00584	0.02148	0.02226	0.00790	0.02352	0.02481
MCC-D5	0.480	0.00585	0.02153	0.02231	0.00585	0.02153	0.02231	0.00790	0.02352	0.02481
MCC1 LS	0.480	0.02123	0.03145	0.03795	0.02123	0.03145	0.03795	0.05841	0.05253	0.07856
MCCB1 LS	0.480	0.00462	0.01841	0.01898	0.00462	0.01841	0.01898	0.00691	0.02110	0.02221
MCCD1 LS	0.480	0.01056	0.02687	0.02888	0.01056	0.02687	0.02888	0.02257	0.03679	0.04316
MCCD2 LS	0.480	0.01080	0.02773	0.02976	0.01080	0.02773	0.02976	0.02288	0.03709	0.04358
MECH SCREEN CP	0.480	0.10412	0.02416	0.10689	0.10412	0.02416	0.10689	0.32066	0.02875	0.32195
MOV RATE OF FLOW	0.480	0.31733	0.03802	0.31960	0.31733	0.03802	0.31960	0.99075	0.06364	0.99279
MTS-AC1-LOAD	0.480	0.15387	0.02840	0.15647	0.15387	0.02840	0.15647	0.48040	0.03607	0.48176
MTS-MCC D4 LINE	0.480	0.15387	0.02840	0.15647	0.15387	0.02840	0.15647	0.48040	0.03607	0.48176
MTS-MCC D5-LINE	0.480	0.15585	0.02663	0.15811	0.15585	0.02663	0.15811	0.48040	0.03607	0.48176
NEW MAINT. BLDG	0.480	0.01852	0.03284	0.03770	0.01852	0.03284	0.03770	0.04636	0.05001	0.06819
OLD MAINTENANCE BLDG	0.480	0.04788	0.03344	0.05840	0.04788	0.03344	0.05840	0.13859	0.04993	0.14731
PLANT DRAIN #3	0.480	0.00672	0.02128	0.02232	0.00672	0.02128	0.02232	0.00944	0.02182	0.02377
PLANT DRAIN PS CTL PNL	0.480	0.01793	0.03184	0.03654	0.01793	0.03184	0.03654	0.04764	0.04843	0.06793
PMS-7A LS	4.160	0.10444	0.24128	0.26291	0.10444	0.24128	0.26291	0.49043	0.53206	0.72361
PMS-8A LS	4.160	0.10392	0.24048	0.26198	0.10392	0.24048	0.26198	0.49043	0.53206	0.72361
PNL CP	0.208	0.06448	0.06987	0.09508	0.06448	0.06987	0.09508	0.04932	0.06486	0.08148
PNL DP #1	0.480	0.01372	0.02912	0.03218	0.01372	0.02912	0.03218	0.03647	0.04504	0.05795
PNL DP #2	0.480	0.01347	0.02887	0.03186	0.01347	0.02887	0.03186	0.03562	0.04440	0.05692
PNL DP #4	0.480	0.01231	0.02957	0.03204	0.01231	0.02957	0.03204	0.03063	0.04342	0.05313
PNL L1	0.208	0.02824	0.03864	0.04786	0.02824	0.03864	0.04786	0.05516	0.05333	0.07672
PNL LB1	0.208	0.03527	0.05310	0.06375	0.03527	0.05310	0.06375	0.03494	0.04981	0.06084
PNL LC1/LC2	0.208	0.03892	0.05383	0.06642	0.03892	0.05383	0.06642	0.05038	0.05138	0.07196
PNL LD	0.208	0.04047	0.06053	0.07281	0.04047	0.06053	0.07281	0.03546	0.05531	0.06570
PNL LD 2	0.208	0.03776	0.05681	0.06821	0.03776	0.05681	0.06821	0.03641	0.05229	0.06372

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
PNL LDW	0.208	0.03734	0.05681	0.06798	0.03734	0.05681	0.06798	0.03399	0.05283	0.06282
PNL LHW	0.208	0.03249	0.05286	0.06204	0.03249	0.05286	0.06204	0.03179	0.04911	0.05850
PNL LP1	0.208	0.10165	0.11033	0.15002	0.10165	0.11033	0.15002	0.10151	0.10515	0.14616
PNL LP2	0.208	0.09946	0.10831	0.14705	0.09946	0.10831	0.14705	0.10718	0.10525	0.15022
PNL P3	0.480	0.01017	0.02178	0.02404	0.01017	0.02178	0.02404	0.02143	0.02338	0.03171
PNL PC/TC-2	0.208	0.03494	0.05318	0.06363	0.03494	0.05318	0.06363	0.03951	0.04989	0.06364
PNL PC/TC-3	0.208	0.04017	0.05374	0.06710	0.04017	0.05374	0.06710	0.05038	0.05138	0.07196
PNL PC/TC-4	0.208	0.04224	0.05745	0.07131	0.04224	0.05745	0.07131	0.04943	0.05440	0.07351
PNL XLC	0.208	0.10838	0.18059	0.21061	0.10838	0.18059	0.21061	0.10355	0.17500	0.20334
PNL XLC (2)	0.208	0.10812	0.18067	0.21055	0.10812	0.18067	0.21055	0.10355	0.17500	0.20334
PNL-P1	0.480	0.04005	0.03604	0.05387	0.04005	0.03604	0.05387	0.11724	0.05862	0.13107
PNL-P4	0.480	0.02433	0.02706	0.03639	0.02433	0.02706	0.03639	0.06780	0.03666	0.07707
POLYMER FEED 5, 6	0.480	0.10164	0.02654	0.10505	0.10164	0.02654	0.10505	0.30869	0.03289	0.31044
POLYMER FEED CP	0.480	0.11316	0.02725	0.11639	0.11316	0.02725	0.11639	0.34649	0.03444	0.34820
POLYMER MIX CP	0.480	0.11261	0.02685	0.11577	0.11261	0.02685	0.11577	0.34649	0.03444	0.34820
RAS 1 VFD	0.480	0.01648	0.02947	0.03376	0.01648	0.02947	0.03376	0.04538	0.04588	0.06453
RAS 2 VFD	0.480	0.01532	0.03017	0.03384	0.01532	0.03017	0.03384	0.04039	0.04489	0.06039
RAS 3 VFD	0.480	0.01648	0.02947	0.03376	0.01648	0.02947	0.03376	0.04538	0.04588	0.06453
RAS 7 VFD	0.480	0.01672	0.02972	0.03410	0.01672	0.02972	0.03410	0.04623	0.04652	0.06558
RAS 8 VFD	0.480	0.01672	0.02972	0.03410	0.01672	0.02972	0.03410	0.04623	0.04652	0.06558
REUSE LIFT STATION PUMP	0.480	0.16534	0.02643	0.16744	0.16534	0.02643	0.16744	0.51240	0.03731	0.51376
ROOF A/C #1	0.480	0.19254	0.03659	0.19598	0.19254	0.03659	0.19598	0.59808	0.06231	0.60132
S-DEEP WELL 2 LOAD	0.480	0.00324	0.01592	0.01624	0.00324	0.01592	0.01624	0.00500	0.01896	0.01961
S-DEEP WELL 5 LOAD	0.480	0.00419	0.01686	0.01737	0.00419	0.01686	0.01737	0.00877	0.02286	0.02449
S-MCC D1-PNL LD	0.480	0.03396	0.02882	0.04455	0.03396	0.02882	0.04455	0.09628	0.04158	0.10488
S-MCC D2-PNL LD	0.480	0.03420	0.02968	0.04528	0.03420	0.02968	0.04528	0.09659	0.04189	0.10528
S-MCC DW1-PNL LDW	0.480	0.02526	0.02239	0.03376	0.02526	0.02239	0.03376	0.06772	0.02449	0.07201
S-MCC DW2-PNL LDW	0.480	0.02538	0.02309	0.03431	0.02538	0.02309	0.03431	0.06772	0.02449	0.07201
S-MCC HW1-PNL LHW	0.480	0.01460	0.02125	0.02579	0.01460	0.02125	0.02579	0.03638	0.02239	0.04271
S-MCC HW2-PNL LHW	0.480	0.01127	0.02187	0.02460	0.01127	0.02187	0.02460	0.02587	0.02354	0.03498
S-MCCB2-PNL LB1	0.480	0.01687	0.02133	0.02720	0.01687	0.02133	0.02720	0.04253	0.02227	0.04801
S-MCCB2-PNL P3	0.480	0.00817	0.02121	0.02273	0.00817	0.02121	0.02273	0.01513	0.02198	0.02668
S-MCCB3-PNL LB1	0.480	0.01674	0.01989	0.02600	0.01674	0.01989	0.02600	0.04438	0.02412	0.05051
S-MCCB3-PNL P3	0.480	0.00804	0.01977	0.02135	0.00804	0.01977	0.02135	0.01697	0.02382	0.02925
S-MCCE1-PNL P4	0.480	0.02734	0.02726	0.03861	0.02734	0.02726	0.03861	0.07770	0.03936	0.08710
S-MCCE2-PNL P4	0.480	0.02133	0.02620	0.03378	0.02133	0.02620	0.03378	0.05835	0.03456	0.06781
S-PNL L1-LOAD	0.480	0.01005	0.02229	0.02445	0.01005	0.02229	0.02445	0.02274	0.02479	0.03364

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
S-PNL LB1-LOAD	0.480	0.01687	0.02133	0.02720	0.01687	0.02133	0.02720	0.04253	0.02227	0.04801
S-PNL LD LOAD	0.480	0.03420	0.02968	0.04528	0.03420	0.02968	0.04528	0.09659	0.04189	0.10528
S-PNL LDW LOAD	0.480	0.02538	0.02309	0.03431	0.02538	0.02309	0.03431	0.06772	0.02449	0.07201
S-PNL LHW LOAD	0.480	0.01127	0.02187	0.02460	0.01127	0.02187	0.02460	0.02587	0.02354	0.03498
S-PNL P1-LOAD	0.480	0.01005	0.02229	0.02445	0.01005	0.02229	0.02445	0.02274	0.02479	0.03364
S-PNL P3-LOAD	0.480	0.00817	0.02121	0.02273	0.00817	0.02121	0.02273	0.01513	0.02198	0.02668
S-PNL P4-LOAD	0.480	0.02133	0.02620	0.03378	0.02133	0.02620	0.03378	0.05835	0.03456	0.06781
S-SUB1-PNL L1	0.480	0.00761	0.02049	0.02186	0.00761	0.02049	0.02186	0.01518	0.02209	0.02680
S-SUB1-PNL P1	0.480	0.00761	0.02049	0.02186	0.00761	0.02049	0.02186	0.01518	0.02209	0.02680
S-SUB2-PNL L1	0.480	0.01005	0.02229	0.02445	0.01005	0.02229	0.02445	0.02274	0.02479	0.03364
S-SUB2-PNL P1	0.480	0.01005	0.02229	0.02445	0.01005	0.02229	0.02445	0.02274	0.02479	0.03364
S-SUB9-DEEP WELL 2	0.480	0.00418	0.01828	0.01876	0.00418	0.01828	0.01876	0.00623	0.02019	0.02113
S-SUB10-DEEP WELL 2	0.480	0.00324	0.01592	0.01624	0.00324	0.01592	0.01624	0.00500	0.01896	0.01961
S-SWBD11-DEEP WELL 5	0.480	0.00507	0.01903	0.01969	0.00507	0.01903	0.01969	0.00900	0.02316	0.02485
S-SWBD12-DEEP WELL 5	0.480	0.00419	0.01686	0.01737	0.00419	0.01686	0.01737	0.00877	0.02286	0.02449
SCUM EJECTOR CP	0.480	0.29316	0.04760	0.29700	0.29316	0.04760	0.29700	0.95066	0.05914	0.95250
SEC CLARIFIERS 3, 4	0.480	0.40115	0.04186	0.40332	0.40115	0.04186	0.40332	1.25398	0.07271	1.25608
SLUDGE THICKENER DRIVE	0.480	0.07117	0.02382	0.07505	0.07117	0.02382	0.07505	0.21358	0.02840	0.21546
SLUICE GATE 2	0.480	0.46533	0.03728	0.46682	0.46533	0.03728	0.46682	1.45695	0.06182	1.45826
SLUICE GATE #4	0.480	0.46534	0.03663	0.46678	0.46534	0.03663	0.46678	1.45740	0.06241	1.45874
SODIUM BICARBONATE CP	0.480	0.02256	0.03029	0.03777	0.02256	0.03029	0.03777	0.06037	0.04520	0.07542
SUB 1 BUS A	0.480	0.00401	0.01884	0.01926	0.00401	0.01884	0.01926	0.00384	0.01803	0.01843
SUB1 FEED	4.160	0.01836	0.13142	0.13270	0.01836	0.13142	0.13270	0.03827	0.07575	0.08487
SUB1 LS	0.480	0.00401	0.01884	0.01926	0.00401	0.01884	0.01926	0.00384	0.01803	0.01843
SUB1/SUB9	4.160	0.01238	0.12340	0.12402	0.01238	0.12340	0.12402	0.00565	0.04272	0.04310
SUB 2 BUS B	0.480	0.00405	0.01954	0.01995	0.00405	0.01954	0.01995	0.00384	0.01803	0.01843
SUB2 FEED	4.160	0.01707	0.12970	0.13082	0.01707	0.12970	0.13082	0.03102	0.06841	0.07512
SUB2 LS	0.480	0.00405	0.01954	0.01995	0.00405	0.01954	0.01995	0.00384	0.01803	0.01843
SUB2/SUB10	4.160	0.01240	0.12341	0.12404	0.01240	0.12341	0.12404	0.00565	0.04272	0.04310
SUB 3 BUS A	0.480	0.00430	0.01954	0.02001	0.00430	0.01954	0.02001	0.00384	0.01803	0.01843
SUB3 FEED	4.160	0.03718	0.15685	0.16120	0.03718	0.15685	0.16120	0.14700	0.18585	0.23696
SUB3 MAIN LS	0.480	0.00430	0.01954	0.02001	0.00430	0.01954	0.02001	0.00384	0.01803	0.01843
SUB 4 BUS B	0.480	0.00430	0.01970	0.02016	0.00430	0.01970	0.02016	0.00384	0.01803	0.01843
SUB4 FEED	4.160	0.03685	0.15652	0.16080	0.03685	0.15652	0.16080	0.15062	0.18952	0.24209
SUB4 MAIN LS	0.480	0.00430	0.01970	0.02016	0.00430	0.01970	0.02016	0.00384	0.01803	0.01843
SUB 5 BUS A	0.480	0.00464	0.01969	0.02023	0.00464	0.01969	0.02023	0.00384	0.01803	0.01843
SUB5 FEED	4.160	0.07447	0.20814	0.22106	0.07447	0.20814	0.22106	0.36446	0.40605	0.54563

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
SUB5 MAIN LS	0.480	0.00464	0.01969	0.02023	0.00464	0.01969	0.02023	0.00384	0.01803	0.01843
SUB 6 BUS B	0.480	0.00394	0.01749	0.01793	0.00394	0.01749	0.01793	0.00384	0.01803	0.01843
SUB6 FEED	4.160	0.07245	0.20640	0.21874	0.07245	0.20640	0.21874	0.37171	0.41339	0.55593
SUB6 MAIN LS	0.480	0.00394	0.01749	0.01793	0.00394	0.01749	0.01793	0.00384	0.01803	0.01843
SUB 7 BUS A	0.480	0.00510	0.02049	0.02111	0.00510	0.02049	0.02111	0.00384	0.01803	0.01843
SUB7 FEED	4.160	0.09619	0.23659	0.25540	0.09619	0.23659	0.25540	0.47681	0.51982	0.70538
SUB7 MAIN LS	0.480	0.00510	0.02049	0.02111	0.00510	0.02049	0.02111	0.00384	0.01803	0.01843
SUB7/SUB11	4.160	0.01240	0.12341	0.12404	0.01240	0.12341	0.12404	0.00565	0.04272	0.04310
SUB 8 BUS B	0.480	0.00502	0.01984	0.02047	0.00502	0.01984	0.02047	0.00384	0.01803	0.01843
SUB8 FEED	4.160	0.09567	0.23579	0.25446	0.09567	0.23579	0.25446	0.47681	0.51982	0.70538
SUB8 MAIN LS	0.480	0.00502	0.01984	0.02047	0.00502	0.01984	0.02047	0.00384	0.01803	0.01843
SUB8/SUB12	4.160	0.01238	0.12340	0.12402	0.01238	0.12340	0.12402	0.00565	0.04272	0.04310
SUB 9 BUS A	0.480	0.00340	0.01728	0.01761	0.00340	0.01728	0.01761	0.00377	0.01773	0.01812
SUB9 FEED	4.160	0.01958	0.13309	0.13453	0.01958	0.13309	0.13453	0.04551	0.08309	0.09474
SUB9 LS	0.480	0.00340	0.01728	0.01761	0.00340	0.01728	0.01761	0.00377	0.01773	0.01812
SUB 10 BUS B	0.480	0.00294	0.01552	0.01579	0.00294	0.01552	0.01579	0.00377	0.01773	0.01812
SUB10 FEED	4.160	0.01884	0.13208	0.13342	0.01884	0.13208	0.13342	0.04189	0.07942	0.08979
SUB10 LS	0.480	0.00294	0.01552	0.01579	0.00294	0.01552	0.01579	0.00377	0.01773	0.01812
SUB11 LS	0.480	0.00394	0.01716	0.01761	0.00394	0.01716	0.01761	0.00442	0.01751	0.01806
SUB12 LS	0.480	0.00342	0.01548	0.01585	0.00342	0.01548	0.01585	0.00442	0.01751	0.01806
SUBNATANT PUMP	0.480	0.02012	0.02141	0.02938	0.02012	0.02141	0.02938	0.05573	0.02848	0.06259
SUPERNANANT PS CP	0.480	0.02976	0.03567	0.04646	0.02976	0.03567	0.04646	0.08305	0.05843	0.10155
SWBD 11 BUS A	0.480	0.00477	0.01865	0.01925	0.00477	0.01865	0.01925	0.00808	0.02224	0.02366
SWBD11 LS	0.480	0.00477	0.01865	0.01925	0.00477	0.01865	0.01925	0.00808	0.02224	0.02366
SWBD 12 BUS B	0.480	0.00397	0.01656	0.01703	0.00397	0.01656	0.01703	0.00785	0.02194	0.02330
SWBD12 LS	0.480	0.00397	0.01656	0.01703	0.00397	0.01656	0.01703	0.00785	0.02194	0.02330
SWGR BUS A	4.160	0.01238	0.12340	0.12402	0.01238	0.12340	0.12402	0.00565	0.04272	0.04310
SWGR BUS B	4.160	0.01240	0.12341	0.12404	0.01240	0.12341	0.12404	0.00565	0.04272	0.04310
SWGR MAIN 1 LS	4.160	0.01240	0.12341	0.12404	0.01240	0.12341	0.12404	0.00565	0.04272	0.04310
SWGR MAIN 2 LS	4.160	0.01238	0.12340	0.12402	0.01238	0.12340	0.12402	0.00565	0.04272	0.04310
SWITCH 11	4.160	0.02025	0.13399	0.13552	0.02025	0.13399	0.13552	0.04914	0.08676	0.09971
SWITCH 12	4.160	0.01947	0.13293	0.13435	0.01947	0.13293	0.13435	0.04551	0.08309	0.09474
T-AC-1	0.480	0.23176	0.03372	0.23420	0.23176	0.03372	0.23420	0.73240	0.04276	0.73365
T-BLOWER AB1	4.160	0.14069	0.24119	0.27922	0.14069	0.24119	0.27922	0.55019	0.56392	0.78785
T-BLOWER AB2	4.160	0.13590	0.24000	0.27581	0.13590	0.24000	0.27581	0.54253	0.55891	0.77892
T-BLOWER AB3	4.160	0.13111	0.23882	0.27245	0.13111	0.23882	0.27245	0.53487	0.55390	0.77000
T-BLOWER AB4	4.160	0.12892	0.23989	0.27233	0.12892	0.23989	0.27233	0.51996	0.54155	0.75076



Project: MANATEE COUNTY ESS  
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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
T-BLOWER AB5	4.160	0.12412	0.23871	0.26905	0.12412	0.23871	0.26905	0.51230	0.53654	0.74184
T-DEEP WELL PUMP 1	0.480	0.00884	0.02563	0.02711	0.00884	0.02563	0.02711	0.03141	0.04540	0.05521
T-DEEP WELL PUMP 2	0.480	0.00903	0.02483	0.02642	0.00903	0.02483	0.02642	0.03387	0.04786	0.05863
T-DEEP WELL PUMP 3	0.480	0.00871	0.02428	0.02580	0.00871	0.02428	0.02580	0.03203	0.04602	0.05607
T-DEEP WELL PUMP 4	0.480	0.01002	0.02717	0.02895	0.01002	0.02717	0.02895	0.03664	0.05083	0.06266
T-DEEP WELL PUMP 5	0.480	0.00979	0.02579	0.02758	0.00979	0.02579	0.02758	0.03795	0.05208	0.06444
T-DEEP WELL PUMP 6	0.480	0.00974	0.02570	0.02748	0.00974	0.02570	0.02748	0.03764	0.05177	0.06401
T-DP1-WAS PUMP 5	0.480	0.19108	0.03746	0.19471	0.19108	0.03746	0.19471	0.60347	0.06009	0.60645
T-DP1-WAS PUMP 6	0.480	0.19108	0.03746	0.19471	0.19108	0.03746	0.19471	0.60347	0.06009	0.60645
T-DP2-WAS PUMP 1	0.480	0.09270	0.03200	0.09807	0.09270	0.03200	0.09807	0.28762	0.05109	0.29212
T-DP2-WAS PUMP 2	0.480	0.09270	0.03200	0.09807	0.09270	0.03200	0.09807	0.28762	0.05109	0.29212
T-GEN 1	4.160	0.06059	1.15117	1.15276	0.12260	1.10341	1.11019	0.00939	0.06576	0.06643
T-GEN 2	4.160	0.05394	1.02487	1.02629	0.11185	1.00666	1.01286	0.06383	0.44682	0.45135
T-MCC D4-BLOWER 1	0.480	0.02923	0.03569	0.04613	0.02923	0.03569	0.04613	0.09295	0.05939	0.11031
T-MCC D4-BLOWER 3	0.480	0.02552	0.03326	0.04192	0.02552	0.03326	0.04192	0.07878	0.05341	0.09518
T-MCC D4-PMP 1	0.480	0.04555	0.03795	0.05929	0.04555	0.03795	0.05929	0.14650	0.06208	0.15912
T-MCC D4-PMP 3	0.480	0.03861	0.03476	0.05195	0.03861	0.03476	0.05195	0.12130	0.05507	0.13322
T-MCC D5-BLOWER 2	0.480	0.03368	0.03874	0.05133	0.03368	0.03874	0.05133	0.11028	0.06669	0.12888
T-MCC D5-BLOWER 4	0.480	0.02552	0.03330	0.04196	0.02552	0.03330	0.04196	0.07878	0.05341	0.09518
T-MCC D5-PMP 2	0.480	0.05237	0.04126	0.06668	0.05237	0.04126	0.06668	0.17170	0.06909	0.18508
T-MCC D5-PMP 4	0.480	0.03862	0.03480	0.05199	0.03862	0.03480	0.05199	0.12130	0.05507	0.13322
T-MCCD1-PNL LD	0.208	0.03947	0.06024	0.07202	0.03947	0.06024	0.07202	0.03231	0.05461	0.06345
T-MCCD1-PNL LDW	0.208	0.03634	0.05653	0.06720	0.03634	0.05653	0.06720	0.03084	0.05213	0.06057
T-MCCHW1-PNL LHW 2	0.208	0.03149	0.05257	0.06128	0.03149	0.05257	0.06128	0.02864	0.04840	0.05624
T-SUB2-PNL CP	0.208	0.06248	0.06930	0.09331	0.06248	0.06930	0.09331	0.04302	0.06346	0.07667
T-SUB11-SWBD11	0.480	0.00394	0.01716	0.01761	0.00394	0.01716	0.01761	0.00442	0.01751	0.01806
T-SUB12-SWBD12	0.480	0.00342	0.01548	0.01585	0.00342	0.01548	0.01585	0.00442	0.01751	0.01806
T-TR-DP1-XLC	0.480	0.02572	0.02975	0.03932	0.02572	0.02975	0.03932	0.07427	0.04659	0.08767
T-TR-DP4-XLC	0.480	0.02431	0.03020	0.03877	0.02431	0.03020	0.03877	0.06843	0.04497	0.08188
T-TR-MCC 1-PNL XFMR	0.480	0.03623	0.03224	0.04850	0.03623	0.03224	0.04850	0.10566	0.05447	0.11887
T-TR-MCC 1-PNL XFMR (2)	0.208	0.09855	0.10973	0.14749	0.09855	0.10973	0.14749	0.09175	0.10368	0.13844
T-TR-MCC B1-PNL XFMR	0.480	0.01437	0.01922	0.02400	0.01437	0.01922	0.02400	0.03762	0.02310	0.04415
T-TR-MCC B1-PNL XFMR2	0.208	0.03501	0.05822	0.06794	0.03501	0.05822	0.06794	0.03231	0.05461	0.06345
T-TR-MCC B2-PNL (2)	0.208	0.03202	0.05262	0.06159	0.03202	0.05262	0.06159	0.02864	0.04840	0.05624
T-TR-MCC B2-PNL LB1 (2)	0.208	0.03327	0.05253	0.06218	0.03327	0.05253	0.06218	0.02864	0.04840	0.05624
T-TR-MCC D1-PNL LD 2	0.480	0.03006	0.02850	0.04142	0.03006	0.02850	0.04142	0.08400	0.04078	0.09337
T-TR-MCC D1-PNL LD2 (2)	0.208	0.03576	0.05624	0.06664	0.03576	0.05624	0.06664	0.03011	0.05089	0.05913

Project: MANATEE COUNTY ESS  
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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
T-TR-MCCB2-PNL LB1	0.480	0.02467	0.02198	0.03304	0.02467	0.02198	0.03304	0.06710	0.02387	0.07122
T-TR-MCCB2-PNL XFMR	0.480	0.01797	0.02243	0.02874	0.01797	0.02243	0.02874	0.04600	0.02498	0.05234
T-TR-MCCB4-PNL LP2	0.480	0.01497	0.02124	0.02599	0.01497	0.02124	0.02599	0.03639	0.02187	0.04246
T-TR-MCCB4-PNL LP2 (2)	0.208	0.09456	0.10767	0.14330	0.09456	0.10767	0.14330	0.09175	0.10368	0.13844
T-TR-MCCD1-PNL LD	0.480	0.03810	0.03001	0.04850	0.03810	0.03001	0.04850	0.10887	0.04269	0.11694
T-TR-MCCDW1-PNL LDW	0.480	0.02928	0.02342	0.03749	0.02928	0.02342	0.03749	0.08000	0.02529	0.08390
T-TR-MCCHW1-PNL LHW	0.480	0.01517	0.02219	0.02688	0.01517	0.02219	0.02688	0.03816	0.02434	0.04526
T-TR-SUB1/2-PNL L1 XFMR	0.480	0.01125	0.02284	0.02545	0.01125	0.02284	0.02545	0.02652	0.02615	0.03724
T-TR-SUB1/2-PNL L1 XFMR 2	0.208	0.01474	0.02564	0.02957	0.01474	0.02564	0.02957	0.01263	0.02135	0.02480
T-TR-SUB2-PNL CP XFMR	0.480	0.12655	0.03554	0.13144	0.12655	0.03554	0.13144	0.38971	0.05739	0.39391
T-TR-SUB2-PNL CP XFMR 2	0.208	0.06048	0.06873	0.09155	0.06048	0.06873	0.09155	0.03672	0.06206	0.07211
T-TR-T7A-PRI	4.160	0.11370	0.24656	0.27151	0.11370	0.24656	0.27151	0.50575	0.54583	0.74412
T-TR-T7A-SEC	0.480	0.00499	0.02035	0.02095	0.00499	0.02035	0.02095	0.00422	0.01983	0.02028
T-TR-T8A-PRI	4.160	0.11319	0.24576	0.27058	0.11319	0.24576	0.27058	0.50575	0.54583	0.74412
T-TR-T8A-SEC	0.480	0.00499	0.02039	0.02099	0.00499	0.02039	0.02099	0.00422	0.01983	0.02028
THICK WAS 3 AFD	0.480	0.00659	0.01897	0.02008	0.00659	0.01897	0.02008	0.01321	0.02251	0.02609
THICK WAS 4 AFD	0.480	0.00659	0.01897	0.02008	0.00659	0.01897	0.02008	0.01321	0.02251	0.02609
VALVE OPERATOR	0.480	0.05004	0.02045	0.05406	0.05004	0.02045	0.05406	0.14927	0.02548	0.15143
WATER HEATER	0.480	0.01556	0.02205	0.02698	0.01556	0.02205	0.02698	0.03716	0.02364	0.04404

**APPENDIX B4 – SHORT CIRCUIT STUDY  
(1 1/2-4 CYCLE SHORT-CIRCUIT SUMMARY REPORT)**

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
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**Short-Circuit Summary Report**

1.5-4 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
54" METER VAULT VALVE	0.48	0.929	-0.119	0.937	0.549	-0.050	0.551	0.102	0.805	0.811	-0.297	-0.790	0.844
A/C ROOF UNIT #2	0.48	4.532	-2.765	5.309	3.229	-1.320	3.489	2.391	3.929	4.599	-3.616	-3.532	5.055
ABFV-1	0.48	3.693	-2.475	4.446	2.637	-1.261	2.923	2.118	3.248	3.878	-3.112	-2.829	4.206
ABFV-2	0.48	3.394	-1.925	3.902	2.321	-0.936	2.503	1.642	2.974	3.397	-2.505	-2.668	3.659
ABFV-3	0.48	3.106	-1.531	3.463	2.060	-0.720	2.183	1.303	2.715	3.012	-2.062	-2.482	3.226
ABFV-4	0.48	2.846	-1.243	3.105	1.846	-0.571	1.932	1.057	2.483	2.698	-1.731	-2.299	2.878
ABFV-5	0.48	2.616	-1.028	2.810	1.668	-0.464	1.731	0.873	2.279	2.440	-1.479	-2.131	2.594
ABW #1 EFF. WEIR GATE	0.48	0.929	-0.119	0.937	0.549	-0.050	0.551	0.102	0.805	0.811	-0.297	-0.790	0.844
ABW #1 FESTON SYSTEM	0.48	2.134	-0.669	2.237	1.320	-0.295	1.352	0.578	1.849	1.937	-1.054	-1.760	2.051
ABW #1 INF. WEIR GATE	0.48	0.968	-0.127	0.976	0.572	-0.053	0.575	0.109	0.838	0.845	-0.312	-0.823	0.880
ABW #1 SLUICE GATE #1	0.48	0.592	-0.048	0.594	0.347	-0.020	0.348	0.041	0.512	0.514	-0.164	-0.506	0.532
ABW #3 FESTON SYSTEM	0.48	2.063	-0.628	2.156	1.271	-0.277	1.301	0.543	1.787	1.867	-1.000	-1.703	1.975
ABW #3,4,5 FESTON SYSTEM	0.48	1.286	-0.241	1.309	0.768	-0.103	0.775	0.208	1.114	1.133	-0.482	-1.083	1.185
ABW 3,4,5 FLOCCULATOR	0.48	0.567	-0.045	0.569	0.333	-0.019	0.333	0.039	0.491	0.493	-0.156	-0.486	0.510
ABW #3,4,6 FESTON SYSTEM	0.48	1.333	-0.256	1.357	0.797	-0.110	0.805	0.222	1.154	1.175	-0.506	-1.121	1.230
ABW #3,4,6 SLUICE GATE	0.48	0.860	-0.105	0.866	0.507	-0.044	0.509	0.091	0.745	0.750	-0.270	-0.732	0.780
ABW #5 SLUICE GATE	0.48	0.929	-0.119	0.937	0.549	-0.050	0.551	0.102	0.805	0.811	-0.297	-0.790	0.844
ABW #6 FESTON SYSTEM	0.48	2.058	-0.630	2.152	1.269	-0.278	1.299	0.545	1.782	1.864	-1.001	-1.699	1.972
ABW #6 SLUICE GATE	0.48	0.893	-0.111	0.900	0.527	-0.047	0.529	0.096	0.774	0.779	-0.283	-0.760	0.811
ABW 6,7 FLASH MIXER #3	0.48	0.801	-0.093	0.806	0.472	-0.039	0.474	0.081	0.694	0.698	-0.248	-0.682	0.726
ABW #7 FESTON SYSTEM	0.48	1.861	-0.532	1.936	1.139	-0.235	1.163	0.460	1.612	1.676	-0.869	-1.541	1.769
ABW FILTER #2	0.48	1.991	-0.593	2.077	1.224	-0.261	1.252	0.513	1.724	1.799	-0.953	-1.646	1.902
ABW SLUICE GATE	0.48	0.567	-0.045	0.569	0.333	-0.019	0.333	0.039	0.491	0.493	-0.156	-0.486	0.510
ACU-1	0.48	3.878	-4.834	6.197	3.356	-3.091	4.563	4.201	3.466	5.447	-5.561	-2.344	6.035
AFD-MCC D1-THICKENER	0.48	4.666	-4.453	6.450	3.916	-2.588	4.694	3.854	4.050	5.591	-5.462	-3.199	6.330
AIR COMPRESSOR	0.48	6.229	-6.058	8.689	5.551	-3.455	6.538	5.230	5.633	7.686	-7.467	-4.459	8.697
AIR COMPRESSOR 2	0.48	6.154	-5.555	8.290	5.292	-3.046	6.107	4.780	5.544	7.320	-6.884	-4.523	8.237
BASIN 1 ADFV 13	0.48	2.696	-0.748	2.798	1.680	-0.295	1.706	0.646	2.336	2.423	-1.252	-2.255	2.579
BASIN 2 ADFV 14	0.48	2.202	-0.511	2.260	1.347	-0.201	1.362	0.441	1.907	1.957	-0.925	-1.852	2.070
BASIN 3 ADFV 15	0.48	1.752	-0.339	1.785	1.058	-0.133	1.066	0.293	1.518	1.546	-0.670	-1.481	1.625
BASIN 4 ADFV 16	0.48	1.453	-0.244	1.474	0.870	-0.097	0.876	0.211	1.259	1.276	-0.521	-1.231	1.337

Project: MANATEE COUNTY ESS  
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1.5-4 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
BELT FILTER PRESS 1	0.48	4.914	-3.451	6.005	3.769	-1.730	4.148	2.985	4.263	5.204	-4.459	-3.744	5.823
BELT FILTER PRESS 2	0.48	4.914	-3.451	6.005	3.769	-1.730	4.148	2.985	4.263	5.204	-4.460	-3.744	5.823
BELT FILTER PRESS 3	0.48	5.339	-4.488	6.975	4.424	-2.432	5.048	3.883	4.634	6.046	-5.676	-3.883	6.877
BELT FILTER PRESS 4	0.48	5.340	-4.488	6.975	4.424	-2.432	5.048	3.883	4.635	6.046	-5.676	-3.883	6.877
BELT FILTER PRESS 5	0.48	5.620	-5.995	8.218	5.216	-3.677	6.382	5.190	4.882	7.126	-7.440	-3.677	8.299
BELT FILTER PRESS 6	0.48	5.620	-5.995	8.218	5.216	-3.677	6.382	5.190	4.882	7.126	-7.440	-3.677	8.299
BLOWER #6 INLET VALVE	0.48	3.776	-5.743	6.873	3.489	-3.966	5.282	5.017	3.397	6.059	-6.473	-1.905	6.748
BLOWER A LS	4.16	3.249	-8.535	9.133	3.370	-5.125	6.133	7.526	2.929	8.076	-8.887	-1.186	8.966
BLOWER B LS	4.16	3.239	-8.564	9.156	3.362	-5.098	6.107	7.605	2.934	8.151	-8.937	-1.221	9.020
BLOWER BUS A	4.16	3.249	-8.535	9.133	3.370	-5.125	6.133	7.526	2.929	8.076	-8.887	-1.186	8.966
BLOWER BUS B	4.16	3.239	-8.564	9.156	3.362	-5.098	6.107	7.605	2.934	8.151	-8.937	-1.221	9.020
CLARIFIER 1 CP	0.48	1.453	-0.315	1.487	0.873	-0.136	0.884	0.272	1.258	1.288	-0.584	-1.218	1.350
CLARIFIER 2 CP	0.48	1.466	-0.317	1.500	0.881	-0.137	0.892	0.274	1.270	1.299	-0.589	-1.229	1.363
CLARIFIER 5 CP	0.48	1.450	-0.316	1.484	0.872	-0.137	0.883	0.273	1.256	1.285	-0.584	-1.215	1.348
CONVEYOR CP	0.48	4.212	-2.098	4.705	2.913	-0.927	3.057	1.814	3.651	4.077	-2.905	-3.388	4.463
D-DP1-RAS PUMP 7	0.48	4.055	-4.593	6.127	3.400	-2.812	4.412	3.977	3.519	5.310	-5.377	-2.547	5.950
D-DP1-RAS PUMP 8	0.48	4.055	-4.593	6.127	3.400	-2.812	4.412	3.977	3.519	5.310	-5.377	-2.547	5.950
D-DP1-WAS 5	0.48	4.370	-4.009	5.931	3.465	-2.259	4.136	3.469	3.791	5.139	-4.853	-3.048	5.730
D-DP1-WAS 6	0.48	4.370	-4.009	5.931	3.465	-2.259	4.136	3.469	3.791	5.139	-4.853	-3.048	5.730
D-DP2-RAS PUMP 1	0.48	3.891	-3.541	5.261	3.014	-1.997	3.616	3.064	3.376	4.559	-4.256	-2.712	5.047
D-DP2-RAS PUMP 3	0.48	3.891	-3.541	5.261	3.014	-1.997	3.616	3.064	3.376	4.559	-4.256	-2.712	5.047
D-DP2-WAS 1	0.48	4.406	-4.041	5.979	3.499	-2.276	4.174	3.497	3.823	5.181	-4.894	-3.074	5.780
D-DP2-WAS 2	0.48	4.406	-4.041	5.979	3.499	-2.276	4.174	3.497	3.823	5.181	-4.894	-3.074	5.780
D-DP4-RAS PUMP 2	0.48	4.099	-5.358	6.746	3.628	-3.471	5.021	4.640	3.558	5.848	-6.183	-2.323	6.604
D-DP4-WAS 2	0.48	4.477	-4.250	6.173	3.605	-2.425	4.345	3.678	3.884	5.349	-5.128	-3.083	5.983
D-DP4-WAS PUMP 2	0.48	2.657	-0.946	2.821	1.675	-0.415	1.725	0.818	2.302	2.443	-1.425	-2.179	2.603
D-MCC 1-EXHAUST 1	0.48	2.616	-1.028	2.810	1.668	-0.464	1.731	0.873	2.279	2.440	-1.479	-2.131	2.594
D-MCC 1-EXHAUST 2	0.48	2.616	-1.028	2.810	1.668	-0.464	1.731	0.873	2.279	2.440	-1.479	-2.131	2.594
D-MCC 1-EXHAUST 3	0.48	2.616	-1.028	2.810	1.668	-0.464	1.731	0.873	2.279	2.440	-1.479	-2.131	2.594
D-MCC 1-EXHAUST 4	0.48	2.616	-1.028	2.810	1.668	-0.464	1.731	0.873	2.279	2.440	-1.479	-2.131	2.594
D-MCC B1-AIR BLOWER	0.48	5.153	-9.112	10.468	5.764	-7.040	9.098	8.122	4.760	9.414	-10.695	-2.042	10.889
D-MCC B1-DAF THICK 2	0.48	2.871	-0.752	2.968	1.779	-0.287	1.803	0.627	2.499	2.577	-1.269	-2.412	2.726
D-MCC B1-EAST DAF RECYC	0.48	5.238	-8.735	10.186	5.724	-6.548	8.697	7.777	4.827	9.153	-10.294	-2.345	10.558
D-MCC B1-PRESSURIZATION	0.48	5.357	-6.529	8.445	5.041	-4.145	6.527	5.761	4.871	7.544	-7.811	-3.421	8.528

Project: MANATEE COUNTY ESS  
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 Config.: Normal

1.5-4 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
D-MCC B1-THICK WAS 3	0.48	5.427	-6.958	8.824	5.251	-4.595	6.978	6.077	4.942	7.833	-8.278	-3.270	8.900
D-MCC B1-THICK WAS 4	0.48	5.427	-6.958	8.824	5.251	-4.595	6.978	6.077	4.942	7.833	-8.278	-3.270	8.900
D-MCC B1-WEST DAF RECYC	0.48	5.238	-8.735	10.186	5.724	-6.548	8.697	7.777	4.827	9.153	-10.294	-2.345	10.558
D-MCC B2-AIR COMPRESSOR	0.48	5.168	-3.795	6.412	4.028	-1.926	4.465	3.282	4.485	5.557	-4.868	-3.905	6.240
D-MCC B2-EQ DIVERSION VLV	0.48	2.720	-0.707	2.810	1.688	-0.270	1.710	0.610	2.356	2.434	-1.219	-2.284	2.589
D-MCC B2-RETURN SLUDGE 1	0.48	3.873	-1.696	4.228	2.589	-0.726	2.689	1.466	3.357	3.663	-2.423	-3.152	3.976
D-MCC B2-RETURN SLUDGE 2	0.48	4.738	-2.664	5.436	3.391	-1.212	3.601	2.303	4.109	4.710	-3.590	-3.762	5.200
D-MCC B2-RETURN SLUDGE 3	0.48	4.275	-2.099	4.762	2.940	-0.920	3.080	1.814	3.707	4.126	-2.912	-3.446	4.512
D-MCC B2-RETURN SLUDGE 4	0.48	4.275	-2.099	4.762	2.940	-0.920	3.080	1.814	3.707	4.126	-2.912	-3.446	4.512
D-MCC B2-RETURN SLUDGE 5	0.48	3.873	-1.696	4.228	2.589	-0.726	2.689	1.466	3.357	3.663	-2.423	-3.152	3.976
D-MCC B3-STANDBY PRESSURE	0.48	5.309	-7.562	9.239	5.379	-5.228	7.502	6.679	4.841	8.249	-8.968	-2.934	9.435
D-MCC D1-BFP FEED PUMP	0.48	3.237	-1.464	3.553	2.148	-0.660	2.247	1.265	2.805	3.077	-2.059	-2.610	3.324
D-MCC D1-BFP FEED PUMP5	0.48	3.347	-1.709	3.758	2.269	-0.800	2.406	1.478	2.901	3.255	-2.323	-2.659	3.531
D-MCC D1-GRAVITY THICK	0.48	1.747	-0.390	1.790	1.061	-0.161	1.073	0.337	1.513	1.550	-0.717	-1.467	1.633
D-MCC D1-SLUDGE RECIRC 1	0.48	4.284	-3.875	5.776	3.460	-2.204	4.102	3.353	3.717	5.006	-4.748	-2.994	5.613
D-MCC D1-SLUDGE RECIRC 3	0.48	4.130	-3.349	5.317	3.200	-1.823	3.683	2.898	3.583	4.608	-4.161	-2.996	5.128
D-MCC D1-SLUDGE RECIRC 4	0.48	3.956	-2.917	4.915	2.962	-1.533	3.335	2.524	3.431	4.259	-3.675	-2.944	4.709
D-MCC D1-SLUDGE TRANSFER1	0.48	4.391	-4.515	6.298	3.731	-2.715	4.614	3.908	3.812	5.459	-5.453	-2.896	6.174
D-MCC D1-THICKENER	0.48	1.747	-0.390	1.790	1.061	-0.161	1.074	0.337	1.513	1.550	-0.717	-1.467	1.633
D-MCC D2-BFP FEED PUMP1	0.48	3.869	-2.279	4.490	2.737	-1.099	2.950	1.971	3.355	3.891	-3.008	-3.021	4.263
D-MCC D2-BFP FEED PUMP4	0.48	3.048	-1.287	3.308	1.994	-0.573	2.075	1.112	2.641	2.866	-1.845	-2.472	3.085
D-MCC D2-BFP FEED PUMP6	0.48	2.729	-1.016	2.912	1.748	-0.444	1.803	0.879	2.365	2.523	-1.516	-2.234	2.700
D-MCC D2-SLUDGE RECIRC 2	0.48	3.753	-2.269	4.386	2.660	-1.110	2.882	1.962	3.254	3.800	-2.971	-2.913	4.161
D-MCC D2-SLUDGE TRANSFER2	0.48	1.820	-0.458	1.877	1.113	-0.194	1.130	0.396	1.577	1.626	-0.796	-1.520	1.716
D-MCC D2-SLUDGE TRANSFER3	0.48	3.471	-1.870	3.943	2.384	-0.887	2.543	1.617	3.009	3.416	-2.510	-2.740	3.716
D-MCC D2-SLUDGE TRANSFER4	0.48	4.527	-4.531	6.405	3.837	-2.692	4.688	3.922	3.929	5.552	-5.508	-3.030	6.286
D-MCC DW1-PLANT DRAIN1	0.48	2.091	-0.551	2.163	1.288	-0.228	1.308	0.476	1.812	1.873	-0.940	-1.746	1.983
D-MCC DW1-PLANT DRAIN2	0.48	2.091	-0.551	2.163	1.288	-0.228	1.308	0.476	1.812	1.873	-0.940	-1.746	1.983
D-MCC DW1-PLANT DRAIN3	0.48	2.091	-0.551	2.163	1.288	-0.228	1.308	0.476	1.812	1.873	-0.940	-1.746	1.983
D-MCC E1-EF-7	0.48	2.545	-0.686	2.636	1.569	-0.278	1.593	0.593	2.204	2.282	-1.157	-2.126	2.420

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1.5-4 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus ID	kV	3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
		Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
D-MCC E1-FLASH MIXER 1	0.48	0.505	-0.038	0.507	0.296	-0.016	0.296	0.033	0.438	0.439	-0.137	-0.433	0.454
D-MCC E1-FLASH MIXER 2	0.48	0.860	-0.105	0.866	0.507	-0.044	0.509	0.091	0.745	0.750	-0.271	-0.732	0.780
D-MCC E2-EF-5.1	0.48	1.631	-0.271	1.653	0.975	-0.106	0.981	0.234	1.412	1.432	-0.582	-1.383	1.500
D-MCC E2-EF-5.2	0.48	1.631	-0.271	1.653	0.975	-0.106	0.981	0.234	1.412	1.432	-0.582	-1.383	1.500
D-MCC HW1-CONVEYOR EAST	0.48	3.741	-1.406	3.996	2.426	-0.574	2.493	1.215	3.241	3.461	-2.102	-3.083	3.731
D-MCC HW1-FINAL CLAR. 3	0.48	0.265	-0.012	0.265	0.155	-0.005	0.155	0.010	0.230	0.230	-0.065	-0.228	0.237
D-MCC HW1-FINAL CLAR. 4	0.48	0.269	-0.012	0.269	0.157	-0.005	0.157	0.010	0.233	0.233	-0.066	-0.232	0.241
D-MCC HW1-GRIT CLASS WEST	0.48	1.212	-0.155	1.222	0.719	-0.060	0.721	0.134	1.050	1.058	-0.389	-1.033	1.104
D-MCC HW1-PRI. SLUDGE	0.48	0.381	-0.024	0.382	0.223	-0.010	0.223	0.021	0.330	0.330	-0.100	-0.327	0.341
D-MCC HW1-RSP 4	0.48	3.474	-2.202	4.113	2.432	-1.106	2.671	1.905	3.012	3.564	-2.823	-2.664	3.881
D-MCC HW1-RSP 5	0.48	3.474	-2.202	4.113	2.432	-1.106	2.671	1.905	3.012	3.564	-2.823	-2.664	3.881
D-MCC HW1-WEST CONVEYOR	0.48	1.162	-0.144	1.171	0.688	-0.056	0.691	0.124	1.006	1.014	-0.368	-0.991	1.057
D-MCC HW2-GRIT CLASS 2	0.48	1.847	-0.337	1.878	1.111	-0.130	1.119	0.291	1.600	1.626	-0.688	-1.564	1.709
D-MCC HW2-GRIT PUMP 2	0.48	3.236	-1.069	3.408	2.053	-0.433	2.098	0.924	2.804	2.952	-1.669	-2.684	3.161
D-MCC HW2-PRI. SLUDGE 1	0.48	0.525	-0.039	0.526	0.308	-0.016	0.308	0.034	0.454	0.456	-0.143	-0.450	0.472
D-MCC HW2-PRI. SLUDGE 3	0.48	0.525	-0.039	0.526	0.308	-0.016	0.308	0.034	0.454	0.456	-0.143	-0.450	0.472
D-MCC HW2-RSP 6	0.48	3.440	-2.198	4.082	2.410	-1.108	2.652	1.902	2.983	3.538	-2.812	-2.633	3.852
D-MCC HW2-WAS PUMP 3	0.48	0.830	-0.098	0.836	0.490	-0.041	0.492	0.084	0.719	0.724	-0.258	-0.707	0.753
D-MCC HW2-WAS PUMP 4	0.48	0.830	-0.098	0.836	0.490	-0.041	0.492	0.084	0.719	0.724	-0.258	-0.707	0.753
D-MCCB4-SUBM PUMP START	0.48	2.123	-0.546	2.192	1.304	-0.225	1.323	0.472	1.839	1.899	-0.940	-1.775	2.008
DAF THICKENER 2 AFD	0.48	6.059	-4.322	7.442	4.758	-2.096	5.200	3.680	5.409	6.542	-5.513	-4.736	7.268
DAVIS SCRUBBER	0.48	5.152	-6.386	8.205	4.820	-4.133	6.349	5.531	4.476	7.116	-7.632	-3.043	8.216
DEEP WELL PUMP 1 VFD	0.48	2.988	-13.683	14.006	3.379	-13.815	14.223	12.293	2.733	12.593	-13.849	3.794	14.359
DEEP WELL PUMP 2 VFD	0.48	3.211	-13.762	14.131	3.783	-13.466	13.987	12.671	3.051	13.033	-14.259	2.880	14.547
DEEP WELL PUMP 3 VFD	0.48	3.027	-14.605	14.916	3.453	-14.862	15.258	13.449	2.889	13.756	-14.811	3.882	15.311
DEEP WELL PUMP 4 VFD	0.48	3.418	-12.396	12.858	3.840	-11.809	12.418	11.168	3.105	11.592	-12.947	2.159	13.125
DEEP WELL PUMP 5 VFD	0.48	3.535	-12.910	13.385	4.064	-12.115	12.778	11.947	3.329	12.402	-13.642	1.778	13.757
DEEP WELL PUMP 6 VFD	0.48	3.503	-13.187	13.644	4.023	-12.535	13.165	12.203	3.301	12.642	-13.875	2.037	14.024
DEGRITTER CP	0.48	2.861	-0.838	2.981	1.786	-0.336	1.817	0.724	2.478	2.582	-1.369	-2.385	2.750
DP1 MAIN LS	0.48	3.437	-7.361	8.124	3.469	-5.664	6.642	6.380	2.989	7.045	-8.006	-0.729	8.039
DP2 MAIN LS	0.48	3.443	-7.451	8.208	3.490	-5.759	6.734	6.458	2.994	7.118	-8.100	-0.689	8.129
DP4 MAIN LS	0.48	3.249	-7.817	8.466	3.342	-6.216	7.058	6.777	2.825	7.342	-8.374	-0.283	8.379
EFF. FILTER PS CNTRL	0.48	3.723	-7.469	8.346	3.775	-5.687	6.825	6.474	3.236	7.237	-8.243	-0.992	8.303

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 Config.: Normal

1.5-4 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
ELECTRIC ROLL-UP DOOR	0.48	3.106	-1.531	3.463	2.060	-0.720	2.183	1.303	2.715	3.012	-2.062	-2.482	3.226
EQ TANK RETURN	0.48	2.487	-0.593	2.557	1.531	-0.226	1.547	0.512	2.154	2.214	-1.062	-2.094	2.348
FPL PRIMARY	23.00	0.154	-1.303	1.312	0.000	0.000	0.000	1.142	0.140	1.150	1.142	0.140	1.150
FPL SERVICE	4.16	1.513	-17.702	17.767	2.247	-23.665	23.771	15.810	1.500	15.881	14.123	17.684	22.632
HOIST	0.48	5.659	-4.040	6.953	4.453	-1.990	4.877	3.493	4.911	6.027	-5.249	-4.334	6.807
LIGHTING PANEL	0.21	0.978	-1.245	1.584	1.021	-1.103	1.503	1.079	0.850	1.374	-1.596	-0.364	1.637
LTG. PNL	0.21	1.018	-1.598	1.895	1.056	-1.605	1.921	1.384	0.882	1.641	-1.931	-0.077	1.932
MAIN GATE CP	0.48	0.750	-0.083	0.755	0.442	-0.035	0.443	0.071	0.650	0.654	-0.228	-0.640	0.679
MCC 1	0.48	3.752	-5.801	6.909	3.483	-4.029	5.326	5.070	3.377	6.092	-6.526	-1.858	6.785
MCC B1	0.48	3.203	-12.521	12.924	3.661	-12.643	13.162	11.310	3.048	11.713	-12.890	2.909	13.214
MCC B2	0.48	3.002	-11.995	12.365	3.228	-12.306	12.723	10.417	2.620	10.742	-12.118	3.667	12.660
MCC B3	0.48	3.250	-12.259	12.683	3.712	-12.258	12.808	11.018	3.080	11.441	-12.657	2.699	12.942
MCC B4	0.48	3.002	-11.995	12.365	3.228	-12.306	12.722	10.417	2.620	10.741	-12.118	3.667	12.660
MCC D1	0.48	3.189	-8.341	8.930	3.397	-7.180	7.943	7.235	2.776	7.749	-8.936	0.341	8.942
MCC D2	0.48	3.186	-8.296	8.886	3.388	-7.124	7.889	7.195	2.773	7.711	-8.889	0.315	8.895
MCC D4 LS	0.48	3.012	-10.996	11.401	3.370	-11.100	11.600	9.844	2.821	10.241	-11.350	2.492	11.620
MCC D5 LS	0.48	3.012	-10.995	11.400	3.370	-11.098	11.598	9.841	2.823	10.238	-11.347	2.491	11.617
MCC DW1	0.48	3.064	-11.582	11.980	3.306	-11.854	12.306	10.055	2.674	10.404	-11.805	3.371	12.276
MCC DW2	0.48	3.063	-11.581	11.979	3.305	-11.854	12.306	10.054	2.672	10.403	-11.804	3.372	12.276
MCC E1	0.48	2.893	-11.694	12.047	3.196	-11.231	11.677	10.147	2.525	10.457	-11.845	2.852	12.183
MCC E2	0.48	2.881	-11.857	12.202	3.180	-11.459	11.892	10.289	2.513	10.592	-11.982	3.004	12.353
MCC HW 1	0.48	2.865	-12.381	12.708	3.088	-12.484	12.860	10.748	2.501	11.035	-12.374	3.768	12.935
MCC HW 2	0.48	2.891	-12.061	12.403	3.143	-11.988	12.393	10.473	2.522	10.772	-12.136	3.406	12.605
MCC-D4	0.48	3.012	-10.996	11.401	3.370	-11.100	11.600	9.844	2.821	10.241	-11.350	2.492	11.620
MCC-D5	0.48	3.012	-10.995	11.400	3.370	-11.098	11.598	9.841	2.823	10.238	-11.347	2.491	11.617
MCC1 LS	0.48	3.752	-5.801	6.909	3.483	-4.029	5.326	5.070	3.377	6.092	-6.526	-1.858	6.785
MCCB1 LS	0.48	3.203	-12.521	12.924	3.661	-12.643	13.162	11.310	3.048	11.713	-12.890	2.909	13.214
MCCD1 LS	0.48	3.189	-8.341	8.930	3.397	-7.180	7.943	7.235	2.776	7.749	-8.936	0.341	8.942
MCCD2 LS	0.48	3.186	-8.296	8.886	3.388	-7.124	7.889	7.195	2.773	7.711	-8.889	0.315	8.895
MECH SCREEN CP	0.48	2.503	-0.588	2.571	1.534	-0.225	1.550	0.508	2.168	2.227	-1.059	-2.107	2.358
MOV RATE OF FLOW	0.48	0.861	-0.104	0.867	0.508	-0.044	0.510	0.090	0.745	0.751	-0.270	-0.732	0.781
MTS-AC1-LOAD	0.48	1.715	-0.313	1.743	1.034	-0.119	1.041	0.263	1.488	1.511	-0.633	-1.452	1.584
MTS-MCC D4 LINE	0.48	1.715	-0.313	1.743	1.034	-0.119	1.041	0.263	1.488	1.511	-0.633	-1.452	1.584
MTS-MCC D5-LINE	0.48	1.715	-0.313	1.743	1.034	-0.119	1.041	0.263	1.488	1.511	-0.633	-1.452	1.584



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**ETAP**  
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Study Case: SC

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 Date: 12-18-2014  
 SN: CAROLLOWAN  
 Revision: Base  
 Config.: Normal

1.5-4 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
NEW MAINT. BLDG	0.48	3.380	-6.232	7.089	3.302	-4.681	5.729	5.401	2.937	6.148	-6.917	-1.102	7.005
OLD MAINTENANCE BLDG	0.48	3.821	-2.738	4.701	2.825	-1.427	3.165	2.369	3.314	4.074	-3.461	-2.861	4.491
PLANT DRAIN #3	0.48	3.348	-11.089	11.584	3.801	-11.008	11.646	9.625	2.921	10.059	-11.716	2.510	11.982
PLANT DRAIN PS CTL PNL	0.48	3.650	-6.556	7.504	3.523	-4.757	5.920	5.681	3.170	6.506	-7.274	-1.349	7.398
PMS-7A LS	4.16	3.328	-8.018	8.681	3.247	-4.766	5.767	7.037	2.995	7.647	-8.336	-1.362	8.446
PMS-8A LS	4.16	3.328	-8.018	8.681	3.247	-4.766	5.767	7.037	2.995	7.648	-8.336	-1.362	8.447
PNL CP	0.21	0.856	-0.928	1.262	0.872	-1.001	1.327	0.804	0.741	1.093	0.362	1.282	1.332
PNL DP #1	0.48	3.437	-7.361	8.124	3.469	-5.664	6.642	6.380	2.989	7.045	-8.006	-0.729	8.039
PNL DP #2	0.48	3.443	-7.451	8.208	3.490	-5.759	6.734	6.458	2.994	7.118	-8.100	-0.689	8.129
PNL DP #4	0.48	3.249	-7.817	8.466	3.342	-6.216	7.058	6.777	2.825	7.342	-8.374	-0.283	8.379
PNL L1	0.21	1.477	-2.024	2.506	1.361	-1.593	2.096	1.753	1.280	2.171	-2.372	-0.631	2.454
PNL LB1	0.21	1.036	-1.565	1.877	1.067	-1.582	1.908	1.355	0.897	1.625	-1.905	-0.098	1.907
PNL LC1/LC2	0.21	1.053	-1.462	1.801	1.103	-1.371	1.760	1.266	0.912	1.560	-1.836	-0.272	1.856
PNL LD	0.21	0.912	-1.367	1.644	0.936	-1.420	1.701	1.184	0.790	1.424	0.704	1.528	1.683
PNL LD 2	0.21	0.966	-1.460	1.751	1.001	-1.488	1.793	1.264	0.837	1.516	-1.783	-0.078	1.785
PNL LDW	0.21	0.966	-1.474	1.763	0.988	-1.516	1.810	1.277	0.837	1.527	0.771	1.617	1.792
PNL LHW	0.21	1.010	-1.647	1.932	1.044	-1.672	1.971	1.426	0.875	1.673	-1.966	-0.027	1.966
PNL LP1	0.21	0.540	-0.588	0.798	0.551	-0.589	0.807	0.509	0.469	0.692	-0.789	-0.173	0.808
PNL LP2	0.21	0.551	-0.601	0.816	0.558	-0.588	0.810	0.521	0.477	0.706	-0.803	-0.190	0.825
PNL P3	0.48	4.481	-9.943	10.906	5.307	-8.722	10.210	8.626	3.904	9.468	-11.481	-0.141	11.482
PNL PC/TC-2	0.21	1.033	-1.576	1.884	1.081	-1.546	1.887	1.365	0.895	1.632	-1.928	-0.138	1.933
PNL PC/TC-3	0.21	1.065	-1.430	1.783	1.109	-1.350	1.747	1.239	0.923	1.545	-1.810	-0.288	1.833
PNL PC/TC-4	0.21	0.994	-1.355	1.681	1.033	-1.308	1.667	1.174	0.861	1.456	-1.708	-0.231	1.723
PNL XLC	0.21	0.293	-0.488	0.569	0.295	-0.495	0.576	0.423	0.254	0.493	0.274	0.504	0.574
PNL XLC (2)	0.21	0.293	-0.489	0.570	0.295	-0.495	0.577	0.424	0.253	0.494	0.275	0.504	0.574
PNL-P1	0.48	3.788	-3.443	5.119	2.920	-1.943	3.507	2.981	3.285	4.436	-4.133	-2.639	4.904
PNL-P4	0.48	5.005	-5.646	7.545	4.413	-3.465	5.610	4.889	4.345	6.541	-6.747	-3.170	7.454
POLYMER FEED 5, 6	0.48	2.536	-0.682	2.626	1.576	-0.269	1.599	0.589	2.197	2.274	-1.158	-2.123	2.418
POLYMER FEED CP	0.48	2.294	-0.565	2.362	1.413	-0.222	1.430	0.488	1.987	2.046	-0.996	-1.926	2.168
POLYMER MIX CP	0.48	2.294	-0.565	2.362	1.413	-0.222	1.430	0.488	1.987	2.046	-0.996	-1.926	2.168
RAS 1 VFD	0.48	3.754	-6.795	7.762	3.670	-4.969	6.178	5.887	3.263	6.731	-7.559	-1.352	7.679
RAS 2 VFD	0.48	3.630	-7.145	8.014	3.620	-5.371	6.477	6.193	3.155	6.950	-7.870	-1.051	7.939
RAS 3 VFD	0.48	3.754	-6.795	7.762	3.670	-4.969	6.178	5.887	3.263	6.731	-7.559	-1.352	7.679
RAS 7 VFD	0.48	3.737	-6.716	7.685	3.638	-4.894	6.098	5.819	3.248	6.664	-7.471	-1.371	7.596

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1.5-4 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
RAS 8 VFD	0.48	3.737	-6.716	7.685	3.638	-4.894	6.098	5.819	3.248	6.664	-7.471	-1.371	7.596
REUSE LIFT STATION PUMP	0.48	1.628	-0.273	1.651	0.974	-0.107	0.980	0.236	1.410	1.430	-0.583	-1.380	1.498
ROOF A/C #1	0.48	1.384	-0.272	1.411	0.829	-0.116	0.837	0.236	1.199	1.222	-0.531	-1.164	1.280
S-DEEP WELL 2 LOAD	0.48	3.027	-14.605	14.916	3.453	-14.862	15.258	13.449	2.890	13.756	-14.810	3.881	15.310
S-DEEP WELL 5 LOAD	0.48	3.479	-13.377	13.822	3.988	-12.829	13.435	12.380	3.280	12.807	-14.030	2.223	14.205
S-MCC D1-PNL LD	0.48	4.453	-3.995	5.982	3.617	-2.261	4.266	3.457	3.864	5.185	-4.918	-3.127	5.828
S-MCC D2-PNL LD	0.48	4.435	-3.984	5.962	3.601	-2.257	4.250	3.448	3.849	5.167	-4.902	-3.113	5.807
S-MCC DW1-PNL LDW	0.48	5.767	-5.443	7.930	5.110	-3.117	5.986	4.710	5.008	6.875	-6.852	-4.031	7.950
S-MCC DW2-PNL LDW	0.48	5.766	-5.443	7.929	5.110	-3.117	5.986	4.711	5.007	6.875	-6.852	-4.031	7.950
S-MCC HW1-PNL LHW	0.48	5.793	-8.712	10.462	6.262	-6.324	8.900	7.549	5.038	9.076	-10.544	-2.738	10.894
S-MCC HW2-PNL LHW	0.48	4.938	-9.817	10.989	5.731	-8.080	9.906	8.515	4.300	9.539	-11.476	-1.017	11.521
S-MCCB2-PNL LB1	0.48	5.866	-7.773	9.738	6.103	-5.366	8.126	6.735	5.101	8.449	-9.567	-3.228	10.097
S-MCCB2-PNL P3	0.48	4.021	-10.762	11.489	4.826	-10.098	11.192	9.341	3.505	9.977	-12.041	1.164	12.097
S-MCCB3-PNL LB1	0.48	6.088	-7.776	9.875	6.160	-5.179	8.048	6.782	5.555	8.767	-9.426	-3.682	10.119
S-MCCB3-PNL P3	0.48	4.279	-10.936	11.743	5.159	-9.928	11.188	9.753	4.004	10.543	-12.226	0.349	12.231
S-MCCE1-PNL P4	0.48	4.841	-5.030	6.982	4.099	-2.977	5.066	4.354	4.202	6.051	-6.043	-3.207	6.842
S-MCCE2-PNL P4	0.48	5.079	-6.332	8.117	4.692	-4.071	6.212	5.484	4.411	7.038	-7.514	-2.998	8.090
S-PNL L1-LOAD	0.48	4.535	-10.217	11.178	5.290	-8.637	10.128	8.860	3.947	9.699	-11.630	-0.327	11.635
S-PNL LB1-LOAD	0.48	5.866	-7.773	9.738	6.103	-5.366	8.126	6.735	5.101	8.449	-9.567	-3.228	10.097
S-PNL LD LOAD	0.48	4.435	-3.984	5.962	3.601	-2.257	4.250	3.448	3.849	5.167	-4.902	-3.113	5.807
S-PNL LDW LOAD	0.48	5.766	-5.443	7.929	5.110	-3.117	5.986	4.711	5.007	6.875	-6.852	-4.031	7.950
S-PNL LHW LOAD	0.48	4.938	-9.817	10.989	5.731	-8.080	9.906	8.515	4.300	9.539	-11.476	-1.017	11.521
S-PNL P1-LOAD	0.48	4.535	-10.217	11.178	5.290	-8.637	10.128	8.860	3.947	9.699	-11.630	-0.327	11.635
S-PNL P3-LOAD	0.48	4.021	-10.762	11.489	4.826	-10.098	11.192	9.341	3.505	9.977	-12.041	1.164	12.097
S-PNL P4-LOAD	0.48	5.079	-6.332	8.117	4.692	-4.071	6.212	5.484	4.411	7.038	-7.514	-2.998	8.090
S-SUB1-PNL L1	0.48	4.054	-11.399	12.098	4.908	-10.461	11.556	9.888	3.533	10.500	-12.615	1.206	12.673
S-SUB1-PNL P1	0.48	4.054	-11.399	12.098	4.908	-10.461	11.556	9.888	3.533	10.500	-12.615	1.206	12.673
S-SUB2-PNL L1	0.48	4.535	-10.217	11.178	5.290	-8.637	10.128	8.860	3.947	9.699	-11.630	-0.327	11.635
S-SUB2-PNL P1	0.48	4.535	-10.217	11.178	5.290	-8.637	10.128	8.860	3.947	9.699	-11.630	-0.327	11.635
S-SUB9-DEEP WELL 2	0.48	3.061	-13.401	13.746	3.479	-13.395	13.839	11.990	2.803	12.314	-13.619	3.519	14.066
S-SUB10-DEEP WELL 2	0.48	3.027	-14.605	14.916	3.453	-14.862	15.258	13.449	2.890	13.756	-14.810	3.881	15.310
S-SWBD11-DEEP WELL 5	0.48	3.410	-12.531	12.987	3.816	-12.035	12.625	11.264	3.101	11.683	-13.035	2.327	13.241
S-SWBD12-DEEP WELL 5	0.48	3.479	-13.377	13.822	3.988	-12.829	13.435	12.380	3.280	12.807	-14.030	2.223	14.205
SCUM EJECTOR CP	0.48	0.896	-0.109	0.902	0.529	-0.045	0.531	0.094	0.776	0.782	-0.282	-0.763	0.813

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1.5-4 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
SEC CLARIFIERS 3, 4	0.48	0.683	-0.072	0.687	0.402	-0.031	0.403	0.063	0.592	0.595	-0.205	-0.582	0.617
SLUDGE THICKENER DRIVE	0.48	3.450	-1.217	3.658	2.224	-0.491	2.277	1.051	2.989	3.169	-1.863	-2.855	3.409
SLUICE GATE 2	0.48	0.592	-0.048	0.594	0.347	-0.020	0.348	0.041	0.512	0.514	-0.164	-0.506	0.532
SLUICE GATE #4	0.48	0.591	-0.048	0.593	0.347	-0.020	0.347	0.042	0.512	0.514	-0.164	-0.506	0.532
SODIUM BICARBONATE CP	0.48	4.041	-5.673	6.965	3.782	-3.899	5.432	4.915	3.511	6.040	-6.583	-2.081	6.904
SUB 1 BUS A	0.48	2.729	-13.346	13.622	2.869	-13.793	14.088	11.585	2.385	11.828	-13.059	4.723	13.887
SUB1 FEED	4.16	2.078	-16.514	16.644	4.189	-19.485	19.930	14.708	1.998	14.844	-18.003	9.030	20.141
SUB1 LS	0.48	2.729	-13.346	13.622	2.869	-13.793	14.088	11.585	2.385	11.828	-13.059	4.723	13.887
SUB1/SUB9	4.16	1.569	-17.642	17.712	2.415	-23.435	23.559	15.756	1.549	15.832	-17.097	14.526	22.435
SUB 2 BUS B	0.48	2.724	-13.364	13.639	2.864	-13.806	14.100	11.601	2.379	11.843	-13.075	4.732	13.905
SUB2 FEED	4.16	1.978	-16.755	16.871	3.913	-20.280	20.654	14.931	1.911	15.052	-18.045	10.017	20.639
SUB2 LS	0.48	2.724	-13.364	13.639	2.864	-13.806	14.100	11.601	2.379	11.843	-13.075	4.732	13.905
SUB2/SUB10	4.16	1.570	-17.641	17.711	2.417	-23.433	23.557	15.754	1.550	15.830	-17.096	14.525	22.433
SUB 3 BUS A	0.48	2.793	-13.064	13.359	2.913	-13.593	13.902	11.343	2.439	11.602	9.837	9.477	13.659
SUB3 FEED	4.16	2.992	-13.490	13.818	5.096	-11.758	12.815	11.961	2.776	12.279	-14.785	2.051	14.926
SUB3 MAIN LS	0.48	2.793	-13.064	13.359	2.913	-13.593	13.902	11.343	2.439	11.602	9.837	9.477	13.659
SUB 4 BUS B	0.48	2.793	-13.062	13.357	2.913	-13.595	13.904	11.345	2.439	11.604	9.837	9.475	13.658
SUB4 FEED	4.16	2.994	-13.473	13.802	5.099	-11.653	12.720	11.982	2.781	12.300	-14.765	1.950	14.893
SUB4 MAIN LS	0.48	2.793	-13.062	13.357	2.913	-13.595	13.904	11.345	2.439	11.604	9.837	9.475	13.658
SUB 5 BUS A	0.48	2.899	-12.531	12.862	2.993	-13.209	13.544	10.884	2.531	11.175	9.354	9.462	13.305
SUB5 FEED	4.16	3.319	-9.636	10.192	3.827	-6.210	7.295	8.503	3.007	9.019	-10.128	-0.839	10.163
SUB5 MAIN LS	0.48	2.899	-12.531	12.862	2.993	-13.209	13.544	10.884	2.531	11.175	9.354	9.462	13.305
SUB 6 BUS B	0.48	3.043	-13.409	13.750	3.290	-14.203	14.579	12.091	2.910	12.436	10.485	9.750	14.318
SUB6 FEED	4.16	3.308	-9.657	10.207	3.816	-6.164	7.249	8.580	3.011	9.093	-10.168	-0.886	10.206
SUB6 MAIN LS	0.48	3.043	-13.409	13.750	3.290	-14.203	14.579	12.091	2.910	12.436	10.485	9.750	14.318
SUB 7 BUS A	0.48	2.948	-12.262	12.612	3.031	-13.008	13.357	10.648	2.573	10.955	9.107	9.450	13.124
SUB7 FEED	4.16	3.238	-8.317	8.925	3.288	-4.938	5.933	7.303	2.919	7.865	-8.628	-1.235	8.716
SUB7 MAIN LS	0.48	2.948	-12.262	12.612	3.031	-13.008	13.357	10.648	2.573	10.955	9.107	9.450	13.124
SUB7/SUB11	4.16	1.570	-17.641	17.711	2.417	-23.433	23.557	15.754	1.550	15.830	-17.096	14.525	22.433
SUB 8 BUS B	0.48	2.948	-12.264	12.613	3.033	-13.009	13.358	10.649	2.574	10.956	9.109	9.452	13.126
SUB8 FEED	4.16	3.238	-8.317	8.925	3.288	-4.938	5.933	7.304	2.920	7.866	-8.628	-1.235	8.716
SUB8 MAIN LS	0.48	2.948	-12.264	12.613	3.033	-13.009	13.358	10.649	2.574	10.956	9.109	9.452	13.126
SUB8/SUB12	4.16	1.569	-17.642	17.712	2.415	-23.435	23.559	15.756	1.549	15.832	-17.097	14.526	22.435
SUB 9 BUS A	0.48	2.841	-14.291	14.571	3.067	-14.853	15.166	12.819	2.607	13.081	-14.143	4.632	14.882

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SUB9 FEED	4.16	2.168	-16.290	16.434	4.414	-18.751	19.264	14.508	2.075	14.655	-17.905	8.159	19.677
SUB9 LS	0.48	2.841	-14.291	14.571	3.067	-14.853	15.166	12.819	2.607	13.081	-14.143	4.632	14.882
SUB 10 BUS B	0.48	2.908	-15.060	15.339	3.206	-15.646	15.971	13.870	2.784	14.147	-15.046	4.474	15.697
SUB10 FEED	4.16	2.118	-16.416	16.552	4.304	-19.134	19.612	14.628	2.031	14.768	-17.979	8.590	19.925
SUB10 LS	0.48	2.908	-15.060	15.339	3.206	-15.646	15.971	13.870	2.784	14.147	-15.046	4.474	15.697
SUB11 LS	0.48	3.314	-14.219	14.600	3.576	-14.770	15.196	12.745	3.020	13.098	-14.340	4.187	14.939
SUB12 LS	0.48	3.387	-14.976	15.354	3.723	-15.539	15.979	13.763	3.203	14.131	-15.218	4.031	15.743
SUBNATANT PUMP	0.48	5.777	-6.599	8.770	5.409	-4.113	6.795	5.737	5.246	7.774	-7.967	-3.791	8.823
SUPERANANT PS CP	0.48	3.579	-4.466	5.723	3.098	-2.887	4.234	3.868	3.107	4.961	-5.173	-2.076	5.574
SWBD 11 BUS A	0.48	3.369	-12.824	13.259	3.757	-12.476	13.030	11.538	3.064	11.938	-13.272	2.617	13.528
SWBD11 LS	0.48	3.369	-12.824	13.259	3.757	-12.476	13.030	11.538	3.064	11.938	-13.272	2.617	13.528
SWBD 12 BUS B	0.48	3.437	-13.672	14.097	3.920	-13.293	13.859	12.654	3.242	13.062	-14.262	2.523	14.484
SWBD12 LS	0.48	3.437	-13.672	14.097	3.920	-13.293	13.859	12.654	3.242	13.062	-14.262	2.523	14.484
SWGR BUS A	4.16	1.569	-17.642	17.712	2.415	-23.435	23.559	15.756	1.549	15.832	-17.097	14.526	22.435
SWGR BUS B	4.16	1.570	-17.641	17.711	2.417	-23.433	23.557	15.754	1.550	15.830	-17.096	14.525	22.433
SWGR MAIN 1 LS	4.16	1.570	-17.641	17.711	2.417	-23.433	23.557	15.754	1.550	15.830	-17.096	14.525	22.433
SWGR MAIN 2 LS	4.16	1.569	-17.642	17.712	2.415	-23.435	23.559	15.756	1.549	15.832	-17.097	14.526	22.435
SWITCH 11	4.16	2.213	-16.173	16.324	4.512	-18.390	18.936	14.400	2.115	14.554	-17.830	7.757	19.444
SWITCH 12	4.16	2.164	-16.301	16.444	4.412	-18.767	19.278	14.523	2.071	14.670	-17.919	8.165	19.691
T-AC-1	0.48	1.152	-0.152	1.162	0.685	-0.059	0.687	0.128	0.999	1.007	-0.372	-0.981	1.049
T-BLOWER AB1	4.16	3.995	-7.037	8.092	3.288	-4.169	5.310	6.214	3.595	7.179	-7.457	-2.156	7.762
T-BLOWER AB2	4.16	3.952	-7.169	8.186	3.300	-4.243	5.375	6.333	3.559	7.265	-7.584	-2.098	7.869
T-BLOWER AB3	4.16	3.905	-7.302	8.281	3.311	-4.318	5.441	6.454	3.518	7.351	-7.713	-2.035	7.977
T-BLOWER AB4	4.16	3.855	-7.413	8.355	3.330	-4.417	5.532	6.514	3.453	7.373	-7.807	-1.926	8.041
T-BLOWER AB5	4.16	3.799	-7.549	8.451	3.339	-4.497	5.602	6.637	3.405	7.459	-7.939	-1.853	8.152
T-DEEP WELL PUMP 1	0.48	3.224	-8.447	9.041	3.419	-6.582	7.417	7.785	2.917	8.314	-9.194	-0.488	9.207
T-DEEP WELL PUMP 2	0.48	3.304	-8.370	8.998	3.444	-6.355	7.228	7.807	3.067	8.387	-9.137	-0.779	9.170
T-DEEP WELL PUMP 3	0.48	3.338	-8.606	9.231	3.513	-6.607	7.483	8.018	3.100	8.597	-9.387	-0.702	9.413
T-DEEP WELL PUMP 4	0.48	3.205	-7.767	8.402	3.251	-5.886	6.724	7.193	2.901	7.756	-8.489	-0.777	8.525
T-DEEP WELL PUMP 5	0.48	3.294	-7.879	8.540	3.314	-5.854	6.727	7.389	3.057	7.996	-8.636	-0.989	8.692
T-DEEP WELL PUMP 6	0.48	3.301	-7.913	8.574	3.326	-5.888	6.763	7.420	3.063	8.027	-8.672	-0.981	8.727
T-DP1-WAS PUMP 5	0.48	1.375	-0.262	1.400	0.823	-0.111	0.830	0.226	1.191	1.213	-0.519	-1.158	1.269
T-DP1-WAS PUMP 6	0.48	1.375	-0.262	1.400	0.823	-0.111	0.830	0.226	1.191	1.213	-0.519	-1.158	1.269
T-DP2-WAS PUMP 1	0.48	2.615	-0.927	2.774	1.646	-0.407	1.696	0.801	2.265	2.403	-1.398	-2.144	2.559

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1.5-4 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
T-DP2-WAS PUMP 2	0.48	2.615	-0.927	2.774	1.646	-0.407	1.696	0.801	2.265	2.403	-1.398	-2.144	2.559
T-GEN 1	4.16	0.110	-2.081	2.083	0.256	-3.084	3.095	1.833	0.149	1.839	-1.970	2.692	3.336
T-GEN 2	4.16	0.123	-2.337	2.340	0.267	-2.883	2.895	2.034	0.166	2.041	-2.180	1.723	2.778
T-MCC D4-BLOWER 1	0.48	3.603	-4.286	5.599	3.099	-2.650	4.078	3.818	3.239	5.007	-5.026	-2.330	5.540
T-MCC D4-BLOWER 3	0.48	3.793	-4.855	6.161	3.401	-3.117	4.613	4.318	3.416	5.506	-5.674	-2.327	6.132
T-MCC D4-PMP 1	0.48	3.436	-2.792	4.427	2.589	-1.486	2.985	2.468	3.062	3.933	-3.430	-2.580	4.292
T-MCC D4-PMP 3	0.48	3.773	-3.353	5.048	2.968	-1.849	3.497	2.956	3.368	4.482	-4.081	-2.760	4.927
T-MCC D5-BLOWER 2	0.48	3.371	-3.736	5.032	2.785	-2.231	3.568	3.337	3.026	4.505	-4.400	-2.275	4.953
T-MCC D5-BLOWER 4	0.48	3.793	-4.855	6.161	3.400	-3.116	4.612	4.317	3.416	5.505	-5.673	-2.326	6.131
T-MCC D5-PMP 2	0.48	3.137	-2.379	3.937	2.290	-1.236	2.603	2.111	2.793	3.501	-2.950	-2.398	3.801
T-MCC D5-PMP 4	0.48	3.773	-3.353	5.048	2.968	-1.849	3.496	2.956	3.368	4.481	-4.081	-2.759	4.926
T-MCCD1-PNL LD	0.21	0.909	-1.391	1.661	0.928	-1.463	1.733	1.205	0.787	1.439	0.731	1.558	1.721
T-MCCDW1-PNL LDW	0.21	0.962	-1.501	1.783	0.979	-1.564	1.845	1.300	0.834	1.545	0.803	1.650	1.835
T-MCCHW1-PNL LHW 2	0.21	1.004	-1.679	1.956	1.030	-1.729	2.013	1.454	0.870	1.694	0.925	1.760	1.988
T-SUB2-PNL CP	0.21	0.861	-0.956	1.286	0.876	-1.054	1.371	0.828	0.746	1.114	0.386	1.329	1.384
T-SUB11-SWBD11	0.48	3.314	-14.219	14.600	3.576	-14.770	15.196	12.745	3.020	13.098	-14.340	4.187	14.939
T-SUB12-SWBD12	0.48	3.387	-14.976	15.354	3.723	-15.539	15.979	13.763	3.203	14.131	-15.218	4.031	15.743
T-TR-DP1-XLC	0.48	4.326	-5.161	6.734	3.753	-3.233	4.953	4.469	3.755	5.837	-6.042	-2.630	6.590
T-TR-DP4-XLC	0.48	4.376	-5.498	7.026	3.882	-3.518	5.239	4.761	3.799	6.091	-6.410	-2.561	6.903
T-TR-MCC 1-PNL XFMR	0.48	4.012	-3.759	5.498	3.175	-2.153	3.837	3.243	3.559	4.815	-4.484	-2.812	5.293
T-TR-MCC 1-PNL XFMR (2)	0.21	0.542	-0.605	0.812	0.553	-0.619	0.830	0.524	0.470	0.704	0.243	0.787	0.823
T-TR-MCC B1-PNL XFMR	0.48	6.025	-8.633	10.528	6.456	-6.124	8.899	7.585	5.554	9.401	-10.417	-3.273	10.919
T-TR-MCC B1-PNL XFMR2	0.21	0.902	-1.506	1.756	0.925	-1.547	1.802	1.307	0.785	1.524	0.836	1.576	1.784
T-TR-MCC B2-PNL (2)	0.21	1.007	-1.660	1.942	1.033	-1.716	2.003	1.438	0.872	1.682	0.909	1.760	1.980
T-TR-MCC B2-PNL LB1 (2)	0.21	1.027	-1.627	1.924	1.047	-1.692	1.990	1.409	0.890	1.666	0.875	1.770	1.975
T-TR-MCC D1-PNL LD 2	0.48	4.527	-4.531	6.405	3.837	-2.692	4.688	3.922	3.929	5.552	-5.507	-3.030	6.286
T-TR-MCC D1-PNL LD2 (2)	0.21	0.958	-1.514	1.792	0.983	-1.585	1.865	1.311	0.830	1.552	0.807	1.661	1.847
T-TR-MCCB2-PNL LB1	0.48	5.917	-5.544	8.109	5.215	-3.140	6.087	4.798	5.140	7.031	-6.973	-4.162	8.121
T-TR-MCCB2-PNL XFMR	0.48	5.617	-7.334	9.238	5.689	-4.997	7.571	6.354	4.884	8.014	-8.953	-3.136	9.487
T-TR-MCCB4-PNL LP2	0.48	5.693	-8.452	10.191	6.220	-6.224	8.799	7.326	4.954	8.844	-10.333	-2.677	10.674
T-TR-MCCB4-PNL LP2 (2)	0.21	0.552	-0.629	0.837	0.559	-0.636	0.847	0.545	0.478	0.725	-0.828	-0.156	0.843
T-TR-MCCD1-PNL LD	0.48	4.324	-3.528	5.581	3.386	-1.919	3.892	3.052	3.752	4.837	-4.395	-3.137	5.400
T-TR-MCCDW1-PNL LDW	0.48	5.600	-4.645	7.276	4.673	-2.487	5.293	4.019	4.861	6.307	-5.916	-4.107	7.202
T-TR-MCCHW1-PNL LHW	0.48	5.596	-8.396	10.090	5.945	-6.055	8.486	7.277	4.868	8.755	-10.090	-2.660	10.434

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1.5-4 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
T-TR-SUB1/2-PNL L1 XFMR	0.48	4.688	-9.666	10.743	5.327	-7.868	9.502	8.380	4.079	9.320	-11.090	-0.884	11.125
T-TR-SUB1/2-PNL L1 XFMR 2	0.21	2.016	-3.515	4.052	2.148	-3.709	4.286	3.045	1.747	3.510	-4.192	0.215	4.197
T-TR-SUB2-PNL CP XFMR	0.48	2.027	-0.575	2.107	1.243	-0.250	1.268	0.497	1.755	1.824	-0.944	-1.681	1.928
T-TR-SUB2-PNL CP XFMR 2	0.21	0.866	-0.985	1.311	0.878	-1.111	1.416	0.853	0.750	1.135	0.415	1.380	1.441
T-TR-T7A-PRI	4.16	3.409	-7.697	8.418	3.199	-4.585	5.591	6.751	3.062	7.413	-8.022	-1.483	8.158
T-TR-T7A-SEC	0.48	2.888	-11.835	12.182	3.053	-12.575	12.940	10.570	2.714	10.913	9.105	8.922	12.748
T-TR-T8A-PRI	4.16	3.409	-7.697	8.418	3.199	-4.585	5.591	6.751	3.062	7.413	-8.022	-1.484	8.158
T-TR-T8A-SEC	0.48	2.889	-11.834	12.181	3.054	-12.572	12.938	10.566	2.716	10.910	9.103	8.924	12.747
THICK WAS 3 AFD	0.48	3.982	-11.619	12.283	4.855	-11.012	12.034	10.437	3.760	11.094	-12.743	1.195	12.799
THICK WAS 4 AFD	0.48	3.982	-11.619	12.283	4.855	-11.012	12.034	10.437	3.760	11.094	-12.743	1.195	12.799
VALVE OPERATOR	0.48	4.563	-2.042	4.999	3.084	-0.849	3.199	1.717	4.002	4.355	-2.857	-3.742	4.708
WATER HEATER	0.48	5.404	-8.130	9.762	5.870	-6.055	8.433	7.045	4.701	8.469	-9.888	-2.451	10.187

All fault currents are symmetrical momentary (1.5-4 Cycle network) values in rms kA

\* LLG fault current is the larger of the two faulted line currents

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**Short-Circuit Summary Report**

Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
54" METER VAULT VALVE	0.480	0.29353	0.03745	0.29590	0.29356	0.03733	0.29592	0.91560	0.06113	0.91764
A/C ROOF UNIT #2	0.480	0.04456	0.02719	0.05220	0.04459	0.02707	0.05216	0.13143	0.03594	0.13625
ABFV-1	0.480	0.05178	0.03470	0.06234	0.05190	0.03291	0.06146	0.15291	0.05504	0.16251
ABFV-2	0.480	0.06178	0.03504	0.07103	0.06190	0.03325	0.07027	0.18441	0.05588	0.19269
ABFV-3	0.480	0.07178	0.03538	0.08003	0.07190	0.03359	0.07936	0.21591	0.05671	0.22323
ABFV-4	0.480	0.08178	0.03572	0.08925	0.08190	0.03393	0.08865	0.24741	0.05755	0.25401
ABFV-5	0.480	0.09178	0.03606	0.09861	0.09190	0.03427	0.09808	0.27891	0.05838	0.28495
ABW #1 EFF. WEIR GATE	0.480	0.29353	0.03745	0.29590	0.29356	0.03733	0.29592	0.91560	0.06113	0.91764
ABW #1 FESTON SYSTEM	0.480	0.11823	0.03705	0.12389	0.11826	0.03693	0.12389	0.36341	0.06014	0.36835
ABW #1 INF. WEIR GATE	0.480	0.28153	0.03682	0.28392	0.28156	0.03670	0.28394	0.87780	0.05958	0.87982
ABW #1 SLUICE GATE #1	0.480	0.46536	0.03771	0.46689	0.46539	0.03759	0.46690	1.45695	0.06182	1.45826
ABW #3 FESTON SYSTEM	0.480	0.12296	0.03743	0.12853	0.12299	0.03731	0.12852	0.37839	0.06113	0.38329
ABW #3,4,5 FESTON SYSTEM	0.480	0.20816	0.03897	0.21178	0.20819	0.03885	0.21178	0.64677	0.06492	0.65002
ABW 3,4,5 FLOCCULATOR	0.480	0.48536	0.03839	0.48688	0.48539	0.03827	0.48689	1.51995	0.06349	1.52127
ABW #3,4,6 FESTON SYSTEM	0.480	0.20053	0.03858	0.20420	0.20056	0.03846	0.20421	0.62265	0.06391	0.62592
ABW #3,4,6 SLUICE GATE	0.480	0.31753	0.03871	0.31988	0.31756	0.03859	0.31990	0.99120	0.06423	0.99328
ABW #5 SLUICE GATE	0.480	0.29353	0.03745	0.29590	0.29356	0.03733	0.29592	0.91560	0.06113	0.91764
ABW #6 FESTON SYSTEM	0.480	0.12313	0.03769	0.12876	0.12316	0.03757	0.12876	0.37884	0.06172	0.38384
ABW #6 SLUICE GATE	0.480	0.30553	0.03808	0.30789	0.30556	0.03796	0.30791	0.95340	0.06268	0.95546
ABW 6,7 FLASH MIXER #3	0.480	0.34136	0.03971	0.34366	0.34139	0.03959	0.34368	1.06635	0.06674	1.06843
ABW #7 FESTON SYSTEM	0.480	0.13766	0.03935	0.14318	0.13769	0.03923	0.14317	0.42469	0.06585	0.42977
ABW FILTER #2	0.480	0.12786	0.03807	0.13341	0.12789	0.03795	0.13340	0.39382	0.06270	0.39878
ABW SLUICE GATE	0.480	0.48536	0.03839	0.48688	0.48539	0.03827	0.48689	1.51995	0.06349	1.52127
ACU-1	0.480	0.02798	0.03488	0.04472	0.02810	0.03309	0.04341	0.07794	0.05548	0.09567
AFD-MCC D1-THICKENER	0.480	0.03108	0.02967	0.04297	0.03111	0.02952	0.04289	0.08557	0.03846	0.09382
AIR COMPRESSOR	0.480	0.02286	0.02224	0.03189	0.02290	0.02026	0.03057	0.06219	0.02470	0.06692
AIR COMPRESSOR 2	0.480	0.02481	0.02240	0.03343	0.02485	0.02042	0.03216	0.06833	0.02510	0.07280
BASIN 1 ADFV 13	0.480	0.09544	0.02647	0.09904	0.09546	0.02632	0.09902	0.28918	0.03150	0.29089
BASIN 2 ADFV 14	0.480	0.11944	0.02773	0.12262	0.11946	0.02758	0.12260	0.36478	0.03460	0.36642
BASIN 3 ADFV 15	0.480	0.15244	0.02946	0.15526	0.15246	0.02931	0.15525	0.46873	0.03886	0.47034
BASIN 4 ADFV 16	0.480	0.18544	0.03119	0.18805	0.18546	0.03105	0.18804	0.57268	0.04312	0.57430
BELT FILTER PRESS 1	0.480	0.03776	0.02652	0.04615	0.03779	0.02638	0.04609	0.10662	0.03072	0.11096
BELT FILTER PRESS 2	0.480	0.03777	0.02653	0.04615	0.03778	0.02638	0.04608	0.10662	0.03072	0.11096
BELT FILTER PRESS 3	0.480	0.03042	0.02557	0.03973	0.03043	0.02543	0.03966	0.08347	0.02836	0.08815
BELT FILTER PRESS 4	0.480	0.03041	0.02556	0.03973	0.03044	0.02542	0.03966	0.08347	0.02836	0.08815

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Bus ID	kV	Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
		Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
BELT FILTER PRESS 5	0.480	0.02306	0.02460	0.03372	0.02309	0.02446	0.03364	0.06032	0.02600	0.06568
BELT FILTER PRESS 6	0.480	0.02307	0.02460	0.03372	0.02309	0.02446	0.03364	0.06032	0.02600	0.06568
BLOWER #6 INLET VALVE	0.480	0.02215	0.03369	0.04032	0.02226	0.03191	0.03891	0.05956	0.05256	0.07943
BLOWER A LS	4.160	0.09356	0.24578	0.26298	0.09326	0.23428	0.25216	0.45869	0.50147	0.67961
BLOWER B LS	4.160	0.09280	0.24536	0.26233	0.09092	0.23078	0.24804	0.46594	0.50881	0.68992
BLOWER BUS A	4.160	0.09356	0.24578	0.26298	0.09326	0.23428	0.25216	0.45869	0.50147	0.67961
BLOWER BUS B	4.160	0.09280	0.24536	0.26233	0.09092	0.23078	0.24804	0.46594	0.50881	0.68992
CLARIFIER 1 CP	0.480	0.18216	0.03947	0.18639	0.18220	0.03935	0.18640	0.56482	0.06610	0.56867
CLARIFIER 2 CP	0.480	0.18056	0.03905	0.18474	0.18059	0.03893	0.18474	0.55983	0.06511	0.56360
CLARIFIER 5 CP	0.480	0.18243	0.03973	0.18671	0.18247	0.03961	0.18672	0.56567	0.06674	0.56959
CONVEYOR CP	0.480	0.05272	0.02627	0.05890	0.05273	0.02613	0.05885	0.15371	0.03008	0.15663
D-DP1-RAS PUMP 7	0.480	0.02993	0.03391	0.04523	0.02997	0.03378	0.04516	0.08529	0.05242	0.10011
D-DP1-RAS PUMP 8	0.480	0.02993	0.03391	0.04523	0.02997	0.03378	0.04516	0.08529	0.05242	0.10011
D-DP1-WAS 5	0.480	0.03443	0.03159	0.04673	0.03447	0.03147	0.04667	0.09947	0.04671	0.10989
D-DP1-WAS 6	0.480	0.03443	0.03159	0.04673	0.03447	0.03147	0.04667	0.09947	0.04671	0.10989
D-DP2-RAS PUMP 1	0.480	0.03896	0.03545	0.05268	0.03900	0.03532	0.05261	0.11374	0.05621	0.12687
D-DP2-RAS PUMP 3	0.480	0.03896	0.03545	0.05268	0.03900	0.03532	0.05261	0.11374	0.05621	0.12687
D-DP2-WAS 1	0.480	0.03416	0.03133	0.04635	0.03420	0.03121	0.04630	0.09862	0.04607	0.10885
D-DP2-WAS 2	0.480	0.03416	0.03133	0.04635	0.03420	0.03121	0.04630	0.09862	0.04607	0.10885
D-DP4-RAS PUMP 2	0.480	0.02496	0.03263	0.04108	0.02499	0.03251	0.04100	0.06969	0.04932	0.08537
D-DP4-WAS 2	0.480	0.03256	0.03091	0.04490	0.03259	0.03079	0.04483	0.09363	0.04509	0.10392
D-DP4-WAS PUMP 2	0.480	0.09256	0.03295	0.09825	0.09259	0.03283	0.09823	0.28263	0.05011	0.28703
D-MCC 1-EXHAUST 1	0.480	0.09178	0.03606	0.09861	0.09190	0.03427	0.09808	0.27891	0.05838	0.28495
D-MCC 1-EXHAUST 2	0.480	0.09178	0.03606	0.09861	0.09190	0.03427	0.09808	0.27891	0.05838	0.28495
D-MCC 1-EXHAUST 3	0.480	0.09178	0.03606	0.09861	0.09190	0.03427	0.09808	0.27891	0.05838	0.28495
D-MCC 1-EXHAUST 4	0.480	0.09178	0.03606	0.09861	0.09190	0.03427	0.09808	0.27891	0.05838	0.28495
D-MCC B1-AIR BLOWER	0.480	0.01303	0.02305	0.02647	0.01275	0.02095	0.02452	0.03211	0.02671	0.04177
D-MCC B1-DAF THICK 2	0.480	0.09031	0.02366	0.09336	0.09035	0.02168	0.09291	0.27466	0.02821	0.27610
D-MCC B1-EAST DAF RECYC	0.480	0.01399	0.02333	0.02721	0.01366	0.02122	0.02524	0.03526	0.02741	0.04466
D-MCC B1-PRESSURIZATION	0.480	0.02081	0.02537	0.03281	0.02027	0.02321	0.03082	0.05731	0.03232	0.06579
D-MCC B1-THICK WAS 3	0.480	0.01931	0.02476	0.03140	0.01935	0.02278	0.02989	0.05101	0.03092	0.05965
D-MCC B1-THICK WAS 4	0.480	0.01931	0.02476	0.03140	0.01935	0.02278	0.02989	0.05101	0.03092	0.05965
D-MCC B1-WEST DAF RECYC	0.480	0.01399	0.02333	0.02721	0.01366	0.02122	0.02524	0.03526	0.02741	0.04466
D-MCC B2-AIR COMPRESSOR	0.480	0.03484	0.02558	0.04322	0.03486	0.02543	0.04315	0.09829	0.02932	0.10257
D-MCC B2-EQ DIVERSION VLV	0.480	0.09544	0.02480	0.09861	0.09546	0.02465	0.09859	0.28918	0.02740	0.29047
D-MCC B2-RETURN SLUDGE	0.480	0.06004	0.02629	0.06554	0.06004	0.02613	0.06548	0.17767	0.03107	0.18036



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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
D-MCC B2-RETURN SLUDGE 2	0.480	0.04444	0.02499	0.05098	0.04445	0.02483	0.05092	0.12853	0.02787	0.13152
D-MCC B2-RETURN SLUDGE 3	0.480	0.05224	0.02564	0.05819	0.05225	0.02548	0.05813	0.15310	0.02947	0.15591
D-MCC B2-RETURN SLUDGE 4	0.480	0.05224	0.02564	0.05819	0.05225	0.02548	0.05813	0.15310	0.02947	0.15591
D-MCC B2-RETURN SLUDGE 5	0.480	0.06004	0.02629	0.06554	0.06004	0.02613	0.06548	0.17767	0.03107	0.18036
D-MCC B3-STANDBY PRESSURE	0.480	0.01724	0.02455	0.03000	0.01692	0.02256	0.02820	0.04532	0.03013	0.05442
D-MCC D1-BFP FEED PUMP	0.480	0.07108	0.03214	0.07801	0.07110	0.03199	0.07797	0.21157	0.04453	0.21621
D-MCC D1-BFP FEED PUMP5	0.480	0.06568	0.03354	0.07375	0.06571	0.03339	0.07370	0.19456	0.04798	0.20039
D-MCC D1-GRAVITY THICK	0.480	0.15108	0.03375	0.15480	0.15111	0.03360	0.15480	0.46357	0.04850	0.46610
D-MCC D1-SLUDGE RECIRC 1	0.480	0.03558	0.03219	0.04798	0.03561	0.03204	0.04790	0.09975	0.04466	0.10929
D-MCC D1-SLUDGE RECIRC 3	0.480	0.04048	0.03283	0.05212	0.04051	0.03268	0.05205	0.11518	0.04623	0.12411
D-MCC D1-SLUDGE RECIRC 4	0.480	0.04538	0.03347	0.05639	0.04541	0.03332	0.05632	0.13062	0.04781	0.13909
D-MCC D1-SLUDGE TRANSFER1	0.480	0.03068	0.03155	0.04401	0.03071	0.03140	0.04392	0.08431	0.04308	0.09468
D-MCC D1-THICKENER	0.480	0.15108	0.03375	0.15480	0.15110	0.03360	0.15479	0.46357	0.04850	0.46610
D-MCC D2-BFP FEED PUMP1	0.480	0.05318	0.03132	0.06172	0.05320	0.03117	0.06166	0.15518	0.04252	0.16090
D-MCC D2-BFP FEED PUMP4	0.480	0.07718	0.03258	0.08377	0.07719	0.03243	0.08373	0.23078	0.04562	0.23524
D-MCC D2-BFP FEED PUMP6	0.480	0.08918	0.03321	0.09516	0.08919	0.03306	0.09512	0.26858	0.04717	0.27269
D-MCC D2-SLUDGE RECIRC 2	0.480	0.05408	0.03269	0.06319	0.05410	0.03254	0.06313	0.15801	0.04589	0.16454
D-MCC D2-SLUDGE TRANSFER2	0.480	0.14317	0.03606	0.14764	0.14315	0.03588	0.14758	0.43868	0.05414	0.44201
D-MCC D2-SLUDGE TRANSFER3	0.480	0.06188	0.03334	0.07029	0.06189	0.03319	0.07023	0.18258	0.04749	0.18866
D-MCC D2-SLUDGE TRANSFER4	0.480	0.03058	0.03061	0.04327	0.03061	0.03046	0.04319	0.08400	0.04078	0.09337
D-MCC DW1-PLANT DRAIN1	0.480	0.12390	0.03266	0.12814	0.12389	0.03248	0.12808	0.37799	0.04580	0.38076
D-MCC DW1-PLANT DRAIN2	0.480	0.12390	0.03266	0.12814	0.12389	0.03248	0.12808	0.37799	0.04580	0.38076
D-MCC DW1-PLANT DRAIN3	0.480	0.12390	0.03266	0.12814	0.12389	0.03248	0.12808	0.37799	0.04580	0.38076
D-MCC E1-EF-7	0.480	0.10152	0.02737	0.10515	0.10156	0.02725	0.10515	0.31080	0.03633	0.31292
D-MCC E1-FLASH MIXER 1	0.480	0.54545	0.04082	0.54698	0.54517	0.04052	0.54668	1.70940	0.06910	1.71080
D-MCC E1-FLASH MIXER 2	0.480	0.31750	0.03875	0.31985	0.31743	0.03856	0.31976	0.99120	0.06423	0.99328
D-MCC E2-EF-5.1	0.480	0.16536	0.02751	0.16763	0.16539	0.02739	0.16764	0.51195	0.03672	0.51326
D-MCC E2-EF-5.2	0.480	0.16536	0.02751	0.16763	0.16539	0.02739	0.16764	0.51195	0.03672	0.51326
D-MCC HW1-CONVEYOR EAST	0.480	0.06492	0.02440	0.06935	0.06494	0.02427	0.06933	0.19466	0.02814	0.19669
D-MCC HW1-FINAL CLAR. 3	0.480	1.04338	0.04573	1.04438	1.04338	0.04557	1.04438	3.27694	0.08055	3.27793
D-MCC HW1-FINAL CLAR. 4	0.480	1.02788	0.04536	1.02888	1.02788	0.04521	1.02888	3.22811	0.07965	3.22909
D-MCC HW1-GRIT CLASS WEST	0.480	0.22491	0.02873	0.22674	0.22494	0.02860	0.22675	0.69866	0.03879	0.69974
D-MCC HW1-PRI. SLUDGE	0.480	0.72490	0.04574	0.72634	0.72491	0.04560	0.72635	2.27366	0.08061	2.27509

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
D-MCC HW1-RSP 4	0.480	0.05691	0.03607	0.06738	0.05692	0.03592	0.06731	0.16946	0.05685	0.17874
D-MCC HW1-RSP 5	0.480	0.05691	0.03607	0.06738	0.05692	0.03592	0.06731	0.16946	0.05685	0.17874
D-MCC HW1-WEST CONVEYOR	0.480	0.23491	0.02907	0.23670	0.23493	0.02894	0.23670	0.73016	0.03963	0.73124
D-MCC HW2-GRIT CLASS 2	0.480	0.14521	0.02649	0.14760	0.14522	0.02635	0.14760	0.44758	0.03328	0.44881
D-MCC HW2-GRIT PUMP 2	0.480	0.07720	0.02551	0.08131	0.07721	0.02536	0.08127	0.23338	0.03087	0.23541
D-MCC HW2-PRI. SLUDGE 1	0.480	0.52520	0.03941	0.52668	0.52521	0.03927	0.52668	1.64458	0.06506	1.64586
D-MCC HW2-PRI. SLUDGE 3	0.480	0.52520	0.03941	0.52668	0.52521	0.03927	0.52668	1.64458	0.06506	1.64586
D-MCC HW2-RSP 6	0.480	0.05720	0.03655	0.06788	0.05721	0.03639	0.06780	0.17038	0.05803	0.17999
D-MCC HW2-WAS PUMP 3	0.480	0.32919	0.03876	0.33146	0.32917	0.03859	0.33143	1.02718	0.06342	1.02913
D-MCC HW2-WAS PUMP 4	0.480	0.32919	0.03876	0.33146	0.32917	0.03859	0.33143	1.02718	0.06342	1.02913
D-MCCB4-SUBM PUMP START	0.480	0.12244	0.03150	0.12642	0.12244	0.03134	0.12639	0.37423	0.04386	0.37679
DAF THICKENER 2 AFD	0.480	0.03031	0.02162	0.03724	0.03035	0.01964	0.03615	0.08566	0.02319	0.08874
DAVIS SCRUBBER	0.480	0.02121	0.02629	0.03378	0.02123	0.02615	0.03368	0.05698	0.03279	0.06574
DEEP WELL PUMP 1 VFD	0.480	0.00422	0.01933	0.01979	0.00405	0.01788	0.01833	0.00561	0.01957	0.02036
DEEP WELL PUMP 2 VFD	0.480	0.00446	0.01910	0.01961	0.00417	0.01671	0.01722	0.00746	0.02142	0.02268
DEEP WELL PUMP 3 VFD	0.480	0.00377	0.01819	0.01858	0.00356	0.01592	0.01632	0.00500	0.01896	0.01961
DEEP WELL PUMP 4 VFD	0.480	0.00573	0.02078	0.02155	0.00536	0.01912	0.01986	0.00961	0.02377	0.02564
DEEP WELL PUMP 5 VFD	0.480	0.00547	0.01997	0.02070	0.00492	0.01731	0.01800	0.01031	0.02440	0.02649
DEEP WELL PUMP 6 VFD	0.480	0.00522	0.01963	0.02031	0.00470	0.01702	0.01766	0.00938	0.02348	0.02528
DEGRITTER CP	0.480	0.08921	0.02614	0.09296	0.08922	0.02600	0.09294	0.27118	0.03242	0.27311
DP1 MAIN LS	0.480	0.01443	0.03091	0.03411	0.01447	0.03079	0.03402	0.03647	0.04504	0.05795
DP2 MAIN LS	0.480	0.01416	0.03065	0.03376	0.01420	0.03053	0.03367	0.03562	0.04440	0.05692
DP4 MAIN LS	0.480	0.01256	0.03023	0.03274	0.01259	0.03011	0.03264	0.03063	0.04342	0.05313
EFF. FILTER PS CNTRL	0.480	0.01481	0.02972	0.03321	0.01484	0.02960	0.03311	0.03771	0.04216	0.05657
ELECTRIC ROLL-UP DOOR	0.480	0.07178	0.03538	0.08003	0.07190	0.03359	0.07936	0.21591	0.05671	0.22323
EQ TANK RETURN	0.480	0.10544	0.02514	0.10840	0.10546	0.02500	0.10838	0.32068	0.02824	0.32192
FPL PRIMARY	23.000	1.18829	10.05396	10.12393	1.24073	9.79115	9.86944			
FPL SERVICE	4.160	0.01151	0.13469	0.13518	0.01323	0.12609	0.12679	0.00391	0.04097	0.04116
HOIST	0.480	0.03244	0.02316	0.03986	0.03246	0.02301	0.03979	0.09073	0.02336	0.09369
LIGHTING PANEL	0.208	0.04684	0.05964	0.07583	0.04685	0.05927	0.07555	0.06917	0.05701	0.08963
LTG. PNL	0.208	0.03407	0.05345	0.06338	0.03407	0.05342	0.06336	0.03494	0.04981	0.06084
MAIN GATE CP	0.480	0.36492	0.04015	0.36712	0.36494	0.04002	0.36713	1.13966	0.06688	1.14162
MCC 1	0.480	0.02178	0.03368	0.04011	0.02190	0.03189	0.03869	0.05841	0.05253	0.07856
MCC B1	0.480	0.00531	0.02077	0.02144	0.00535	0.01879	0.01954	0.00691	0.02110	0.02221
MCC B2	0.480	0.00544	0.02174	0.02241	0.00546	0.02159	0.02227	0.00568	0.01987	0.02067
MCC B3	0.480	0.00560	0.02112	0.02185	0.00569	0.01929	0.02011	0.00752	0.02172	0.02298

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
MCC B4	0.480	0.00544	0.02174	0.02241	0.00546	0.02160	0.02227	0.00568	0.01987	0.02067
MCC D1	0.480	0.01108	0.02899	0.03103	0.01111	0.02884	0.03091	0.02257	0.03679	0.04316
MCC D2	0.480	0.01118	0.02911	0.03119	0.01120	0.02897	0.03106	0.02288	0.03709	0.04358
MCC D4 LS	0.480	0.00642	0.02344	0.02431	0.00649	0.02161	0.02257	0.00790	0.02352	0.02481
MCC D5 LS	0.480	0.00642	0.02344	0.02431	0.00650	0.02162	0.02258	0.00790	0.02352	0.02481
MCC DW1	0.480	0.00592	0.02236	0.02313	0.00594	0.02222	0.02300	0.00629	0.02049	0.02143
MCC DW2	0.480	0.00592	0.02237	0.02313	0.00593	0.02223	0.02300	0.00629	0.02049	0.02143
MCC E1	0.480	0.00553	0.02233	0.02300	0.00556	0.02221	0.02290	0.00840	0.02393	0.02536
MCC E2	0.480	0.00536	0.02207	0.02271	0.00539	0.02195	0.02261	0.00795	0.02334	0.02466
MCC HW 1	0.480	0.00492	0.02125	0.02181	0.00494	0.02112	0.02169	0.00566	0.02039	0.02116
MCC HW 2	0.480	0.00521	0.02173	0.02234	0.00523	0.02159	0.02221	0.00658	0.02157	0.02255
MCC-D4	0.480	0.00642	0.02344	0.02431	0.00649	0.02161	0.02257	0.00790	0.02352	0.02481
MCC-D5	0.480	0.00642	0.02344	0.02431	0.00650	0.02162	0.02258	0.00790	0.02352	0.02481
MCC1 LS	0.480	0.02178	0.03368	0.04011	0.02190	0.03189	0.03869	0.05841	0.05253	0.07856
MCCB1 LS	0.480	0.00531	0.02077	0.02144	0.00535	0.01879	0.01954	0.00691	0.02110	0.02221
MCCD1 LS	0.480	0.01108	0.02899	0.03103	0.01111	0.02884	0.03091	0.02257	0.03679	0.04316
MCCD2 LS	0.480	0.01118	0.02911	0.03119	0.01120	0.02897	0.03106	0.02288	0.03709	0.04358
MECH SCREEN CP	0.480	0.10491	0.02465	0.10777	0.10494	0.02452	0.10776	0.32066	0.02875	0.32195
MOV RATE OF FLOW	0.480	0.31736	0.03845	0.31968	0.31739	0.03833	0.31969	0.99075	0.06364	0.99279
MTS-AC1-LOAD	0.480	0.15642	0.02855	0.15900	0.15648	0.02671	0.15874	0.48040	0.03607	0.48176
MTS-MCC D4 LINE	0.480	0.15642	0.02855	0.15900	0.15648	0.02671	0.15874	0.48040	0.03607	0.48176
MTS-MCC D5-LINE	0.480	0.15642	0.02854	0.15901	0.15650	0.02672	0.15877	0.48040	0.03607	0.48176
NEW MAINT. BLDG	0.480	0.01864	0.03436	0.03909	0.01866	0.03422	0.03898	0.04636	0.05001	0.06819
OLD MAINTENANCE BLDG	0.480	0.04792	0.03434	0.05895	0.04793	0.03420	0.05888	0.13859	0.04993	0.14731
PLANT DRAIN #3	0.480	0.00692	0.02290	0.02392	0.00694	0.02276	0.02380	0.00944	0.02182	0.02377
PLANT DRAIN PS CTL PNL	0.480	0.01796	0.03227	0.03693	0.01799	0.03215	0.03684	0.04764	0.04843	0.06793
PMS-7A LS	4.160	0.10607	0.25553	0.27667	0.10696	0.24500	0.26733	0.49043	0.53206	0.72361
PMS-8A LS	4.160	0.10607	0.25552	0.27666	0.10697	0.24497	0.26731	0.49043	0.53206	0.72361
PNL CP	0.208	0.06448	0.06994	0.09513	0.06449	0.06992	0.09512	0.04932	0.06486	0.08148
PNL DP #1	0.480	0.01443	0.03091	0.03411	0.01447	0.03079	0.03402	0.03647	0.04504	0.05795
PNL DP #2	0.480	0.01416	0.03065	0.03376	0.01420	0.03053	0.03367	0.03562	0.04440	0.05692
PNL DP #4	0.480	0.01256	0.03023	0.03274	0.01259	0.03011	0.03264	0.03063	0.04342	0.05313
PNL L1	0.208	0.02825	0.03871	0.04792	0.02825	0.03868	0.04790	0.05516	0.05333	0.07672
PNL LB1	0.208	0.03533	0.05336	0.06399	0.03533	0.05333	0.06397	0.03494	0.04981	0.06084
PNL LC1/LC2	0.208	0.03897	0.05409	0.06666	0.03897	0.05406	0.06664	0.05038	0.05138	0.07196
PNL LD	0.208	0.04054	0.06079	0.07307	0.04054	0.06076	0.07305	0.03546	0.05531	0.06570
PNL LD 2	0.208	0.03785	0.05720	0.06859	0.03786	0.05718	0.06857	0.03641	0.05229	0.06372

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
PNL LDW	0.208	0.03735	0.05698	0.06813	0.03735	0.05695	0.06811	0.03399	0.05283	0.06282
PNL LHW	0.208	0.03250	0.05298	0.06216	0.03251	0.05295	0.06214	0.03179	0.04911	0.05850
PNL LP1	0.208	0.10176	0.11075	0.15040	0.10178	0.11041	0.15017	0.10151	0.10515	0.14616
PNL LP2	0.208	0.09950	0.10855	0.14726	0.09951	0.10852	0.14724	0.10718	0.10525	0.15022
PNL P3	0.480	0.01044	0.02317	0.02541	0.01046	0.02302	0.02528	0.02143	0.02338	0.03171
PNL PC/TC-2	0.208	0.03495	0.05330	0.06374	0.03496	0.05327	0.06372	0.03951	0.04989	0.06364
PNL PC/TC-3	0.208	0.04023	0.05400	0.06734	0.04023	0.05397	0.06732	0.05038	0.05138	0.07196
PNL PC/TC-4	0.208	0.04225	0.05762	0.07145	0.04225	0.05759	0.07143	0.04943	0.05440	0.07351
PNL XLC	0.208	0.10851	0.18092	0.21097	0.10852	0.18090	0.21095	0.10355	0.17500	0.20334
PNL XLC (2)	0.208	0.10816	0.18079	0.21068	0.10817	0.18077	0.21066	0.10355	0.17500	0.20334
PNL-P1	0.480	0.04006	0.03641	0.05413	0.04008	0.03629	0.05407	0.11724	0.05862	0.13107
PNL-P4	0.480	0.02436	0.02748	0.03673	0.02439	0.02737	0.03666	0.06780	0.03666	0.07707
POLYMER FEED 5, 6	0.480	0.10192	0.02741	0.10554	0.10193	0.02727	0.10552	0.30869	0.03289	0.31044
POLYMER FEED CP	0.480	0.11391	0.02804	0.11731	0.11393	0.02789	0.11730	0.34649	0.03444	0.34820
POLYMER MIX CP	0.480	0.11391	0.02803	0.11731	0.11394	0.02789	0.11730	0.34649	0.03444	0.34820
RAS 1 VFD	0.480	0.01726	0.03125	0.03570	0.01730	0.03113	0.03561	0.04538	0.04588	0.06453
RAS 2 VFD	0.480	0.01566	0.03083	0.03458	0.01569	0.03071	0.03449	0.04039	0.04489	0.06039
RAS 3 VFD	0.480	0.01726	0.03125	0.03570	0.01730	0.03113	0.03561	0.04538	0.04588	0.06453
RAS 7 VFD	0.480	0.01753	0.03151	0.03606	0.01757	0.03139	0.03597	0.04623	0.04652	0.06558
RAS 8 VFD	0.480	0.01753	0.03151	0.03606	0.01757	0.03139	0.03597	0.04623	0.04652	0.06558
REUSE LIFT STATION PUMP	0.480	0.16553	0.02777	0.16784	0.16556	0.02765	0.16785	0.51240	0.03731	0.51376
ROOF A/C #1	0.480	0.19273	0.03793	0.19642	0.19276	0.03781	0.19643	0.59808	0.06231	0.60132
S-DEEP WELL 2 LOAD	0.480	0.00377	0.01819	0.01858	0.00356	0.01592	0.01632	0.00500	0.01896	0.01961
S-DEEP WELL 5 LOAD	0.480	0.00505	0.01940	0.02005	0.00455	0.01683	0.01743	0.00877	0.02286	0.02449
S-MCC D1-PNL LD	0.480	0.03448	0.03094	0.04633	0.03451	0.03079	0.04625	0.09628	0.04158	0.10488
S-MCC D2-PNL LD	0.480	0.03458	0.03106	0.04648	0.03460	0.03092	0.04641	0.09659	0.04189	0.10528
S-MCC DW1-PNL LDW	0.480	0.02542	0.02399	0.03495	0.02544	0.02385	0.03487	0.06772	0.02449	0.07201
S-MCC DW2-PNL LDW	0.480	0.02542	0.02399	0.03495	0.02543	0.02385	0.03487	0.06772	0.02449	0.07201
S-MCC HW1-PNL LHW	0.480	0.01467	0.02206	0.02649	0.01469	0.02193	0.02640	0.03638	0.02239	0.04271
S-MCC HW2-PNL LHW	0.480	0.01133	0.02253	0.02522	0.01135	0.02239	0.02510	0.02587	0.02354	0.03498
S-MCCB2-PNL LB1	0.480	0.01714	0.02272	0.02846	0.01716	0.02257	0.02835	0.04253	0.02227	0.04801
S-MCCB2-PNL P3	0.480	0.00844	0.02260	0.02412	0.00846	0.02245	0.02399	0.01513	0.02198	0.02668
S-MCCB3-PNL LB1	0.480	0.01730	0.02210	0.02806	0.01739	0.02026	0.02670	0.04438	0.02412	0.05051
S-MCCB3-PNL P3	0.480	0.00860	0.02198	0.02360	0.00869	0.02014	0.02194	0.01697	0.02382	0.02925
S-MCCE1-PNL P4	0.480	0.02753	0.02860	0.03969	0.02756	0.02848	0.03963	0.07770	0.03936	0.08710
S-MCCE2-PNL P4	0.480	0.02136	0.02663	0.03414	0.02139	0.02651	0.03407	0.05835	0.03456	0.06781
S-PNL L1-LOAD	0.480	0.01006	0.02266	0.02479	0.01008	0.02254	0.02470	0.02274	0.02479	0.03364

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
S-PNL LB1-LOAD	0.480	0.01714	0.02272	0.02846	0.01716	0.02257	0.02835	0.04253	0.02227	0.04801
S-PNL LD LOAD	0.480	0.03458	0.03106	0.04648	0.03460	0.03092	0.04641	0.09659	0.04189	0.10528
S-PNL LDW LOAD	0.480	0.02542	0.02399	0.03495	0.02543	0.02385	0.03487	0.06772	0.02449	0.07201
S-PNL LHW LOAD	0.480	0.01133	0.02253	0.02522	0.01135	0.02239	0.02510	0.02587	0.02354	0.03498
S-PNL P1-LOAD	0.480	0.01006	0.02266	0.02479	0.01008	0.02254	0.02470	0.02274	0.02479	0.03364
S-PNL P3-LOAD	0.480	0.00844	0.02260	0.02412	0.00846	0.02245	0.02399	0.01513	0.02198	0.02668
S-PNL P4-LOAD	0.480	0.02136	0.02663	0.03414	0.02139	0.02651	0.03407	0.05835	0.03456	0.06781
S-SUB1-PNL L1	0.480	0.00768	0.02158	0.02291	0.00771	0.02147	0.02281	0.01518	0.02209	0.02680
S-SUB1-PNL P1	0.480	0.00768	0.02158	0.02291	0.00771	0.02147	0.02281	0.01518	0.02209	0.02680
S-SUB2-PNL L1	0.480	0.01006	0.02266	0.02479	0.01008	0.02254	0.02470	0.02274	0.02479	0.03364
S-SUB2-PNL P1	0.480	0.01006	0.02266	0.02479	0.01008	0.02254	0.02470	0.02274	0.02479	0.03364
S-SUB9-DEEP WELL 2	0.480	0.00449	0.01965	0.02016	0.00438	0.01830	0.01882	0.00623	0.02019	0.02113
S-SUB10-DEEP WELL 2	0.480	0.00377	0.01819	0.01858	0.00356	0.01592	0.01632	0.00500	0.01896	0.01961
S-SWBD11-DEEP WELL 5	0.480	0.00560	0.02059	0.02134	0.00530	0.01902	0.01975	0.00900	0.02316	0.02485
S-SWBD12-DEEP WELL 5	0.480	0.00505	0.01940	0.02005	0.00455	0.01683	0.01743	0.00877	0.02286	0.02449
SCUM EJECTOR CP	0.480	0.30488	0.03703	0.30712	0.30485	0.03685	0.30707	0.95066	0.05914	0.95250
SEC CLARIFIERS 3, 4	0.480	0.40121	0.04252	0.40346	0.40123	0.04238	0.40346	1.25398	0.07271	1.25608
SLUDGE THICKENER DRIVE	0.480	0.07144	0.02521	0.07576	0.07146	0.02506	0.07573	0.21358	0.02840	0.21546
SLUICE GATE 2	0.480	0.46536	0.03771	0.46689	0.46539	0.03759	0.46690	1.45695	0.06182	1.45826
SLUICE GATE #4	0.480	0.46553	0.03797	0.46707	0.46556	0.03785	0.46710	1.45740	0.06241	1.45874
SODIUM BICARBONATE CP	0.480	0.02308	0.03241	0.03979	0.02311	0.03226	0.03969	0.06037	0.04520	0.07542
SUB 1 BUS A	0.480	0.00408	0.01993	0.02034	0.00411	0.01982	0.02024	0.00384	0.01803	0.01843
SUB1 FEED	4.160	0.01802	0.14317	0.14430	0.01971	0.13453	0.13597	0.03827	0.07575	0.08487
SUB1 LS	0.480	0.00408	0.01993	0.02034	0.00411	0.01982	0.02024	0.00384	0.01803	0.01843
SUB1/SUB9	4.160	0.01201	0.13507	0.13560	0.01370	0.12644	0.12718	0.00565	0.04272	0.04310
SUB 2 BUS B	0.480	0.00406	0.01991	0.02032	0.00408	0.01979	0.02021	0.00384	0.01803	0.01843
SUB2 FEED	4.160	0.01669	0.14138	0.14236	0.01839	0.13275	0.13402	0.03102	0.06841	0.07512
SUB2 LS	0.480	0.00406	0.01991	0.02032	0.00408	0.01979	0.02021	0.00384	0.01803	0.01843
SUB2/SUB10	4.160	0.01202	0.13508	0.13561	0.01371	0.12645	0.12719	0.00565	0.04272	0.04310
SUB 3 BUS A	0.480	0.00434	0.02029	0.02074	0.00436	0.02016	0.02063	0.00384	0.01803	0.01843
SUB3 FEED	4.160	0.03764	0.16969	0.17382	0.03894	0.16033	0.16499	0.14700	0.18585	0.23696
SUB3 MAIN LS	0.480	0.00434	0.02029	0.02074	0.00436	0.02016	0.02063	0.00384	0.01803	0.01843
SUB 4 BUS B	0.480	0.00434	0.02029	0.02075	0.00435	0.02015	0.02062	0.00384	0.01803	0.01843
SUB4 FEED	4.160	0.03776	0.16987	0.17402	0.03870	0.15957	0.16420	0.15062	0.18952	0.24209
SUB4 MAIN LS	0.480	0.00434	0.02029	0.02075	0.00435	0.02015	0.02062	0.00384	0.01803	0.01843
SUB 5 BUS A	0.480	0.00486	0.02099	0.02155	0.00487	0.02085	0.02141	0.00384	0.01803	0.01843
SUB5 FEED	4.160	0.07674	0.22281	0.23565	0.07703	0.21203	0.22559	0.36446	0.40605	0.54563

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
SUB5 MAIN LS	0.480	0.00486	0.02099	0.02155	0.00487	0.02085	0.02141	0.00384	0.01803	0.01843
SUB 6 BUS B	0.480	0.00446	0.01966	0.02016	0.00457	0.01787	0.01845	0.00384	0.01803	0.01843
SUB6 FEED	4.160	0.07625	0.22260	0.23530	0.07522	0.20908	0.22219	0.37171	0.41339	0.55593
SUB6 MAIN LS	0.480	0.00446	0.01966	0.02016	0.00457	0.01787	0.01845	0.00384	0.01803	0.01843
SUB 7 BUS A	0.480	0.00514	0.02137	0.02197	0.00515	0.02123	0.02184	0.00384	0.01803	0.01843
SUB7 FEED	4.160	0.09764	0.25078	0.26912	0.09867	0.24036	0.25982	0.47681	0.51982	0.70538
SUB7 MAIN LS	0.480	0.00514	0.02137	0.02197	0.00515	0.02123	0.02184	0.00384	0.01803	0.01843
SUB7/SUB11	4.160	0.01202	0.13508	0.13561	0.01371	0.12645	0.12719	0.00565	0.04272	0.04310
SUB 8 BUS B	0.480	0.00514	0.02136	0.02197	0.00516	0.02122	0.02184	0.00384	0.01803	0.01843
SUB8 FEED	4.160	0.09763	0.25077	0.26910	0.09868	0.24034	0.25981	0.47681	0.51982	0.70538
SUB8 MAIN LS	0.480	0.00514	0.02136	0.02197	0.00516	0.02122	0.02184	0.00384	0.01803	0.01843
SUB8/SUB12	4.160	0.01201	0.13507	0.13560	0.01370	0.12644	0.12718	0.00565	0.04272	0.04310
SUB 9 BUS A	0.480	0.00371	0.01865	0.01902	0.00360	0.01730	0.01767	0.00377	0.01773	0.01812
SUB9 FEED	4.160	0.01928	0.14487	0.14615	0.02091	0.13612	0.13772	0.04551	0.08309	0.09474
SUB9 LS	0.480	0.00371	0.01865	0.01902	0.00360	0.01730	0.01767	0.00377	0.01773	0.01812
SUB 10 BUS B	0.480	0.00343	0.01774	0.01807	0.00325	0.01553	0.01586	0.00377	0.01773	0.01812
SUB10 FEED	4.160	0.01857	0.14391	0.14510	0.02017	0.13510	0.13660	0.04189	0.07942	0.08979
SUB10 LS	0.480	0.00343	0.01774	0.01807	0.00325	0.01553	0.01586	0.00377	0.01773	0.01812
SUB11 LS	0.480	0.00431	0.01849	0.01898	0.00414	0.01717	0.01767	0.00442	0.01751	0.01806
SUB12 LS	0.480	0.00398	0.01760	0.01805	0.00372	0.01548	0.01592	0.00442	0.01751	0.01806
SUBNATANT PUMP	0.480	0.02081	0.02377	0.03160	0.02085	0.02179	0.03016	0.05573	0.02848	0.06259
SUPERNANANT PS CP	0.480	0.03028	0.03779	0.04842	0.03031	0.03764	0.04833	0.08305	0.05843	0.10155
SWBD 11 BUS A	0.480	0.00531	0.02022	0.02090	0.00501	0.01865	0.01931	0.00808	0.02224	0.02366
SWBD11 LS	0.480	0.00531	0.02022	0.02090	0.00501	0.01865	0.01931	0.00808	0.02224	0.02366
SWBD 12 BUS B	0.480	0.00479	0.01907	0.01966	0.00433	0.01653	0.01709	0.00785	0.02194	0.02330
SWBD12 LS	0.480	0.00479	0.01907	0.01966	0.00433	0.01653	0.01709	0.00785	0.02194	0.02330
SWGR BUS A	4.160	0.01201	0.13507	0.13560	0.01370	0.12644	0.12718	0.00565	0.04272	0.04310
SWGR BUS B	4.160	0.01202	0.13508	0.13561	0.01371	0.12645	0.12719	0.00565	0.04272	0.04310
SWGR MAIN 1 LS	4.160	0.01202	0.13508	0.13561	0.01371	0.12645	0.12719	0.00565	0.04272	0.04310
SWGR MAIN 2 LS	4.160	0.01201	0.13507	0.13560	0.01370	0.12644	0.12718	0.00565	0.04272	0.04310
SWITCH 11	4.160	0.01995	0.14577	0.14713	0.02158	0.13702	0.13871	0.04914	0.08676	0.09971
SWITCH 12	4.160	0.01922	0.14479	0.14606	0.02081	0.13595	0.13754	0.04551	0.08309	0.09474
T-AC-1	0.480	0.23641	0.03128	0.23847	0.23646	0.02943	0.23828	0.73240	0.04276	0.73365
T-BLOWER AB1	4.160	0.14652	0.25810	0.29679	0.14366	0.24344	0.28267	0.55019	0.56392	0.78785
T-BLOWER AB2	4.160	0.14164	0.25694	0.29339	0.13888	0.24228	0.27926	0.54253	0.55891	0.77892
T-BLOWER AB3	4.160	0.13676	0.25578	0.29004	0.13409	0.24112	0.27590	0.53487	0.55390	0.77000
T-BLOWER AB4	4.160	0.13264	0.25503	0.28746	0.13162	0.24347	0.27677	0.51996	0.54155	0.75076

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Bus ID	kV	Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
		Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
T-BLOWER AB5	4.160	0.12775	0.25387	0.28420	0.12682	0.24231	0.27349	0.51230	0.53654	0.74184
T-DEEP WELL PUMP 1	0.480	0.01093	0.02864	0.03065	0.00933	0.02542	0.02708	0.03141	0.04540	0.05521
T-DEEP WELL PUMP 2	0.480	0.01131	0.02865	0.03080	0.00962	0.02462	0.02643	0.03387	0.04786	0.05863
T-DEEP WELL PUMP 3	0.480	0.01086	0.02799	0.03002	0.00928	0.02409	0.02581	0.03203	0.04602	0.05607
T-DEEP WELL PUMP 4	0.480	0.01258	0.03049	0.03298	0.01056	0.02691	0.02891	0.03664	0.05083	0.06266
T-DEEP WELL PUMP 5	0.480	0.01252	0.02994	0.03245	0.01043	0.02553	0.02758	0.03795	0.05208	0.06444
T-DEEP WELL PUMP 6	0.480	0.01244	0.02983	0.03232	0.01037	0.02544	0.02748	0.03764	0.05177	0.06401
T-DP1-WAS PUMP 5	0.480	0.19443	0.03704	0.19792	0.19445	0.03690	0.19792	0.60347	0.06009	0.60645
T-DP1-WAS PUMP 6	0.480	0.19443	0.03704	0.19792	0.19445	0.03690	0.19792	0.60347	0.06009	0.60645
T-DP2-WAS PUMP 1	0.480	0.09416	0.03337	0.09990	0.09420	0.03324	0.09989	0.28762	0.05109	0.29212
T-DP2-WAS PUMP 2	0.480	0.09416	0.03337	0.09990	0.09420	0.03324	0.09989	0.28762	0.05109	0.29212
T-GEN 1	4.160	0.06059	1.15117	1.15276	0.12260	1.10341	1.11019	0.00939	0.06576	0.06643
T-GEN 2	4.160	0.05394	1.02487	1.02629	0.11185	1.00666	1.01286	0.06383	0.44682	0.45135
T-MCC D4-BLOWER 1	0.480	0.03185	0.03788	0.04949	0.03017	0.03522	0.04638	0.09295	0.05939	0.11031
T-MCC D4-BLOWER 3	0.480	0.02769	0.03544	0.04498	0.02640	0.03292	0.04220	0.07878	0.05341	0.09518
T-MCC D4-PMP 1	0.480	0.04859	0.03948	0.06260	0.04644	0.03713	0.05945	0.14650	0.06208	0.15912
T-MCC D4-PMP 3	0.480	0.04104	0.03647	0.05490	0.03946	0.03418	0.05221	0.12130	0.05507	0.13322
T-MCC D5-BLOWER 2	0.480	0.03689	0.04088	0.05507	0.03468	0.03806	0.05149	0.11028	0.06669	0.12888
T-MCC D5-BLOWER 4	0.480	0.02769	0.03545	0.04498	0.02641	0.03293	0.04221	0.07878	0.05341	0.09518
T-MCC D5-PMP 2	0.480	0.05609	0.04252	0.07039	0.05329	0.04013	0.06671	0.17170	0.06909	0.18508
T-MCC D5-PMP 4	0.480	0.04104	0.03647	0.05490	0.03947	0.03419	0.05222	0.12130	0.05507	0.13322
T-MCCD1-PNL LD	0.208	0.03954	0.06050	0.07228	0.03954	0.06048	0.07226	0.03231	0.05461	0.06345
T-MCCD1-PNL LDW	0.208	0.03635	0.05669	0.06735	0.03635	0.05667	0.06733	0.03084	0.05213	0.06057
T-MCCHW1-PNL LHW 2	0.208	0.03150	0.05270	0.06139	0.03151	0.05267	0.06137	0.02864	0.04840	0.05624
T-SUB2-PNL CP	0.208	0.06248	0.06937	0.09336	0.06249	0.06935	0.09335	0.04302	0.06346	0.07667
T-SUB11-SWBD11	0.480	0.00431	0.01849	0.01898	0.00414	0.01717	0.01767	0.00442	0.01751	0.01806
T-SUB12-SWBD12	0.480	0.00398	0.01760	0.01805	0.00372	0.01548	0.01592	0.00442	0.01751	0.01806
T-TR-DP1-XLC	0.480	0.02643	0.03154	0.04115	0.02647	0.03142	0.04108	0.07427	0.04659	0.08767
T-TR-DP4-XLC	0.480	0.02456	0.03086	0.03944	0.02459	0.03074	0.03937	0.06843	0.04497	0.08188
T-TR-MCC 1-PNL XFMR	0.480	0.03678	0.03447	0.05041	0.03690	0.03268	0.04929	0.10566	0.05447	0.11887
T-TR-MCC 1-PNL XFMR (2)	0.208	0.09866	0.11015	0.14787	0.09868	0.10981	0.14764	0.09175	0.10368	0.13844
T-TR-MCC B1-PNL XFMR	0.480	0.01506	0.02159	0.02632	0.01510	0.01961	0.02475	0.03762	0.02310	0.04415
T-TR-MCC B1-PNL XFMR2	0.208	0.03514	0.05866	0.06838	0.03515	0.05829	0.06807	0.03231	0.05461	0.06345
T-TR-MCC B2-PNL (2)	0.208	0.03207	0.05288	0.06184	0.03207	0.05285	0.06182	0.02864	0.04840	0.05624
T-TR-MCC B2-PNL LB1 (2)	0.208	0.03333	0.05279	0.06243	0.03333	0.05276	0.06241	0.02864	0.04840	0.05624
T-TR-MCC D1-PNL LD 2	0.480	0.03058	0.03061	0.04327	0.03061	0.03047	0.04319	0.08400	0.04078	0.09337
T-TR-MCC D1-PNL LD2 (2)	0.208	0.03585	0.05663	0.06703	0.03586	0.05661	0.06701	0.03011	0.05089	0.05913

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
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 Engineer: KTW  
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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
T-TR-MCCB2-PNL LB1	0.480	0.02494	0.02337	0.03418	0.02496	0.02322	0.03409	0.06710	0.02387	0.07122
T-TR-MCCB2-PNL XFMR	0.480	0.01824	0.02382	0.03000	0.01826	0.02367	0.02989	0.04600	0.02498	0.05234
T-TR-MCCB4-PNL LP2	0.480	0.01519	0.02255	0.02719	0.01521	0.02241	0.02708	0.03639	0.02187	0.04246
T-TR-MCCB4-PNL LP2 (2)	0.208	0.09460	0.10791	0.14351	0.09461	0.10788	0.14349	0.09175	0.10368	0.13844
T-TR-MCCD1-PNL LD	0.480	0.03848	0.03139	0.04966	0.03850	0.03125	0.04959	0.10887	0.04269	0.11694
T-TR-MCCDW1-PNL LDW	0.480	0.02932	0.02432	0.03809	0.02933	0.02418	0.03801	0.08000	0.02529	0.08390
T-TR-MCCHW1-PNL LHW	0.480	0.01523	0.02285	0.02747	0.01525	0.02272	0.02736	0.03816	0.02434	0.04526
T-TR-SUB1/2-PNL L1 XFMR	0.480	0.01126	0.02321	0.02580	0.01128	0.02309	0.02570	0.02652	0.02615	0.03724
T-TR-SUB1/2-PNL L1 XFMR 2	0.208	0.01475	0.02571	0.02963	0.01475	0.02568	0.02962	0.01263	0.02135	0.02480
T-TR-SUB2-PNL CP XFMR	0.480	0.12656	0.03591	0.13155	0.12658	0.03579	0.13155	0.38971	0.05739	0.39391
T-TR-SUB2-PNL CP XFMR 2	0.208	0.06048	0.06880	0.09161	0.06049	0.06878	0.09159	0.03672	0.06206	0.07211
T-TR-T7A-PRI	4.160	0.11555	0.26088	0.28532	0.11628	0.25022	0.27591	0.50575	0.54583	0.74412
T-TR-T7A-SEC	0.480	0.00539	0.02210	0.02275	0.00555	0.02050	0.02124	0.00422	0.01983	0.02028
T-TR-T8A-PRI	4.160	0.11554	0.26087	0.28531	0.11628	0.25019	0.27590	0.50575	0.54583	0.74412
T-TR-T8A-SEC	0.480	0.00540	0.02210	0.02275	0.00556	0.02051	0.02125	0.00422	0.01983	0.02028
THICK WAS 3 AFD	0.480	0.00731	0.02134	0.02256	0.00735	0.01936	0.02071	0.01321	0.02251	0.02609
THICK WAS 4 AFD	0.480	0.00731	0.02134	0.02256	0.00735	0.01936	0.02071	0.01321	0.02251	0.02609
VALVE OPERATOR	0.480	0.05060	0.02265	0.05544	0.05069	0.02082	0.05480	0.14927	0.02548	0.15143
WATER HEATER	0.480	0.01572	0.02364	0.02839	0.01574	0.02350	0.02829	0.03716	0.02364	0.04404



**APPENDIX B5 – SHORT CIRCUIT STUDY  
(30 CYCLE SHORT-CIRCUIT SUMMARY REPORT**

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: SWWRF

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 SN: CAROLLOWAN  
 Revision: Base  
 Config.: Normal

**Short-Circuit Summary Report**

30 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
54" METER VAULT VALVE	0.48	0.929	-0.119	0.936	0.549	-0.050	0.551	0.103	0.804	0.811	-0.297	-0.790	0.844
A/C ROOF UNIT #2	0.48	4.522	-2.770	5.302	3.226	-1.324	3.487	2.399	3.916	4.592	-3.623	-3.521	5.052
ABFV-1	0.48	3.585	-2.484	4.362	2.594	-1.285	2.895	2.151	3.105	3.777	-3.146	-2.698	4.145
ABFV-2	0.48	3.312	-1.944	3.841	2.292	-0.957	2.484	1.684	2.868	3.326	-2.546	-2.572	3.619
ABFV-3	0.48	3.044	-1.554	3.417	2.040	-0.738	2.169	1.346	2.636	2.960	-2.103	-2.410	3.199
ABFV-4	0.48	2.797	-1.266	3.071	1.831	-0.587	1.922	1.096	2.423	2.659	-1.770	-2.245	2.859
ABFV-5	0.48	2.578	-1.050	2.783	1.657	-0.477	1.724	0.909	2.232	2.410	-1.514	-2.089	2.580
ABW #1 EFF. WEIR GATE	0.48	0.929	-0.119	0.936	0.549	-0.050	0.551	0.103	0.804	0.811	-0.297	-0.790	0.844
ABW #1 FESTON SYSTEM	0.48	2.133	-0.671	2.236	1.320	-0.296	1.352	0.581	1.847	1.937	-1.056	-1.759	2.052
ABW #1 INF. WEIR GATE	0.48	0.968	-0.127	0.976	0.572	-0.053	0.575	0.110	0.838	0.845	-0.313	-0.823	0.880
ABW #1 SLUICE GATE #1	0.48	0.592	-0.048	0.594	0.347	-0.020	0.348	0.042	0.512	0.514	-0.164	-0.506	0.532
ABW #3 FESTON SYSTEM	0.48	2.062	-0.629	2.155	1.271	-0.277	1.301	0.545	1.785	1.867	-1.002	-1.702	1.975
ABW #3,4,5 FESTON SYSTEM	0.48	1.286	-0.241	1.308	0.768	-0.103	0.775	0.209	1.114	1.133	-0.482	-1.083	1.186
ABW 3,4,5 FLOCCULATOR	0.48	0.567	-0.045	0.569	0.333	-0.019	0.333	0.039	0.491	0.493	-0.157	-0.486	0.510
ABW #3,4,6 FESTON SYSTEM	0.48	1.332	-0.257	1.357	0.797	-0.110	0.804	0.223	1.154	1.175	-0.506	-1.121	1.230
ABW #3,4,6 SLUICE GATE	0.48	0.860	-0.105	0.866	0.507	-0.044	0.509	0.091	0.745	0.750	-0.271	-0.732	0.780
ABW #5 SLUICE GATE	0.48	0.929	-0.119	0.936	0.549	-0.050	0.551	0.103	0.804	0.811	-0.297	-0.790	0.844
ABW #6 FESTON SYSTEM	0.48	2.057	-0.631	2.152	1.269	-0.279	1.299	0.547	1.781	1.863	-1.004	-1.698	1.972
ABW #6 SLUICE GATE	0.48	0.893	-0.112	0.900	0.527	-0.047	0.529	0.097	0.773	0.779	-0.284	-0.760	0.811
ABW 6,7 FLASH MIXER #3	0.48	0.801	-0.093	0.806	0.472	-0.040	0.474	0.081	0.694	0.698	-0.248	-0.682	0.726
ABW #7 FESTON SYSTEM	0.48	1.860	-0.533	1.935	1.139	-0.236	1.163	0.462	1.611	1.676	-0.871	-1.540	1.769
ABW FILTER #2	0.48	1.990	-0.594	2.077	1.224	-0.262	1.252	0.515	1.723	1.798	-0.955	-1.645	1.902
ABW SLUICE GATE	0.48	0.567	-0.045	0.569	0.333	-0.019	0.333	0.039	0.491	0.493	-0.157	-0.486	0.510
ACU-1	0.48	3.697	-4.730	6.004	3.238	-3.080	4.469	4.097	3.202	5.199	-5.473	-2.101	5.862
AFD-MCC D1-THICKENER	0.48	4.646	-4.451	6.434	3.906	-2.592	4.688	3.854	4.023	5.572	-5.462	-3.175	6.318
AIR COMPRESSOR	0.48	5.807	-5.914	8.288	5.291	-3.514	6.352	5.122	5.029	7.178	-7.380	-3.910	8.352
AIR COMPRESSOR 2	0.48	5.760	-5.453	7.931	5.069	-3.114	5.949	4.722	4.988	6.869	-6.843	-4.017	7.934
BASIN 1 ADFV 13	0.48	2.694	-0.750	2.796	1.679	-0.296	1.705	0.650	2.333	2.422	-1.256	-2.252	2.579
BASIN 2 ADFV 14	0.48	2.200	-0.513	2.259	1.347	-0.201	1.362	0.444	1.905	1.956	-0.928	-1.850	2.070
BASIN 3 ADFV 15	0.48	1.752	-0.340	1.784	1.058	-0.134	1.066	0.294	1.517	1.545	-0.672	-1.480	1.625
BASIN 4 ADFV 16	0.48	1.453	-0.245	1.473	0.870	-0.098	0.876	0.212	1.258	1.276	-0.522	-1.231	1.337

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
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 Filename: SWWRF

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 SN: CAROLLOWAN  
 Revision: Base  
 Config.: Normal

30 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
BELT FILTER PRESS 1	0.48	4.897	-3.454	5.993	3.763	-1.735	4.144	2.992	4.241	5.190	-4.466	-3.724	5.815
BELT FILTER PRESS 2	0.48	4.897	-3.454	5.993	3.763	-1.735	4.144	2.992	4.241	5.190	-4.466	-3.724	5.815
BELT FILTER PRESS 3	0.48	5.316	-4.488	6.957	4.413	-2.438	5.042	3.887	4.604	6.025	-5.680	-3.855	6.865
BELT FILTER PRESS 4	0.48	5.316	-4.488	6.957	4.413	-2.438	5.042	3.887	4.604	6.025	-5.680	-3.855	6.865
BELT FILTER PRESS 5	0.48	5.589	-5.988	8.191	5.197	-3.683	6.370	5.185	4.840	7.093	-7.436	-3.639	8.279
BELT FILTER PRESS 6	0.48	5.589	-5.988	8.191	5.197	-3.683	6.370	5.185	4.840	7.093	-7.436	-3.639	8.279
BLOWER #6 INLET VALVE	0.48	3.581	-5.578	6.628	3.339	-3.919	5.148	4.830	3.101	5.740	-6.312	-1.634	6.520
BLOWER A LS	4.16	3.087	-8.233	8.793	3.234	-5.036	5.985	7.130	2.673	7.615	-8.528	-0.937	8.580
BLOWER B LS	4.16	3.081	-8.162	8.724	3.205	-4.970	5.914	7.069	2.668	7.555	-8.449	-0.957	8.503
BLOWER BUS A	4.16	3.087	-8.233	8.793	3.234	-5.036	5.985	7.130	2.673	7.615	-8.528	-0.937	8.580
BLOWER BUS B	4.16	3.081	-8.162	8.724	3.205	-4.970	5.914	7.069	2.668	7.555	-8.449	-0.957	8.503
CLARIFIER 1 CP	0.48	1.453	-0.316	1.487	0.873	-0.137	0.884	0.273	1.258	1.287	-0.585	-1.217	1.350
CLARIFIER 2 CP	0.48	1.466	-0.318	1.500	0.881	-0.137	0.892	0.275	1.269	1.299	-0.590	-1.228	1.363
CLARIFIER 5 CP	0.48	1.450	-0.317	1.484	0.872	-0.137	0.883	0.274	1.256	1.285	-0.585	-1.215	1.348
CONVEYOR CP	0.48	4.202	-2.103	4.699	2.910	-0.930	3.055	1.821	3.639	4.070	-2.913	-3.377	4.460
D-DP1-RAS PUMP 7	0.48	4.040	-4.590	6.115	3.391	-2.814	4.407	3.975	3.498	5.295	-5.376	-2.528	5.941
D-DP1-RAS PUMP 8	0.48	4.040	-4.590	6.115	3.391	-2.814	4.407	3.975	3.498	5.295	-5.376	-2.528	5.941
D-DP1-WAS 5	0.48	4.356	-4.009	5.920	3.459	-2.262	4.133	3.472	3.772	5.127	-4.856	-3.030	5.724
D-DP1-WAS 6	0.48	4.356	-4.009	5.920	3.459	-2.262	4.133	3.472	3.772	5.127	-4.856	-3.030	5.724
D-DP2-RAS PUMP 1	0.48	3.880	-3.541	5.253	3.009	-1.999	3.613	3.066	3.360	4.549	-4.259	-2.698	5.041
D-DP2-RAS PUMP 3	0.48	3.880	-3.541	5.253	3.009	-1.999	3.613	3.066	3.360	4.549	-4.259	-2.698	5.041
D-DP2-WAS 1	0.48	4.392	-4.041	5.968	3.492	-2.279	4.170	3.500	3.803	5.168	-4.897	-3.057	5.773
D-DP2-WAS 2	0.48	4.392	-4.041	5.968	3.492	-2.279	4.170	3.500	3.803	5.168	-4.897	-3.057	5.773
D-DP4-RAS PUMP 2	0.48	4.082	-5.352	6.731	3.618	-3.472	5.014	4.635	3.535	5.829	-6.178	-2.301	6.593
D-DP4-WAS 2	0.48	4.462	-4.249	6.162	3.598	-2.428	4.341	3.680	3.864	5.336	-5.130	-3.064	5.976
D-DP4-WAS PUMP 2	0.48	2.655	-0.948	2.819	1.674	-0.416	1.725	0.821	2.299	2.442	-1.428	-2.176	2.603
D-MCC 1-EXHAUST 1	0.48	2.578	-1.050	2.783	1.657	-0.477	1.724	0.909	2.232	2.410	-1.514	-2.089	2.580
D-MCC 1-EXHAUST 2	0.48	2.578	-1.050	2.783	1.657	-0.477	1.724	0.909	2.232	2.410	-1.514	-2.089	2.580
D-MCC 1-EXHAUST 3	0.48	2.578	-1.050	2.783	1.657	-0.477	1.724	0.909	2.232	2.410	-1.514	-2.089	2.580
D-MCC 1-EXHAUST 4	0.48	2.578	-1.050	2.783	1.657	-0.477	1.724	0.909	2.232	2.410	-1.514	-2.089	2.580
D-MCC B1-AIR BLOWER	0.48	4.798	-8.533	9.789	5.312	-6.750	8.590	7.390	4.155	8.478	-10.051	-1.493	10.161
D-MCC B1-DAF THICK 2	0.48	2.830	-0.788	2.938	1.769	-0.305	1.795	0.682	2.451	2.544	-1.321	-2.370	2.713
D-MCC B1-EAST DAF RECYC	0.48	4.882	-8.193	9.538	5.295	-6.299	8.229	7.095	4.228	8.260	-9.694	-1.800	9.860
D-MCC B1-PRESSURIZATION	0.48	5.030	-6.199	7.983	4.761	-4.062	6.258	5.368	4.356	6.914	-7.468	-2.947	8.029

Project: MANATEE COUNTY ESS  
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30 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
D-MCC B1-THICK WAS 3	0.48	5.047	-6.701	8.389	4.951	-4.565	6.734	5.803	4.371	7.265	-8.041	-2.751	8.499
D-MCC B1-THICK WAS 4	0.48	5.047	-6.701	8.389	4.951	-4.565	6.734	5.803	4.371	7.265	-8.041	-2.751	8.499
D-MCC B1-WEST DAF RECYC	0.48	4.882	-8.193	9.538	5.295	-6.299	8.229	7.095	4.228	8.260	-9.694	-1.800	9.860
D-MCC B2-AIR COMPRESSOR	0.48	5.148	-3.797	6.397	4.020	-1.932	4.460	3.288	4.459	5.540	-4.874	-3.881	6.230
D-MCC B2-EQ DIVERSION VLV	0.48	2.718	-0.710	2.809	1.688	-0.272	1.710	0.615	2.353	2.432	-1.223	-2.281	2.589
D-MCC B2-RETURN SLUDGE 1	0.48	3.866	-1.700	4.223	2.586	-0.729	2.687	1.473	3.348	3.657	-2.430	-3.144	3.973
D-MCC B2-RETURN SLUDGE 2	0.48	4.724	-2.669	5.426	3.386	-1.216	3.598	2.312	4.091	4.699	-3.598	-3.747	5.194
D-MCC B2-RETURN SLUDGE 3	0.48	4.265	-2.103	4.756	2.937	-0.923	3.078	1.821	3.694	4.118	-2.920	-3.434	4.508
D-MCC B2-RETURN SLUDGE 4	0.48	4.265	-2.103	4.756	2.937	-0.923	3.078	1.821	3.694	4.118	-2.920	-3.434	4.508
D-MCC B2-RETURN SLUDGE 5	0.48	3.866	-1.700	4.223	2.586	-0.729	2.687	1.473	3.348	3.657	-2.430	-3.144	3.973
D-MCC B3-STANDBY PRESSURE	0.48	4.978	-7.181	8.738	5.053	-5.103	7.181	6.219	4.311	7.567	-8.564	-2.449	8.907
D-MCC D1-BFP FEED PUMP	0.48	3.232	-1.467	3.549	2.146	-0.662	2.246	1.270	2.799	3.074	-2.063	-2.604	3.323
D-MCC D1-BFP FEED PUMP5	0.48	3.341	-1.712	3.754	2.267	-0.802	2.404	1.482	2.893	3.251	-2.328	-2.652	3.529
D-MCC D1-GRAVITY THICK	0.48	1.746	-0.392	1.790	1.061	-0.161	1.073	0.339	1.512	1.550	-0.719	-1.466	1.633
D-MCC D1-SLUDGE RECIRC 1	0.48	4.267	-3.874	5.763	3.452	-2.207	4.097	3.355	3.696	4.991	-4.749	-2.974	5.604
D-MCC D1-SLUDGE RECIRC 3	0.48	4.116	-3.350	5.307	3.194	-1.826	3.679	2.901	3.565	4.596	-4.164	-2.980	5.121
D-MCC D1-SLUDGE RECIRC 4	0.48	3.944	-2.918	4.906	2.957	-1.536	3.332	2.527	3.416	4.249	-3.679	-2.930	4.703
D-MCC D1-SLUDGE TRANSFER1	0.48	4.372	-4.511	6.282	3.720	-2.718	4.607	3.906	3.786	5.440	-5.452	-2.873	6.162
D-MCC D1-THICKENER	0.48	1.746	-0.392	1.790	1.061	-0.161	1.073	0.339	1.512	1.550	-0.719	-1.466	1.633
D-MCC D2-BFP FEED PUMP1	0.48	3.860	-2.282	4.484	2.734	-1.102	2.948	1.976	3.343	3.883	-3.013	-3.011	4.259
D-MCC D2-BFP FEED PUMP4	0.48	3.043	-1.289	3.305	1.993	-0.574	2.074	1.117	2.636	2.862	-1.849	-2.467	3.083
D-MCC D2-BFP FEED PUMP6	0.48	2.726	-1.019	2.910	1.747	-0.445	1.802	0.882	2.361	2.520	-1.520	-2.231	2.699
D-MCC D2-SLUDGE RECIRC 2	0.48	3.744	-2.271	4.380	2.657	-1.113	2.880	1.967	3.243	3.793	-2.976	-2.903	4.157
D-MCC D2-SLUDGE TRANSFER2	0.48	1.819	-0.460	1.876	1.113	-0.194	1.130	0.398	1.575	1.625	-0.797	-1.519	1.715
D-MCC D2-SLUDGE TRANSFER3	0.48	3.464	-1.873	3.938	2.381	-0.889	2.542	1.622	3.000	3.411	-2.515	-2.732	3.713
D-MCC D2-SLUDGE TRANSFER4	0.48	4.507	-4.528	6.388	3.827	-2.696	4.681	3.921	3.903	5.533	-5.507	-3.006	6.274
D-MCC DW1-PLANT DRAIN1	0.48	2.090	-0.553	2.162	1.288	-0.229	1.308	0.479	1.810	1.872	-0.942	-1.744	1.982
D-MCC DW1-PLANT DRAIN2	0.48	2.090	-0.553	2.162	1.288	-0.229	1.308	0.479	1.810	1.872	-0.942	-1.744	1.982
D-MCC DW1-PLANT DRAIN3	0.48	2.090	-0.553	2.162	1.288	-0.229	1.308	0.479	1.810	1.872	-0.942	-1.744	1.982
D-MCC E1-EF-7	0.48	2.543	-0.688	2.635	1.568	-0.279	1.593	0.596	2.202	2.282	-1.160	-2.124	2.420

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30 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
D-MCC E1-FLASH MIXER 1	0.48	0.505	-0.038	0.507	0.296	-0.016	0.296	0.033	0.437	0.439	-0.137	-0.433	0.454
D-MCC E1-FLASH MIXER 2	0.48	0.860	-0.105	0.866	0.507	-0.044	0.509	0.091	0.745	0.750	-0.271	-0.732	0.780
D-MCC E2-EF-5.1	0.48	1.630	-0.272	1.653	0.975	-0.106	0.981	0.236	1.412	1.431	-0.583	-1.382	1.500
D-MCC E2-EF-5.2	0.48	1.630	-0.272	1.653	0.975	-0.106	0.981	0.236	1.412	1.431	-0.583	-1.382	1.500
D-MCC HW1-CONVEYOR EAST	0.48	3.736	-1.410	3.993	2.425	-0.577	2.492	1.221	3.235	3.458	-2.108	-3.077	3.731
D-MCC HW1-FINAL CLAR. 3	0.48	0.265	-0.012	0.265	0.155	-0.005	0.155	0.010	0.230	0.230	-0.065	-0.228	0.237
D-MCC HW1-FINAL CLAR. 4	0.48	0.269	-0.012	0.269	0.157	-0.005	0.157	0.010	0.233	0.233	-0.066	-0.232	0.241
D-MCC HW1-GRIT CLASS WEST	0.48	1.212	-0.155	1.222	0.719	-0.060	0.721	0.135	1.050	1.058	-0.390	-1.033	1.104
D-MCC HW1-PRI. SLUDGE	0.48	0.381	-0.024	0.382	0.223	-0.010	0.223	0.021	0.330	0.330	-0.100	-0.327	0.341
D-MCC HW1-RSP 4	0.48	3.467	-2.204	4.108	2.429	-1.108	2.670	1.909	3.003	3.558	-2.827	-2.655	3.878
D-MCC HW1-RSP 5	0.48	3.467	-2.204	4.108	2.429	-1.108	2.670	1.909	3.003	3.558	-2.827	-2.655	3.878
D-MCC HW1-WEST CONVEYOR	0.48	1.162	-0.144	1.171	0.688	-0.056	0.691	0.125	1.006	1.014	-0.369	-0.990	1.057
D-MCC HW2-GRIT CLASS 2	0.48	1.846	-0.338	1.877	1.111	-0.130	1.119	0.293	1.599	1.626	-0.689	-1.563	1.709
D-MCC HW2-GRIT PUMP 2	0.48	3.232	-1.073	3.406	2.052	-0.435	2.097	0.929	2.799	2.949	-1.674	-2.680	3.160
D-MCC HW2-PRI. SLUDGE 1	0.48	0.525	-0.039	0.526	0.308	-0.016	0.308	0.034	0.454	0.456	-0.143	-0.450	0.472
D-MCC HW2-PRI. SLUDGE 3	0.48	0.525	-0.039	0.526	0.308	-0.016	0.308	0.034	0.454	0.456	-0.143	-0.450	0.472
D-MCC HW2-RSP 6	0.48	3.433	-2.200	4.077	2.407	-1.110	2.651	1.905	2.973	3.531	-2.816	-2.623	3.848
D-MCC HW2-WAS PUMP 3	0.48	0.830	-0.098	0.836	0.490	-0.041	0.491	0.085	0.719	0.724	-0.258	-0.707	0.753
D-MCC HW2-WAS PUMP 4	0.48	0.830	-0.098	0.836	0.490	-0.041	0.491	0.085	0.719	0.724	-0.258	-0.707	0.753
D-MCCB4-SUBM PUMP START	0.48	2.121	-0.548	2.191	1.304	-0.226	1.323	0.474	1.837	1.897	-0.943	-1.773	2.008
DAF THICKENER 2 AFD	0.48	5.729	-4.313	7.171	4.610	-2.179	5.099	3.735	4.961	6.210	-5.573	-4.328	7.056
DAVIS SCRUBBER	0.48	5.123	-6.375	8.178	4.801	-4.134	6.336	5.521	4.436	7.082	-7.622	-3.006	8.194
DEEP WELL PUMP 1 VFD	0.48	2.895	-12.855	13.177	3.172	-12.940	13.323	11.133	2.507	11.412	-12.862	4.001	13.470
DEEP WELL PUMP 2 VFD	0.48	3.008	-12.303	12.665	3.369	-12.064	12.526	10.655	2.605	10.968	-12.507	3.300	12.935
DEEP WELL PUMP 3 VFD	0.48	2.848	-13.061	13.368	3.085	-13.263	13.617	11.311	2.466	11.577	-12.980	4.266	13.663
DEEP WELL PUMP 4 VFD	0.48	3.322	-11.581	12.048	3.620	-11.040	11.619	10.030	2.877	10.434	-11.960	2.382	12.195
DEEP WELL PUMP 5 VFD	0.48	3.347	-11.417	11.897	3.656	-10.792	11.394	9.887	2.899	10.303	-11.834	2.200	12.036
DEEP WELL PUMP 6 VFD	0.48	3.323	-11.663	12.127	3.623	-11.152	11.726	10.100	2.877	10.502	-12.035	2.450	12.282
DEGRITTER CP	0.48	2.858	-0.841	2.979	1.785	-0.337	1.817	0.729	2.475	2.580	-1.373	-2.382	2.750
DP1 MAIN LS	0.48	3.418	-7.342	8.098	3.452	-5.657	6.627	6.358	2.960	7.013	-7.987	-0.702	8.018
DP2 MAIN LS	0.48	3.423	-7.431	8.182	3.473	-5.752	6.719	6.436	2.965	7.086	-8.080	-0.663	8.107
DP4 MAIN LS	0.48	3.230	-7.796	8.439	3.324	-6.206	7.040	6.752	2.797	7.308	-8.352	-0.257	8.356
EFF. FILTER PS CNTRL	0.48	3.702	-7.451	8.320	3.757	-5.680	6.810	6.453	3.206	7.206	-8.225	-0.965	8.281

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30 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
ELECTRIC ROLL-UP DOOR	0.48	3.044	-1.554	3.417	2.040	-0.738	2.169	1.346	2.636	2.960	-2.103	-2.410	3.199
EQ TANK RETURN	0.48	2.485	-0.595	2.555	1.530	-0.227	1.547	0.516	2.152	2.213	-1.066	-2.092	2.348
FPL PRIMARY	23.00	0.148	-1.272	1.280	0.000	0.000	0.000	1.101	0.128	1.109	1.101	0.128	1.109
FPL SERVICE	4.16	1.391	-16.697	16.755	1.858	-21.899	21.978	14.460	1.205	14.510	-15.855	14.699	21.621
HOIST	0.48	5.636	-4.043	6.936	4.444	-1.997	4.872	3.501	4.881	6.007	-5.256	-4.306	6.795
LIGHTING PANEL	0.21	0.973	-1.242	1.577	1.015	-1.101	1.497	1.075	0.842	1.366	-1.592	-0.357	1.632
LTG. PNL	0.21	1.018	-1.597	1.894	1.055	-1.604	1.920	1.383	0.881	1.640	-1.930	-0.076	1.932
MAIN GATE CP	0.48	0.750	-0.083	0.755	0.442	-0.035	0.443	0.072	0.650	0.654	-0.228	-0.639	0.679
MCC 1	0.48	3.558	-5.631	6.661	3.330	-3.978	5.188	4.877	3.082	5.769	-6.359	-1.587	6.554
MCC B1	0.48	3.037	-11.578	11.969	3.307	-11.681	12.140	10.026	2.630	10.366	-11.821	3.258	12.262
MCC B2	0.48	2.981	-11.926	12.292	3.195	-12.234	12.645	10.328	2.581	10.645	-12.042	3.697	12.597
MCC B3	0.48	3.060	-11.417	11.820	3.351	-11.424	11.905	9.888	2.650	10.237	-11.711	3.058	12.104
MCC B4	0.48	2.981	-11.926	12.292	3.195	-12.234	12.645	10.328	2.581	10.645	-12.042	3.697	12.597
MCC D1	0.48	3.169	-8.309	8.893	3.374	-7.159	7.915	7.196	2.744	7.701	-8.901	0.370	8.909
MCC D2	0.48	3.166	-8.264	8.850	3.365	-7.104	7.861	7.157	2.741	7.664	-8.855	0.342	8.862
MCC D4 LS	0.48	2.876	-10.313	10.707	3.094	-10.409	10.859	8.931	2.491	9.272	-10.592	2.759	10.946
MCC D5 LS	0.48	2.876	-10.313	10.707	3.094	-10.409	10.859	8.931	2.491	9.272	-10.592	2.759	10.946
MCC DW1	0.48	3.040	-11.518	11.912	3.271	-11.790	12.235	9.975	2.633	10.316	-11.736	3.403	12.219
MCC DW2	0.48	3.040	-11.518	11.912	3.271	-11.790	12.235	9.975	2.633	10.316	-11.736	3.403	12.219
MCC E1	0.48	2.869	-11.641	11.989	3.164	-11.186	11.625	10.081	2.485	10.383	-11.787	2.886	12.135
MCC E2	0.48	2.857	-11.803	12.144	3.149	-11.411	11.838	10.222	2.474	10.517	-11.923	3.037	12.304
MCC HW 1	0.48	2.841	-12.317	12.640	3.054	-12.421	12.791	10.667	2.461	10.947	-12.304	3.800	12.878
MCC HW 2	0.48	2.869	-11.994	12.332	3.111	-11.924	12.323	10.387	2.484	10.680	-12.062	3.438	12.542
MCC-D4	0.48	2.876	-10.313	10.707	3.094	-10.409	10.859	8.931	2.491	9.272	-10.592	2.759	10.946
MCC-D5	0.48	2.876	-10.313	10.707	3.094	-10.409	10.859	8.931	2.491	9.272	-10.592	2.759	10.946
MCC1 LS	0.48	3.558	-5.631	6.661	3.330	-3.978	5.188	4.877	3.082	5.769	-6.359	-1.587	6.554
MCCB1 LS	0.48	3.037	-11.578	11.969	3.307	-11.681	12.140	10.026	2.630	10.366	-11.821	3.258	12.262
MCCD1 LS	0.48	3.169	-8.309	8.893	3.374	-7.159	7.915	7.196	2.744	7.701	-8.901	0.370	8.909
MCCD2 LS	0.48	3.166	-8.264	8.850	3.365	-7.104	7.861	7.157	2.741	7.664	-8.855	0.342	8.862
MECH SCREEN CP	0.48	2.502	-0.590	2.571	1.534	-0.226	1.550	0.511	2.167	2.226	-1.062	-2.106	2.358
MOV RATE OF FLOW	0.48	0.861	-0.105	0.867	0.508	-0.044	0.510	0.091	0.745	0.751	-0.270	-0.732	0.781
MTS-AC1-LOAD	0.48	1.703	-0.326	1.734	1.032	-0.125	1.039	0.282	1.475	1.502	-0.651	-1.441	1.582
MTS-MCC D4 LINE	0.48	1.703	-0.326	1.734	1.032	-0.125	1.039	0.282	1.475	1.502	-0.651	-1.441	1.582
MTS-MCC D5-LINE	0.48	1.703	-0.326	1.734	1.032	-0.125	1.039	0.282	1.475	1.502	-0.651	-1.441	1.582

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Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
NEW MAINT. BLDG	0.48	3.362	-6.216	7.067	3.287	-4.675	5.715	5.383	2.912	6.120	-6.901	-1.078	6.985
OLD MAINTENANCE BLDG	0.48	3.811	-2.740	4.694	2.821	-1.430	3.163	2.373	3.301	4.065	-3.465	-2.849	4.486
PLANT DRAIN #3	0.48	3.322	-11.031	11.520	3.763	-10.955	11.583	9.553	2.877	9.977	-11.653	2.545	11.928
PLANT DRAIN PS CTL PNL	0.48	3.631	-6.544	7.484	3.510	-4.754	5.909	5.667	3.145	6.481	-7.261	-1.325	7.381
PMS-7A LS	4.16	3.162	-7.775	8.393	3.127	-4.705	5.649	6.733	2.739	7.269	-8.062	-1.117	8.139
PMS-8A LS	4.16	3.162	-7.775	8.393	3.127	-4.705	5.649	6.733	2.739	7.269	-8.062	-1.117	8.139
PNL CP	0.21	0.855	-0.928	1.262	0.871	-1.001	1.327	0.804	0.741	1.093	0.362	1.282	1.332
PNL DP #1	0.48	3.418	-7.342	8.098	3.452	-5.657	6.627	6.358	2.960	7.013	-7.987	-0.702	8.018
PNL DP #2	0.48	3.423	-7.431	8.182	3.473	-5.752	6.719	6.436	2.965	7.086	-8.080	-0.663	8.107
PNL DP #4	0.48	3.230	-7.796	8.439	3.324	-6.206	7.040	6.752	2.797	7.308	-8.352	-0.257	8.356
PNL L1	0.21	1.476	-2.024	2.505	1.360	-1.593	2.095	1.753	1.279	2.170	-2.372	-0.629	2.454
PNL LB1	0.21	1.035	-1.564	1.876	1.067	-1.582	1.908	1.355	0.897	1.625	-1.904	-0.097	1.907
PNL LC1/LC2	0.21	1.052	-1.461	1.801	1.102	-1.371	1.759	1.266	0.911	1.560	-1.836	-0.271	1.856
PNL LD	0.21	0.911	-1.367	1.643	0.935	-1.420	1.700	1.184	0.789	1.423	0.704	1.528	1.682
PNL LD 2	0.21	0.966	-1.460	1.750	1.000	-1.488	1.793	1.264	0.836	1.516	-1.783	-0.078	1.785
PNL LDW	0.21	0.966	-1.474	1.762	0.988	-1.516	1.809	1.276	0.836	1.526	0.771	1.617	1.791
PNL LHW	0.21	1.010	-1.646	1.931	1.043	-1.672	1.970	1.426	0.874	1.673	-1.965	-0.026	1.965
PNL LP1	0.21	0.539	-0.587	0.797	0.549	-0.589	0.805	0.509	0.467	0.690	-0.789	-0.172	0.807
PNL LP2	0.21	0.551	-0.601	0.815	0.558	-0.588	0.810	0.521	0.477	0.706	-0.803	-0.190	0.825
PNL P3	0.48	4.447	-9.898	10.851	5.264	-8.695	10.164	8.572	3.851	9.397	-11.431	-0.094	11.432
PNL PC/TC-2	0.21	1.033	-1.575	1.883	1.081	-1.546	1.886	1.364	0.894	1.631	-1.928	-0.137	1.933
PNL PC/TC-3	0.21	1.065	-1.430	1.783	1.108	-1.350	1.747	1.238	0.922	1.544	-1.810	-0.287	1.832
PNL PC/TC-4	0.21	0.993	-1.355	1.680	1.033	-1.308	1.667	1.174	0.860	1.455	-1.707	-0.231	1.723
PNL XLC	0.21	0.293	-0.488	0.569	0.295	-0.495	0.576	0.423	0.254	0.493	0.274	0.504	0.574
PNL XLC (2)	0.21	0.293	-0.489	0.570	0.295	-0.495	0.577	0.424	0.253	0.494	0.275	0.504	0.574
PNL-P1	0.48	3.778	-3.444	5.112	2.915	-1.945	3.504	2.982	3.272	4.427	-4.135	-2.626	4.899
PNL-P4	0.48	4.983	-5.643	7.528	4.400	-3.468	5.603	4.887	4.315	6.519	-6.745	-3.143	7.441
POLYMER FEED 5, 6	0.48	2.534	-0.684	2.625	1.576	-0.270	1.599	0.593	2.194	2.273	-1.161	-2.121	2.418
POLYMER FEED CP	0.48	2.292	-0.567	2.361	1.412	-0.223	1.430	0.491	1.985	2.045	-0.999	-1.924	2.168
POLYMER MIX CP	0.48	2.292	-0.567	2.361	1.412	-0.223	1.430	0.491	1.985	2.045	-0.999	-1.924	2.168
RAS 1 VFD	0.48	3.734	-6.780	7.740	3.655	-4.966	6.166	5.872	3.233	6.703	-7.546	-1.326	7.661
RAS 2 VFD	0.48	3.610	-7.129	7.991	3.604	-5.365	6.464	6.174	3.127	6.920	-7.853	-1.025	7.919
RAS 3 VFD	0.48	3.734	-6.780	7.740	3.655	-4.966	6.166	5.872	3.233	6.703	-7.546	-1.326	7.661
RAS 7 VFD	0.48	3.717	-6.701	7.663	3.623	-4.890	6.086	5.804	3.219	6.637	-7.458	-1.345	7.578

Project: MANATEE COUNTY ESS  
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30 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
RAS 8 VFD	0.48	3.717	-6.701	7.663	3.623	-4.890	6.086	5.804	3.219	6.637	-7.458	-1.345	7.578
REUSE LIFT STATION PUMP	0.48	1.628	-0.274	1.651	0.974	-0.107	0.980	0.237	1.410	1.430	-0.584	-1.380	1.499
ROOF A/C #1	0.48	1.384	-0.273	1.411	0.829	-0.117	0.837	0.237	1.199	1.222	-0.532	-1.164	1.280
S-DEEP WELL 2 LOAD	0.48	2.848	-13.061	13.368	3.085	-13.263	13.617	11.311	2.466	11.577	-12.980	4.266	13.663
S-DEEP WELL 5 LOAD	0.48	3.303	-11.832	12.285	3.594	-11.403	11.956	10.247	2.861	10.639	-12.168	2.629	12.449
S-MCC D1-PNL LD	0.48	4.436	-3.994	5.969	3.609	-2.265	4.261	3.459	3.841	5.169	-4.920	-3.106	5.818
S-MCC D2-PNL LD	0.48	4.418	-3.983	5.949	3.593	-2.260	4.245	3.449	3.826	5.152	-4.904	-3.092	5.797
S-MCC DW1-PNL LDW	0.48	5.737	-5.440	7.906	5.095	-3.124	5.976	4.711	4.968	6.847	-6.853	-3.995	7.932
S-MCC DW2-PNL LDW	0.48	5.737	-5.440	7.906	5.095	-3.124	5.976	4.711	4.968	6.847	-6.853	-3.995	7.932
S-MCC HW1-PNL LHW	0.48	5.752	-8.690	10.421	6.228	-6.323	8.875	7.526	4.981	9.025	-10.523	-2.686	10.860
S-MCC HW2-PNL LHW	0.48	4.899	-9.778	10.936	5.688	-8.062	9.867	8.468	4.243	9.471	-11.433	-0.965	11.474
S-MCCB2-PNL LB1	0.48	5.825	-7.753	9.697	6.070	-5.367	8.103	6.714	5.045	8.398	-9.549	-3.176	10.063
S-MCCB2-PNL P3	0.48	3.989	-10.708	11.427	4.781	-10.056	11.135	9.273	3.455	9.896	-11.981	1.207	12.041
S-MCCB3-PNL LB1	0.48	5.636	-7.492	9.376	5.788	-5.169	7.760	6.489	4.881	8.120	-9.171	-3.072	9.671
S-MCCB3-PNL P3	0.48	3.961	-10.264	11.001	4.671	-9.423	10.517	8.889	3.430	9.528	-11.476	0.849	11.507
S-MCCE1-PNL P4	0.48	4.821	-5.028	6.967	4.089	-2.981	5.060	4.355	4.176	6.033	-6.044	-3.183	6.831
S-MCCE2-PNL P4	0.48	5.054	-6.325	8.096	4.677	-4.073	6.202	5.477	4.377	7.012	-7.509	-2.967	8.074
S-PNL L1-LOAD	0.48	4.500	-10.182	11.132	5.253	-8.619	10.094	8.818	3.897	9.641	-11.593	-0.282	11.596
S-PNL LB1-LOAD	0.48	5.825	-7.753	9.697	6.070	-5.367	8.103	6.714	5.045	8.398	-9.549	-3.176	10.063
S-PNL LD LOAD	0.48	4.418	-3.983	5.949	3.593	-2.260	4.245	3.449	3.826	5.152	-4.904	-3.092	5.797
S-PNL LDW LOAD	0.48	5.737	-5.440	7.906	5.095	-3.124	5.976	4.711	4.968	6.847	-6.853	-3.995	7.932
S-PNL LHW LOAD	0.48	4.899	-9.778	10.936	5.688	-8.062	9.867	8.468	4.243	9.471	-11.433	-0.965	11.474
S-PNL P1-LOAD	0.48	4.500	-10.182	11.132	5.253	-8.619	10.094	8.818	3.897	9.641	-11.593	-0.282	11.596
S-PNL P3-LOAD	0.48	3.989	-10.708	11.427	4.781	-10.056	11.135	9.273	3.455	9.896	-11.981	1.207	12.041
S-PNL P4-LOAD	0.48	5.054	-6.325	8.096	4.677	-4.073	6.202	5.477	4.377	7.012	-7.509	-2.967	8.074
S-SUB1-PNL L1	0.48	4.019	-11.351	12.042	4.864	-10.429	11.508	9.831	3.481	10.429	-12.563	1.252	12.626
S-SUB1-PNL P1	0.48	4.019	-11.351	12.042	4.864	-10.429	11.508	9.831	3.481	10.429	-12.563	1.252	12.626
S-SUB2-PNL L1	0.48	4.500	-10.182	11.132	5.253	-8.619	10.094	8.818	3.897	9.641	-11.593	-0.282	11.596
S-SUB2-PNL P1	0.48	4.500	-10.182	11.132	5.253	-8.619	10.094	8.818	3.897	9.641	-11.593	-0.282	11.596
S-SUB9-DEEP WELL 2	0.48	2.936	-12.664	13.000	3.247	-12.636	13.046	10.967	2.543	11.258	-12.746	3.753	13.287
S-SUB10-DEEP WELL 2	0.48	2.848	-13.061	13.368	3.085	-13.263	13.617	11.311	2.466	11.577	-12.980	4.266	13.663
S-SWBD11-DEEP WELL 5	0.48	3.304	-11.748	12.204	3.594	-11.287	11.845	10.174	2.861	10.569	-12.093	2.556	12.360
S-SWBD12-DEEP WELL 5	0.48	3.303	-11.832	12.285	3.594	-11.403	11.956	10.247	2.861	10.639	-12.168	2.629	12.449
SCUM EJECTOR CP	0.48	0.896	-0.109	0.902	0.529	-0.045	0.531	0.094	0.776	0.781	-0.282	-0.762	0.813



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30 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
SEC CLARIFIERS 3, 4	0.48	0.683	-0.073	0.687	0.402	-0.031	0.403	0.063	0.591	0.595	-0.205	-0.582	0.617
SLUDGE THICKENER DRIVE	0.48	3.445	-1.221	3.655	2.223	-0.493	2.277	1.058	2.983	3.165	-1.869	-2.850	3.408
SLUICE GATE 2	0.48	0.592	-0.048	0.594	0.347	-0.020	0.348	0.042	0.512	0.514	-0.164	-0.506	0.532
SLUICE GATE #4	0.48	0.591	-0.048	0.593	0.347	-0.020	0.347	0.042	0.512	0.514	-0.165	-0.506	0.532
SODIUM BICARBONATE CP	0.48	4.020	-5.662	6.944	3.767	-3.898	5.421	4.904	3.482	6.014	-6.574	-2.055	6.887
SUB 1 BUS A	0.48	2.703	-13.276	13.548	2.833	-13.721	14.010	11.497	2.341	11.733	-12.984	4.757	13.828
SUB1 FEED	4.16	1.905	-15.636	15.751	3.637	-18.316	18.673	13.541	1.650	13.641	-16.937	9.180	19.265
SUB1 LS	0.48	2.703	-13.276	13.548	2.833	-13.721	14.010	11.497	2.341	11.733	-12.984	4.757	13.828
SUB1/SUB9	4.16	1.445	-16.640	16.702	2.011	-21.698	21.791	14.410	1.251	14.465	-16.027	14.333	21.502
SUB 2 BUS B	0.48	2.699	-13.295	13.566	2.830	-13.735	14.023	11.514	2.337	11.749	-13.000	4.765	13.846
SUB2 FEED	4.16	1.813	-15.851	15.955	3.374	-19.006	19.303	13.728	1.571	13.817	-16.958	10.117	19.746
SUB2 LS	0.48	2.699	-13.295	13.566	2.830	-13.735	14.023	11.514	2.337	11.749	-13.000	4.765	13.846
SUB2/SUB10	4.16	1.445	-16.640	16.702	2.011	-21.698	21.791	14.410	1.251	14.465	-16.027	14.333	21.502
SUB 3 BUS A	0.48	2.769	-12.993	13.284	2.879	-13.518	13.821	11.252	2.398	11.505	9.752	9.441	13.574
SUB3 FEED	4.16	2.776	-12.867	13.163	4.683	-11.347	12.275	11.143	2.404	11.400	-14.043	2.393	14.245
SUB3 MAIN LS	0.48	2.769	-12.993	13.284	2.879	-13.518	13.821	11.252	2.398	11.505	9.752	9.441	13.574
SUB 4 BUS B	0.48	2.771	-12.983	13.276	2.881	-13.511	13.815	11.244	2.400	11.497	9.744	9.441	13.568
SUB4 FEED	4.16	2.792	-12.789	13.090	4.676	-11.194	12.132	11.075	2.418	11.336	-13.943	2.286	14.129
SUB4 MAIN LS	0.48	2.771	-12.983	13.276	2.881	-13.511	13.815	11.244	2.400	11.497	9.744	9.441	13.568
SUB 5 BUS A	0.48	2.878	-12.455	12.783	2.961	-13.126	13.456	10.786	2.493	11.071	9.264	9.429	13.218
SUB5 FEED	4.16	3.135	-9.277	9.792	3.647	-6.090	7.099	8.034	2.715	8.480	-9.703	-0.556	9.719
SUB5 MAIN LS	0.48	2.878	-12.455	12.783	2.961	-13.126	13.456	10.786	2.493	11.071	9.264	9.429	13.218
SUB 6 BUS B	0.48	2.882	-12.438	12.767	2.964	-13.113	13.444	10.772	2.496	11.057	9.248	9.428	13.206
SUB6 FEED	4.16	3.134	-9.188	9.708	3.613	-5.994	6.999	7.957	2.714	8.407	-9.602	-0.595	9.620
SUB6 MAIN LS	0.48	2.882	-12.438	12.767	2.964	-13.113	13.444	10.772	2.496	11.057	9.248	9.428	13.206
SUB 7 BUS A	0.48	2.925	-12.192	12.538	2.999	-12.930	13.274	10.558	2.533	10.858	9.024	9.414	13.041
SUB7 FEED	4.16	3.072	-8.057	8.623	3.163	-4.873	5.809	6.978	2.660	7.468	-8.333	-0.987	8.391
SUB7 MAIN LS	0.48	2.925	-12.192	12.538	2.999	-12.930	13.274	10.558	2.533	10.858	9.024	9.414	13.041
SUB7/SUB11	4.16	1.445	-16.640	16.702	2.011	-21.698	21.791	14.410	1.251	14.465	-16.027	14.333	21.502
SUB 8 BUS B	0.48	2.925	-12.192	12.538	2.999	-12.930	13.274	10.558	2.533	10.858	9.024	9.414	13.041
SUB8 FEED	4.16	3.072	-8.057	8.623	3.163	-4.873	5.809	6.978	2.660	7.468	-8.333	-0.987	8.391
SUB8 MAIN LS	0.48	2.925	-12.192	12.538	2.999	-12.930	13.274	10.558	2.533	10.858	9.024	9.414	13.041
SUB8/SUB12	4.16	1.445	-16.640	16.702	2.011	-21.698	21.791	14.410	1.251	14.465	-16.027	14.333	21.502
SUB 9 BUS A	0.48	2.747	-13.459	13.736	2.880	-13.923	14.218	11.656	2.379	11.896	-13.168	4.831	14.026

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30 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
SUB9 FEED	4.16	1.992	-15.424	15.552	3.858	-17.660	18.077	13.358	1.725	13.469	-16.852	8.344	18.804
SUB9 LS	0.48	2.747	-13.459	13.736	2.880	-13.923	14.218	11.656	2.379	11.896	-13.168	4.831	14.026
SUB 10 BUS B	0.48	2.745	-13.469	13.746	2.878	-13.930	14.225	11.664	2.377	11.904	-13.176	4.835	14.035
SUB10 FEED	4.16	1.949	-15.529	15.651	3.753	-17.984	18.371	13.449	1.688	13.554	-16.901	8.750	19.032
SUB10 LS	0.48	2.745	-13.469	13.746	2.878	-13.930	14.225	11.664	2.377	11.904	-13.176	4.835	14.035
SUB11 LS	0.48	3.214	-13.393	13.774	3.378	-13.854	14.260	11.599	2.783	11.928	-13.378	4.390	14.080
SUB12 LS	0.48	3.212	-13.404	13.783	3.377	-13.861	14.267	11.608	2.782	11.937	-13.387	4.393	14.089
SUBNATANT PUMP	0.48	5.376	-6.388	8.349	5.123	-4.124	6.576	5.532	4.656	7.230	-7.792	-3.254	8.444
SUPERANANT PS CP	0.48	3.564	-4.460	5.709	3.089	-2.887	4.228	3.862	3.087	4.944	-5.168	-2.058	5.563
SWBD 11 BUS A	0.48	3.272	-12.007	12.445	3.543	-11.675	12.201	10.399	2.834	10.778	-12.291	2.837	12.614
SWBD11 LS	0.48	3.272	-12.007	12.445	3.543	-11.675	12.201	10.399	2.834	10.778	-12.291	2.837	12.614
SWBD 12 BUS B	0.48	3.270	-12.094	12.529	3.540	-11.798	12.318	10.474	2.832	10.850	-12.366	2.917	12.706
SWBD12 LS	0.48	3.270	-12.094	12.529	3.540	-11.798	12.318	10.474	2.832	10.850	-12.366	2.917	12.706
SWGR BUS A	4.16	1.445	-16.640	16.702	2.011	-21.698	21.791	14.410	1.251	14.465	-16.027	14.333	21.502
SWGR BUS B	4.16	1.445	-16.640	16.702	2.011	-21.698	21.791	14.410	1.251	14.465	-16.027	14.333	21.502
SWGR MAIN 1 LS	4.16	1.445	-16.640	16.702	2.011	-21.698	21.791	14.410	1.251	14.465	-16.027	14.333	21.502
SWGR MAIN 2 LS	4.16	1.445	-16.640	16.702	2.011	-21.698	21.791	14.410	1.251	14.465	-16.027	14.333	21.502
SWITCH 11	4.16	2.033	-15.320	15.454	3.955	-17.345	17.790	13.267	1.761	13.384	-16.791	7.960	18.582
SWITCH 12	4.16	1.992	-15.424	15.552	3.858	-17.660	18.077	13.358	1.725	13.469	-16.852	8.344	18.804
T-AC-1	0.48	1.148	-0.159	1.159	0.684	-0.061	0.686	0.137	0.994	1.003	-0.380	-0.977	1.048
T-BLOWER AB1	4.16	3.794	-6.759	7.751	3.157	-4.085	5.162	5.853	3.286	6.712	-7.134	-1.856	7.371
T-BLOWER AB2	4.16	3.752	-6.880	7.837	3.166	-4.155	5.224	5.959	3.249	6.787	-7.248	-1.797	7.468
T-BLOWER AB3	4.16	3.706	-7.004	7.924	3.175	-4.228	5.287	6.065	3.210	6.862	-7.364	-1.735	7.566
T-BLOWER AB4	4.16	3.675	-7.186	8.071	3.213	-4.353	5.410	6.223	3.182	6.989	-7.547	-1.664	7.728
T-BLOWER AB5	4.16	3.619	-7.313	8.160	3.220	-4.431	5.477	6.334	3.134	7.067	-7.667	-1.591	7.830
T-DEEP WELL PUMP 1	0.48	3.152	-7.633	8.258	3.205	-6.037	6.835	6.610	2.730	7.152	-8.139	-0.267	8.144
T-DEEP WELL PUMP 2	0.48	3.114	-7.338	7.971	3.124	-5.727	6.524	6.355	2.697	6.903	-7.829	-0.381	7.838
T-DEEP WELL PUMP 3	0.48	3.143	-7.560	8.187	3.185	-5.958	6.756	6.547	2.722	7.090	-8.062	-0.298	8.068
T-DEEP WELL PUMP 4	0.48	3.135	-6.957	7.631	3.050	-5.370	6.176	6.025	2.715	6.608	-7.438	-0.556	7.459
T-DEEP WELL PUMP 5	0.48	3.114	-6.827	7.503	3.012	-5.237	6.042	5.912	2.697	6.498	-7.301	-0.599	7.326
T-DEEP WELL PUMP 6	0.48	3.120	-6.858	7.535	3.022	-5.269	6.074	5.940	2.702	6.525	-7.335	-0.590	7.359
T-DP1-WAS PUMP 5	0.48	1.375	-0.263	1.400	0.823	-0.111	0.830	0.227	1.191	1.212	-0.520	-1.158	1.270
T-DP1-WAS PUMP 6	0.48	1.375	-0.263	1.400	0.823	-0.111	0.830	0.227	1.191	1.212	-0.520	-1.158	1.270
T-DP2-WAS PUMP 1	0.48	2.613	-0.929	2.773	1.646	-0.408	1.695	0.804	2.263	2.401	-1.401	-2.142	2.559

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30 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
T-DP2-WAS PUMP 2	0.48	2.613	-0.929	2.773	1.646	-0.408	1.695	0.804	2.263	2.401	-1.401	-2.142	2.559
T-GEN 1	4.16	0.044	-1.323	1.324	0.155	-2.406	2.411	1.421	0.089	1.423	-1.240	1.768	2.160
T-GEN 2	4.16	0.049	-1.474	1.475	0.173	-2.325	2.332	1.573	0.099	1.576	-1.477	1.221	1.916
T-MCC D4-BLOWER 1	0.48	3.467	-4.035	5.320	2.970	-2.555	3.918	3.494	3.002	4.607	-4.739	-2.106	5.186
T-MCC D4-BLOWER 3	0.48	3.640	-4.582	5.852	3.249	-3.010	4.429	3.969	3.152	5.068	-5.365	-2.078	5.753
T-MCC D4-PMP 1	0.48	3.326	-2.651	4.253	2.511	-1.449	2.899	2.296	2.881	3.684	-3.279	-2.410	4.069
T-MCC D4-PMP 3	0.48	3.640	-3.199	4.846	2.872	-1.810	3.394	2.771	3.152	4.197	-3.918	-2.558	4.679
T-MCC D5-BLOWER 2	0.48	3.253	-3.503	4.780	2.675	-2.145	3.429	3.033	2.817	4.140	-4.130	-2.075	4.622
T-MCC D5-BLOWER 4	0.48	3.640	-4.582	5.852	3.249	-3.010	4.429	3.969	3.152	5.068	-5.365	-2.078	5.753
T-MCC D5-PMP 2	0.48	3.046	-2.245	3.784	2.225	-1.199	2.527	1.944	2.638	3.277	-2.803	-2.250	3.594
T-MCC D5-PMP 4	0.48	3.640	-3.199	4.846	2.872	-1.810	3.394	2.771	3.152	4.197	-3.918	-2.558	4.679
T-MCCD1-PNL LD	0.21	0.908	-1.391	1.661	0.928	-1.463	1.732	1.204	0.787	1.438	0.731	1.558	1.721
T-MCCDW1-PNL LDW	0.21	0.962	-1.501	1.783	0.978	-1.564	1.845	1.300	0.833	1.544	0.803	1.649	1.834
T-MCCHW1-PNL LHW 2	0.21	1.003	-1.678	1.955	1.030	-1.728	2.012	1.454	0.869	1.693	0.925	1.759	1.988
T-SUB2-PNL CP	0.21	0.861	-0.956	1.286	0.876	-1.054	1.370	0.828	0.745	1.114	0.386	1.329	1.384
T-SUB11-SWBD11	0.48	3.214	-13.393	13.774	3.378	-13.854	14.260	11.599	2.783	11.928	-13.378	4.390	14.080
T-SUB12-SWBD12	0.48	3.212	-13.404	13.783	3.377	-13.861	14.267	11.608	2.782	11.937	-13.387	4.393	14.089
T-TR-DP1-XLC	0.48	4.308	-5.157	6.719	3.743	-3.235	4.947	4.466	3.730	5.819	-6.040	-2.607	6.579
T-TR-DP4-XLC	0.48	4.357	-5.492	7.010	3.871	-3.520	5.232	4.756	3.773	6.071	-6.406	-2.538	6.890
T-TR-MCC 1-PNL XFMR	0.48	3.851	-3.720	5.355	3.093	-2.170	3.779	3.222	3.335	4.637	-4.470	-2.607	5.175
T-TR-MCC 1-PNL XFMR (2)	0.21	0.540	-0.604	0.811	0.551	-0.619	0.829	0.523	0.468	0.702	0.242	0.785	0.821
T-TR-MCC B1-PNL XFMR	0.48	5.532	-8.217	9.905	5.979	-6.036	8.496	7.116	4.791	8.578	-10.005	-2.584	10.333
T-TR-MCC B1-PNL XFMR2	0.21	0.897	-1.500	1.748	0.918	-1.541	1.794	1.299	0.777	1.514	0.829	1.569	1.774
T-TR-MCC B2-PNL (2)	0.21	1.006	-1.660	1.941	1.032	-1.715	2.002	1.438	0.872	1.681	0.908	1.759	1.979
T-TR-MCC B2-PNL LB1 (2)	0.21	1.026	-1.626	1.923	1.046	-1.691	1.989	1.408	0.889	1.665	0.875	1.770	1.974
T-TR-MCC D1-PNL LD 2	0.48	4.507	-4.528	6.388	3.827	-2.696	4.681	3.921	3.903	5.533	-5.507	-3.006	6.274
T-TR-MCC D1-PNL LD2 (2)	0.21	0.958	-1.513	1.791	0.983	-1.585	1.865	1.311	0.829	1.551	0.807	1.661	1.846
T-TR-MCCB2-PNL LB1	0.48	5.886	-5.540	8.083	5.198	-3.147	6.077	4.798	5.098	7.000	-6.973	-4.124	8.102
T-TR-MCCB2-PNL XFMR	0.48	5.580	-7.316	9.201	5.661	-4.998	7.551	6.336	4.833	7.969	-8.937	-3.089	9.456
T-TR-MCCB4-PNL LP2	0.48	5.652	-8.426	10.146	6.182	-6.221	8.770	7.297	4.895	8.786	-10.306	-2.623	10.634
T-TR-MCCB4-PNL LP2 (2)	0.21	0.551	-0.629	0.837	0.559	-0.636	0.847	0.545	0.478	0.725	-0.828	-0.156	0.843
T-TR-MCCD1-PNL LD	0.48	4.310	-3.528	5.570	3.379	-1.922	3.888	3.055	3.732	4.823	-4.398	-3.120	5.392
T-TR-MCCDW1-PNL LDW	0.48	5.576	-4.646	7.257	4.662	-2.493	5.286	4.023	4.829	6.285	-5.921	-4.077	7.189
T-TR-MCCHW1-PNL LHW	0.48	5.556	-8.372	10.048	5.912	-6.053	8.461	7.250	4.812	8.702	-10.066	-2.608	10.398

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30 Cycle - 3-Phase, LG, LL, & LLG Fault Currents

Prefault Voltage = 100 % of the Bus Nominal Voltage

Bus		3-Phase Fault			Line-to-Ground Fault			Line-to-Line Fault			*Line-to-Line-to-Ground		
ID	kV	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.	Real	Imag.	Mag.
T-TR-SUB1/2-PNL L1 XFMR	0.48	4.654	-9.636	10.701	5.293	-7.856	9.473	8.345	4.031	9.267	-11.058	-0.840	11.090
T-TR-SUB1/2-PNL L1 XFMR 2	0.21	2.014	-3.513	4.050	2.145	-3.707	4.283	3.043	1.744	3.507	-4.190	0.218	4.196
T-TR-SUB2-PNL CP XFMR	0.48	2.026	-0.576	2.106	1.243	-0.250	1.268	0.499	1.754	1.824	-0.946	-1.680	1.928
T-TR-SUB2-PNL CP XFMR 2	0.21	0.865	-0.984	1.311	0.877	-1.111	1.416	0.853	0.749	1.135	0.415	1.379	1.441
T-TR-T7A-PRI	4.16	3.245	-7.471	8.145	3.086	-4.527	5.479	6.470	2.810	7.054	-7.770	-1.242	7.868
T-TR-T7A-SEC	0.48	2.751	-11.148	11.482	2.794	-11.804	12.130	9.654	2.383	9.944	8.241	8.653	11.949
T-TR-T8A-PRI	4.16	3.245	-7.471	8.145	3.086	-4.527	5.479	6.470	2.810	7.054	-7.770	-1.242	7.868
T-TR-T8A-SEC	0.48	2.751	-11.148	11.482	2.794	-11.804	12.130	9.654	2.383	9.944	8.241	8.653	11.949
THICK WAS 3 AFD	0.48	3.702	-10.798	11.415	4.359	-10.304	11.188	9.351	3.206	9.885	-11.810	1.669	11.927
THICK WAS 4 AFD	0.48	3.702	-10.798	11.415	4.359	-10.304	11.188	9.351	3.206	9.885	-11.810	1.669	11.927
VALVE OPERATOR	0.48	4.433	-2.099	4.905	3.044	-0.894	3.173	1.817	3.839	4.248	-2.954	-3.595	4.653
WATER HEATER	0.48	5.365	-8.105	9.720	5.836	-6.052	8.408	7.019	4.647	8.418	-9.865	-2.402	10.153

All fault currents are symmetrical momentary (30 Cycle network) values in rms kA

\* LLG fault current is the larger of the two faulted line currents

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**Short-Circuit Summary Report**

Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
54" METER VAULT VALVE	0.480	0.29353	0.03756	0.29593	0.29353	0.03756	0.29593	0.91560	0.06113	0.91764
A/C ROOF UNIT #2	0.480	0.04457	0.02730	0.05227	0.04457	0.02730	0.05227	0.13143	0.03594	0.13625
ABFV-1	0.480	0.05222	0.03619	0.06354	0.05222	0.03619	0.06354	0.15291	0.05504	0.16251
ABFV-2	0.480	0.06222	0.03653	0.07216	0.06222	0.03653	0.07216	0.18441	0.05588	0.19269
ABFV-3	0.480	0.07222	0.03687	0.08109	0.07222	0.03687	0.08109	0.21591	0.05671	0.22323
ABFV-4	0.480	0.08222	0.03721	0.09025	0.08222	0.03721	0.09025	0.24741	0.05755	0.25401
ABFV-5	0.480	0.09222	0.03755	0.09958	0.09222	0.03755	0.09958	0.27891	0.05838	0.28495
ABW #1 EFF. WEIR GATE	0.480	0.29353	0.03756	0.29593	0.29353	0.03756	0.29593	0.91560	0.06113	0.91764
ABW #1 FESTON SYSTEM	0.480	0.11823	0.03716	0.12393	0.11823	0.03716	0.12393	0.36341	0.06014	0.36835
ABW #1 INF. WEIR GATE	0.480	0.28153	0.03693	0.28394	0.28153	0.03693	0.28394	0.87780	0.05958	0.87982
ABW #1 SLUICE GATE #1	0.480	0.46537	0.03782	0.46690	0.46537	0.03782	0.46690	1.45695	0.06182	1.45826
ABW #3 FESTON SYSTEM	0.480	0.12297	0.03754	0.12857	0.12297	0.03754	0.12857	0.37839	0.06113	0.38329
ABW #3,4,5 FESTON SYSTEM	0.480	0.20817	0.03908	0.21181	0.20817	0.03908	0.21181	0.64677	0.06492	0.65002
ABW 3,4,5 FLOCCULATOR	0.480	0.48537	0.03850	0.48689	0.48537	0.03850	0.48689	1.51995	0.06349	1.52127
ABW #3,4,6 FESTON SYSTEM	0.480	0.20053	0.03869	0.20423	0.20053	0.03869	0.20423	0.62265	0.06391	0.62592
ABW #3,4,6 SLUICE GATE	0.480	0.31753	0.03882	0.31990	0.31753	0.03882	0.31990	0.99120	0.06423	0.99328
ABW #5 SLUICE GATE	0.480	0.29353	0.03756	0.29593	0.29353	0.03756	0.29593	0.91560	0.06113	0.91764
ABW #6 FESTON SYSTEM	0.480	0.12313	0.03780	0.12880	0.12313	0.03780	0.12880	0.37884	0.06172	0.38384
ABW #6 SLUICE GATE	0.480	0.30553	0.03819	0.30791	0.30553	0.03819	0.30791	0.95340	0.06268	0.95546
ABW 6,7 FLASH MIXER #3	0.480	0.34137	0.03982	0.34368	0.34137	0.03982	0.34368	1.06635	0.06674	1.06843
ABW #7 FESTON SYSTEM	0.480	0.13767	0.03946	0.14321	0.13767	0.03946	0.14321	0.42469	0.06585	0.42977
ABW FILTER #2	0.480	0.12787	0.03818	0.13345	0.12787	0.03818	0.13345	0.39382	0.06270	0.39878
ABW SLUICE GATE	0.480	0.48537	0.03850	0.48689	0.48537	0.03850	0.48689	1.51995	0.06349	1.52127
ACU-1	0.480	0.02842	0.03637	0.04616	0.02842	0.03637	0.04616	0.07794	0.05548	0.09567
AFD-MCC D1-THICKENER	0.480	0.03110	0.02980	0.04307	0.03110	0.02980	0.04307	0.08557	0.03846	0.09382
AIR COMPRESSOR	0.480	0.02342	0.02386	0.03344	0.02342	0.02386	0.03344	0.06219	0.02470	0.06692
AIR COMPRESSOR 2	0.480	0.02537	0.02402	0.03494	0.02537	0.02402	0.03494	0.06833	0.02510	0.07280
BASIN 1 ADFV 13	0.480	0.09547	0.02660	0.09910	0.09547	0.02660	0.09910	0.28918	0.03150	0.29089
BASIN 2 ADFV 14	0.480	0.11947	0.02786	0.12267	0.11947	0.02786	0.12267	0.36478	0.03460	0.36642
BASIN 3 ADFV 15	0.480	0.15247	0.02959	0.15531	0.15247	0.02959	0.15531	0.46873	0.03886	0.47034
BASIN 4 ADFV 16	0.480	0.18547	0.03132	0.18809	0.18547	0.03132	0.18809	0.57268	0.04312	0.57430
BELT FILTER PRESS 1	0.480	0.03779	0.02665	0.04624	0.03779	0.02665	0.04624	0.10662	0.03072	0.11096
BELT FILTER PRESS 2	0.480	0.03779	0.02665	0.04624	0.03779	0.02665	0.04624	0.10662	0.03072	0.11096
BELT FILTER PRESS 3	0.480	0.03044	0.02569	0.03983	0.03044	0.02569	0.03983	0.08347	0.02836	0.08815
BELT FILTER PRESS 4	0.480	0.03044	0.02569	0.03983	0.03044	0.02569	0.03983	0.08347	0.02836	0.08815

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
BELT FILTER PRESS 5	0.480	0.02309	0.02473	0.03383	0.02309	0.02473	0.03383	0.06032	0.02600	0.06568
BELT FILTER PRESS 6	0.480	0.02309	0.02473	0.03383	0.02309	0.02473	0.03383	0.06032	0.02600	0.06568
BLOWER #6 INLET VALVE	0.480	0.02259	0.03518	0.04181	0.02259	0.03518	0.04181	0.05956	0.05256	0.07943
BLOWER A LS	4.160	0.09589	0.25576	0.27315	0.09589	0.25576	0.27315	0.45869	0.50147	0.67961
BLOWER B LS	4.160	0.09723	0.25756	0.27530	0.09723	0.25756	0.27530	0.46594	0.50881	0.68992
BLOWER BUS A	4.160	0.09589	0.25576	0.27315	0.09589	0.25576	0.27315	0.45869	0.50147	0.67961
BLOWER BUS B	4.160	0.09723	0.25756	0.27530	0.09723	0.25756	0.27530	0.46594	0.50881	0.68992
CLARIFIER 1 CP	0.480	0.18217	0.03958	0.18642	0.18217	0.03958	0.18642	0.56482	0.06610	0.56867
CLARIFIER 2 CP	0.480	0.18057	0.03916	0.18477	0.18057	0.03916	0.18477	0.55983	0.06511	0.56360
CLARIFIER 5 CP	0.480	0.18244	0.03984	0.18674	0.18244	0.03984	0.18674	0.56567	0.06674	0.56959
CONVEYOR CP	0.480	0.05274	0.02639	0.05897	0.05274	0.02639	0.05897	0.15371	0.03008	0.15663
D-DP1-RAS PUMP 7	0.480	0.02994	0.03402	0.04532	0.02994	0.03402	0.04532	0.08529	0.05242	0.10011
D-DP1-RAS PUMP 8	0.480	0.02994	0.03402	0.04532	0.02994	0.03402	0.04532	0.08529	0.05242	0.10011
D-DP1-WAS 5	0.480	0.03444	0.03170	0.04681	0.03444	0.03170	0.04681	0.09947	0.04671	0.10989
D-DP1-WAS 6	0.480	0.03444	0.03170	0.04681	0.03444	0.03170	0.04681	0.09947	0.04671	0.10989
D-DP2-RAS PUMP 1	0.480	0.03897	0.03556	0.05276	0.03897	0.03556	0.05276	0.11374	0.05621	0.12687
D-DP2-RAS PUMP 3	0.480	0.03897	0.03556	0.05276	0.03897	0.03556	0.05276	0.11374	0.05621	0.12687
D-DP2-WAS 1	0.480	0.03417	0.03144	0.04644	0.03417	0.03144	0.04644	0.09862	0.04607	0.10885
D-DP2-WAS 2	0.480	0.03417	0.03144	0.04644	0.03417	0.03144	0.04644	0.09862	0.04607	0.10885
D-DP4-RAS PUMP 2	0.480	0.02497	0.03274	0.04117	0.02497	0.03274	0.04117	0.06969	0.04932	0.08537
D-DP4-WAS 2	0.480	0.03257	0.03102	0.04498	0.03257	0.03102	0.04498	0.09363	0.04509	0.10392
D-DP4-WAS PUMP 2	0.480	0.09257	0.03306	0.09829	0.09257	0.03306	0.09829	0.28263	0.05011	0.28703
D-MCC 1-EXHAUST 1	0.480	0.09222	0.03755	0.09958	0.09222	0.03755	0.09958	0.27891	0.05838	0.28495
D-MCC 1-EXHAUST 2	0.480	0.09222	0.03755	0.09958	0.09222	0.03755	0.09958	0.27891	0.05838	0.28495
D-MCC 1-EXHAUST 3	0.480	0.09222	0.03755	0.09958	0.09222	0.03755	0.09958	0.27891	0.05838	0.28495
D-MCC 1-EXHAUST 4	0.480	0.09222	0.03755	0.09958	0.09222	0.03755	0.09958	0.27891	0.05838	0.28495
D-MCC B1-AIR BLOWER	0.480	0.01387	0.02468	0.02831	0.01387	0.02468	0.02831	0.03211	0.02671	0.04177
D-MCC B1-DAF THICK 2	0.480	0.09087	0.02529	0.09433	0.09087	0.02529	0.09433	0.27466	0.02821	0.27610
D-MCC B1-EAST DAF RECYC	0.480	0.01487	0.02496	0.02906	0.01487	0.02496	0.02906	0.03526	0.02741	0.04466
D-MCC B1-PRESSURIZATION	0.480	0.02187	0.02696	0.03471	0.02187	0.02696	0.03471	0.05731	0.03232	0.06579
D-MCC B1-THICK WAS 3	0.480	0.01987	0.02639	0.03303	0.01987	0.02639	0.03303	0.05101	0.03092	0.05965
D-MCC B1-THICK WAS 4	0.480	0.01987	0.02639	0.03303	0.01987	0.02639	0.03303	0.05101	0.03092	0.05965
D-MCC B1-WEST DAF RECYC	0.480	0.01487	0.02496	0.02906	0.01487	0.02496	0.02906	0.03526	0.02741	0.04466
D-MCC B2-AIR COMPRESSOR	0.480	0.03487	0.02571	0.04332	0.03487	0.02571	0.04332	0.09829	0.02932	0.10257
D-MCC B2-EQ DIVERSION VLV	0.480	0.09547	0.02493	0.09867	0.09547	0.02493	0.09867	0.28918	0.02740	0.29047
D-MCC B2-RETURN SLUDGE	0.480	0.06007	0.02642	0.06562	0.06007	0.02642	0.06562	0.17767	0.03107	0.18036

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
D-MCC B2-RETURN SLUDGE 2	0.480	0.04447	0.02512	0.05107	0.04447	0.02512	0.05107	0.12853	0.02787	0.13152
D-MCC B2-RETURN SLUDGE 3	0.480	0.05227	0.02577	0.05827	0.05227	0.02577	0.05827	0.15310	0.02947	0.15591
D-MCC B2-RETURN SLUDGE 4	0.480	0.05227	0.02577	0.05827	0.05227	0.02577	0.05827	0.15310	0.02947	0.15591
D-MCC B2-RETURN SLUDGE 5	0.480	0.06007	0.02642	0.06562	0.06007	0.02642	0.06562	0.17767	0.03107	0.18036
D-MCC B3-STANDBY PRESSURE	0.480	0.01807	0.02607	0.03172	0.01807	0.02607	0.03172	0.04532	0.03013	0.05442
D-MCC D1-BFP FEED PUMP	0.480	0.07110	0.03227	0.07808	0.07110	0.03227	0.07808	0.21157	0.04453	0.21621
D-MCC D1-BFP FEED PUMP5	0.480	0.06570	0.03367	0.07383	0.06570	0.03367	0.07383	0.19456	0.04798	0.20039
D-MCC D1-GRAVITY THICK	0.480	0.15110	0.03388	0.15486	0.15110	0.03388	0.15486	0.46357	0.04850	0.46610
D-MCC D1-SLUDGE RECIRC 1	0.480	0.03560	0.03232	0.04808	0.03560	0.03232	0.04808	0.09975	0.04466	0.10929
D-MCC D1-SLUDGE RECIRC 3	0.480	0.04050	0.03296	0.05222	0.04050	0.03296	0.05222	0.11518	0.04623	0.12411
D-MCC D1-SLUDGE RECIRC 4	0.480	0.04540	0.03360	0.05648	0.04540	0.03360	0.05648	0.13062	0.04781	0.13909
D-MCC D1-SLUDGE TRANSFER1	0.480	0.03070	0.03168	0.04412	0.03070	0.03168	0.04412	0.08431	0.04308	0.09468
D-MCC D1-THICKENER	0.480	0.15110	0.03388	0.15486	0.15110	0.03388	0.15486	0.46357	0.04850	0.46610
D-MCC D2-BFP FEED PUMP1	0.480	0.05320	0.03145	0.06180	0.05320	0.03145	0.06180	0.15518	0.04252	0.16090
D-MCC D2-BFP FEED PUMP4	0.480	0.07720	0.03271	0.08384	0.07720	0.03271	0.08384	0.23078	0.04562	0.23524
D-MCC D2-BFP FEED PUMP6	0.480	0.08920	0.03334	0.09523	0.08920	0.03334	0.09523	0.26858	0.04717	0.27269
D-MCC D2-SLUDGE RECIRC 2	0.480	0.05410	0.03282	0.06328	0.05410	0.03282	0.06328	0.15801	0.04589	0.16454
D-MCC D2-SLUDGE TRANSFER2	0.480	0.14320	0.03617	0.14770	0.14320	0.03617	0.14770	0.43868	0.05414	0.44201
D-MCC D2-SLUDGE TRANSFER3	0.480	0.06190	0.03347	0.07037	0.06190	0.03347	0.07037	0.18258	0.04749	0.18866
D-MCC D2-SLUDGE TRANSFER4	0.480	0.03060	0.03074	0.04338	0.03060	0.03074	0.04338	0.08400	0.04078	0.09337
D-MCC DW1-PLANT DRAIN1	0.480	0.12394	0.03278	0.12820	0.12394	0.03278	0.12820	0.37799	0.04580	0.38076
D-MCC DW1-PLANT DRAIN2	0.480	0.12394	0.03278	0.12820	0.12394	0.03278	0.12820	0.37799	0.04580	0.38076
D-MCC DW1-PLANT DRAIN3	0.480	0.12394	0.03278	0.12820	0.12394	0.03278	0.12820	0.37799	0.04580	0.38076
D-MCC E1-EF-7	0.480	0.10153	0.02748	0.10519	0.10153	0.02748	0.10519	0.31080	0.03633	0.31292
D-MCC E1-FLASH MIXER 1	0.480	0.54553	0.04080	0.54706	0.54553	0.04080	0.54706	1.70940	0.06910	1.71080
D-MCC E1-FLASH MIXER 2	0.480	0.31753	0.03882	0.31990	0.31753	0.03882	0.31990	0.99120	0.06423	0.99328
D-MCC E2-EF-5.1	0.480	0.16537	0.02762	0.16766	0.16537	0.02762	0.16766	0.51195	0.03672	0.51326
D-MCC E2-EF-5.2	0.480	0.16537	0.02762	0.16766	0.16537	0.02762	0.16766	0.51195	0.03672	0.51326
D-MCC HW1-CONVEYOR EAST	0.480	0.06493	0.02451	0.06940	0.06493	0.02451	0.06940	0.19466	0.02814	0.19669
D-MCC HW1-FINAL CLAR. 3	0.480	1.04343	0.04582	1.04443	1.04343	0.04582	1.04443	3.27694	0.08055	3.27793
D-MCC HW1-FINAL CLAR. 4	0.480	1.02793	0.04545	1.02893	1.02793	0.04545	1.02893	3.22811	0.07965	3.22909
D-MCC HW1-GRIT CLASS WEST	0.480	0.22493	0.02884	0.22677	0.22493	0.02884	0.22677	0.69866	0.03879	0.69974
D-MCC HW1-PRI. SLUDGE	0.480	0.72493	0.04584	0.72638	0.72493	0.04584	0.72638	2.27366	0.08061	2.27509

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
D-MCC HW1-RSP 4	0.480	0.05693	0.03618	0.06745	0.05693	0.03618	0.06745	0.16946	0.05685	0.17874
D-MCC HW1-RSP 5	0.480	0.05693	0.03618	0.06745	0.05693	0.03618	0.06745	0.16946	0.05685	0.17874
D-MCC HW1-WEST CONVEYOR	0.480	0.23493	0.02918	0.23673	0.23493	0.02918	0.23673	0.73016	0.03963	0.73124
D-MCC HW2-GRIT CLASS 2	0.480	0.14523	0.02662	0.14765	0.14523	0.02662	0.14765	0.44758	0.03328	0.44881
D-MCC HW2-GRIT PUMP 2	0.480	0.07723	0.02564	0.08137	0.07723	0.02564	0.08137	0.23338	0.03087	0.23541
D-MCC HW2-PRI. SLUDGE 1	0.480	0.52523	0.03954	0.52671	0.52523	0.03954	0.52671	1.64458	0.06506	1.64586
D-MCC HW2-PRI. SLUDGE 3	0.480	0.52523	0.03954	0.52671	0.52523	0.03954	0.52671	1.64458	0.06506	1.64586
D-MCC HW2-RSP 6	0.480	0.05723	0.03668	0.06797	0.05723	0.03668	0.06797	0.17038	0.05803	0.17999
D-MCC HW2-WAS PUMP 3	0.480	0.32923	0.03887	0.33151	0.32923	0.03887	0.33151	1.02718	0.06342	1.02913
D-MCC HW2-WAS PUMP 4	0.480	0.32923	0.03887	0.33151	0.32923	0.03887	0.33151	1.02718	0.06342	1.02913
D-MCCB4-SUBM PUMP START	0.480	0.12247	0.03162	0.12648	0.12247	0.03162	0.12648	0.37423	0.04386	0.37679
DAF THICKENER 2 AFD	0.480	0.03087	0.02325	0.03865	0.03087	0.02325	0.03865	0.08566	0.02319	0.08874
DAVIS SCRUBBER	0.480	0.02123	0.02642	0.03389	0.02123	0.02642	0.03389	0.05698	0.03279	0.06574
DEEP WELL PUMP 1 VFD	0.480	0.00462	0.02052	0.02103	0.00462	0.02052	0.02103	0.00561	0.01957	0.02036
DEEP WELL PUMP 2 VFD	0.480	0.00520	0.02126	0.02188	0.00520	0.02126	0.02188	0.00746	0.02142	0.02268
DEEP WELL PUMP 3 VFD	0.480	0.00442	0.02026	0.02073	0.00442	0.02026	0.02073	0.00500	0.01896	0.01961
DEEP WELL PUMP 4 VFD	0.480	0.00634	0.02211	0.02300	0.00634	0.02211	0.02300	0.00961	0.02377	0.02564
DEEP WELL PUMP 5 VFD	0.480	0.00655	0.02235	0.02329	0.00655	0.02235	0.02329	0.01031	0.02440	0.02649
DEEP WELL PUMP 6 VFD	0.480	0.00626	0.02198	0.02285	0.00626	0.02198	0.02285	0.00938	0.02348	0.02528
DEGRITTER CP	0.480	0.08923	0.02627	0.09301	0.08923	0.02627	0.09301	0.27118	0.03242	0.27311
DP1 MAIN LS	0.480	0.01444	0.03102	0.03422	0.01444	0.03102	0.03422	0.03647	0.04504	0.05795
DP2 MAIN LS	0.480	0.01417	0.03076	0.03387	0.01417	0.03076	0.03387	0.03562	0.04440	0.05692
DP4 MAIN LS	0.480	0.01257	0.03034	0.03284	0.01257	0.03034	0.03284	0.03063	0.04342	0.05313
EFF. FILTER PS CNTRL	0.480	0.01482	0.02983	0.03331	0.01482	0.02983	0.03331	0.03771	0.04216	0.05657
ELECTRIC ROLL-UP DOOR	0.480	0.07222	0.03687	0.08109	0.07222	0.03687	0.08109	0.21591	0.05671	0.22323
EQ TANK RETURN	0.480	0.10547	0.02527	0.10845	0.10547	0.02527	0.10845	0.32068	0.02824	0.32192
FPL PRIMARY	23.000	1.20028	10.30342	10.37310	1.20028	10.30342	10.37310			
FPL SERVICE	4.160	0.01190	0.14285	0.14335	0.01190	0.14285	0.14335	0.00391	0.04097	0.04116
HOIST	0.480	0.03247	0.02329	0.03996	0.03247	0.02329	0.03996	0.09073	0.02336	0.09369
LIGHTING PANEL	0.208	0.04695	0.05994	0.07614	0.04695	0.05994	0.07614	0.06917	0.05701	0.08963
LTG. PNL	0.208	0.03407	0.05347	0.06340	0.03407	0.05347	0.06340	0.03494	0.04981	0.06084
MAIN GATE CP	0.480	0.36493	0.04026	0.36714	0.36493	0.04026	0.36714	1.13966	0.06688	1.14162
MCC 1	0.480	0.02222	0.03517	0.04160	0.02222	0.03517	0.04160	0.05841	0.05253	0.07856
MCC B1	0.480	0.00587	0.02240	0.02315	0.00587	0.02240	0.02315	0.00691	0.02110	0.02221
MCC B2	0.480	0.00547	0.02187	0.02254	0.00547	0.02187	0.02254	0.00568	0.01987	0.02067
MCC B3	0.480	0.00607	0.02265	0.02345	0.00607	0.02265	0.02345	0.00752	0.02172	0.02298



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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
MCC B4	0.480	0.00547	0.02187	0.02254	0.00547	0.02187	0.02254	0.00568	0.01987	0.02067
MCC D1	0.480	0.01110	0.02912	0.03116	0.01110	0.02912	0.03116	0.02257	0.03679	0.04316
MCC D2	0.480	0.01120	0.02924	0.03132	0.01120	0.02924	0.03132	0.02288	0.03709	0.04358
MCC D4 LS	0.480	0.00695	0.02493	0.02588	0.00695	0.02493	0.02588	0.00790	0.02352	0.02481
MCC D5 LS	0.480	0.00695	0.02493	0.02588	0.00695	0.02493	0.02588	0.00790	0.02352	0.02481
MCC DW1	0.480	0.00594	0.02249	0.02326	0.00594	0.02249	0.02326	0.00629	0.02049	0.02143
MCC DW2	0.480	0.00594	0.02249	0.02326	0.00594	0.02249	0.02326	0.00629	0.02049	0.02143
MCC E1	0.480	0.00553	0.02244	0.02312	0.00553	0.02244	0.02312	0.00840	0.02393	0.02536
MCC E2	0.480	0.00537	0.02218	0.02282	0.00537	0.02218	0.02282	0.00795	0.02334	0.02466
MCC HW 1	0.480	0.00493	0.02136	0.02192	0.00493	0.02136	0.02192	0.00566	0.02039	0.02116
MCC HW 2	0.480	0.00523	0.02186	0.02247	0.00523	0.02186	0.02247	0.00658	0.02157	0.02255
MCC-D4	0.480	0.00695	0.02493	0.02588	0.00695	0.02493	0.02588	0.00790	0.02352	0.02481
MCC-D5	0.480	0.00695	0.02493	0.02588	0.00695	0.02493	0.02588	0.00790	0.02352	0.02481
MCC1 LS	0.480	0.02222	0.03517	0.04160	0.02222	0.03517	0.04160	0.05841	0.05253	0.07856
MCCB1 LS	0.480	0.00587	0.02240	0.02315	0.00587	0.02240	0.02315	0.00691	0.02110	0.02221
MCCD1 LS	0.480	0.01110	0.02912	0.03116	0.01110	0.02912	0.03116	0.02257	0.03679	0.04316
MCCD2 LS	0.480	0.01120	0.02924	0.03132	0.01120	0.02924	0.03132	0.02288	0.03709	0.04358
MECH SCREEN CP	0.480	0.10493	0.02476	0.10781	0.10493	0.02476	0.10781	0.32066	0.02875	0.32195
MOV RATE OF FLOW	0.480	0.31737	0.03856	0.31970	0.31737	0.03856	0.31970	0.99075	0.06364	0.99279
MTS-AC1-LOAD	0.480	0.15695	0.03003	0.15980	0.15695	0.03003	0.15980	0.48040	0.03607	0.48176
MTS-MCC D4 LINE	0.480	0.15695	0.03003	0.15980	0.15695	0.03003	0.15980	0.48040	0.03607	0.48176
MTS-MCC D5-LINE	0.480	0.15695	0.03003	0.15980	0.15695	0.03003	0.15980	0.48040	0.03607	0.48176
NEW MAINT. BLDG	0.480	0.01866	0.03449	0.03922	0.01866	0.03449	0.03922	0.04636	0.05001	0.06819
OLD MAINTENANCE BLDG	0.480	0.04794	0.03446	0.05904	0.04794	0.03446	0.05904	0.13859	0.04993	0.14731
PLANT DRAIN #3	0.480	0.00694	0.02303	0.02406	0.00694	0.02303	0.02406	0.00944	0.02182	0.02377
PLANT DRAIN PS CTL PNL	0.480	0.01797	0.03238	0.03703	0.01797	0.03238	0.03703	0.04764	0.04843	0.06793
PMS-7A LS	4.160	0.10781	0.26506	0.28615	0.10781	0.26506	0.28615	0.49043	0.53206	0.72361
PMS-8A LS	4.160	0.10781	0.26506	0.28615	0.10781	0.26506	0.28615	0.49043	0.53206	0.72361
PNL CP	0.208	0.06449	0.06996	0.09515	0.06449	0.06996	0.09515	0.04932	0.06486	0.08148
PNL DP #1	0.480	0.01444	0.03102	0.03422	0.01444	0.03102	0.03422	0.03647	0.04504	0.05795
PNL DP #2	0.480	0.01417	0.03076	0.03387	0.01417	0.03076	0.03387	0.03562	0.04440	0.05692
PNL DP #4	0.480	0.01257	0.03034	0.03284	0.01257	0.03034	0.03284	0.03063	0.04342	0.05313
PNL L1	0.208	0.02825	0.03873	0.04793	0.02825	0.03873	0.04793	0.05516	0.05333	0.07672
PNL LB1	0.208	0.03533	0.05339	0.06402	0.03533	0.05339	0.06402	0.03494	0.04981	0.06084
PNL LC1/LC2	0.208	0.03897	0.05411	0.06668	0.03897	0.05411	0.06668	0.05038	0.05138	0.07196
PNL LD	0.208	0.04054	0.06081	0.07309	0.04054	0.06081	0.07309	0.03546	0.05531	0.06570
PNL LD 2	0.208	0.03786	0.05723	0.06862	0.03786	0.05723	0.06862	0.03641	0.05229	0.06372

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
PNL LDW	0.208	0.03735	0.05700	0.06815	0.03735	0.05700	0.06815	0.03399	0.05283	0.06282
PNL LHW	0.208	0.03251	0.05300	0.06218	0.03251	0.05300	0.06218	0.03179	0.04911	0.05850
PNL LP1	0.208	0.10184	0.11103	0.15066	0.10184	0.11103	0.15066	0.10151	0.10515	0.14616
PNL LP2	0.208	0.09951	0.10858	0.14728	0.09951	0.10858	0.14728	0.10718	0.10525	0.15022
PNL P3	0.480	0.01047	0.02330	0.02554	0.01047	0.02330	0.02554	0.02143	0.02338	0.03171
PNL PC/TC-2	0.208	0.03496	0.05332	0.06376	0.03496	0.05332	0.06376	0.03951	0.04989	0.06364
PNL PC/TC-3	0.208	0.04023	0.05403	0.06736	0.04023	0.05403	0.06736	0.05038	0.05138	0.07196
PNL PC/TC-4	0.208	0.04225	0.05764	0.07147	0.04225	0.05764	0.07147	0.04943	0.05440	0.07351
PNL XLC	0.208	0.10852	0.18094	0.21099	0.10852	0.18094	0.21099	0.10355	0.17500	0.20334
PNL XLC (2)	0.208	0.10816	0.18081	0.21070	0.10816	0.18081	0.21070	0.10355	0.17500	0.20334
PNL-P1	0.480	0.04006	0.03652	0.05421	0.04006	0.03652	0.05421	0.11724	0.05862	0.13107
PNL-P4	0.480	0.02437	0.02759	0.03681	0.02437	0.02759	0.03681	0.06780	0.03666	0.07707
POLYMER FEED 5, 6	0.480	0.10194	0.02753	0.10559	0.10194	0.02753	0.10559	0.30869	0.03289	0.31044
POLYMER FEED CP	0.480	0.11394	0.02816	0.11737	0.11394	0.02816	0.11737	0.34649	0.03444	0.34820
POLYMER MIX CP	0.480	0.11394	0.02816	0.11737	0.11394	0.02816	0.11737	0.34649	0.03444	0.34820
RAS 1 VFD	0.480	0.01727	0.03136	0.03580	0.01727	0.03136	0.03580	0.04538	0.04588	0.06453
RAS 2 VFD	0.480	0.01567	0.03094	0.03468	0.01567	0.03094	0.03468	0.04039	0.04489	0.06039
RAS 3 VFD	0.480	0.01727	0.03136	0.03580	0.01727	0.03136	0.03580	0.04538	0.04588	0.06453
RAS 7 VFD	0.480	0.01754	0.03162	0.03616	0.01754	0.03162	0.03616	0.04623	0.04652	0.06558
RAS 8 VFD	0.480	0.01754	0.03162	0.03616	0.01754	0.03162	0.03616	0.04623	0.04652	0.06558
REUSE LIFT STATION PUMP	0.480	0.16553	0.02788	0.16786	0.16553	0.02788	0.16786	0.51240	0.03731	0.51376
ROOF A/C #1	0.480	0.19273	0.03804	0.19645	0.19273	0.03804	0.19645	0.59808	0.06231	0.60132
S-DEEP WELL 2 LOAD	0.480	0.00442	0.02026	0.02073	0.00442	0.02026	0.02073	0.00500	0.01896	0.01961
S-DEEP WELL 5 LOAD	0.480	0.00607	0.02173	0.02256	0.00607	0.02173	0.02256	0.00877	0.02286	0.02449
S-MCC D1-PNL LD	0.480	0.03450	0.03107	0.04643	0.03450	0.03107	0.04643	0.09628	0.04158	0.10488
S-MCC D2-PNL LD	0.480	0.03460	0.03119	0.04659	0.03460	0.03119	0.04659	0.09659	0.04189	0.10528
S-MCC DW1-PNL LDW	0.480	0.02544	0.02412	0.03505	0.02544	0.02412	0.03505	0.06772	0.02449	0.07201
S-MCC DW2-PNL LDW	0.480	0.02544	0.02412	0.03505	0.02544	0.02412	0.03505	0.06772	0.02449	0.07201
S-MCC HW1-PNL LHW	0.480	0.01468	0.02218	0.02659	0.01468	0.02218	0.02659	0.03638	0.02239	0.04271
S-MCC HW2-PNL LHW	0.480	0.01135	0.02266	0.02534	0.01135	0.02266	0.02534	0.02587	0.02354	0.03498
S-MCCB2-PNL LB1	0.480	0.01717	0.02285	0.02858	0.01717	0.02285	0.02858	0.04253	0.02227	0.04801
S-MCCB2-PNL P3	0.480	0.00847	0.02273	0.02425	0.00847	0.02273	0.02425	0.01513	0.02198	0.02668
S-MCCB3-PNL LB1	0.480	0.01777	0.02362	0.02956	0.01777	0.02362	0.02956	0.04438	0.02412	0.05051
S-MCCB3-PNL P3	0.480	0.00907	0.02350	0.02519	0.00907	0.02350	0.02519	0.01697	0.02382	0.02925
S-MCCE1-PNL P4	0.480	0.02753	0.02871	0.03978	0.02753	0.02871	0.03978	0.07770	0.03936	0.08710
S-MCCE2-PNL P4	0.480	0.02137	0.02674	0.03423	0.02137	0.02674	0.03423	0.05835	0.03456	0.06781
S-PNL L1-LOAD	0.480	0.01006	0.02277	0.02489	0.01006	0.02277	0.02489	0.02274	0.02479	0.03364

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
S-PNL LB1-LOAD	0.480	0.01717	0.02285	0.02858	0.01717	0.02285	0.02858	0.04253	0.02227	0.04801
S-PNL LD LOAD	0.480	0.03460	0.03119	0.04659	0.03460	0.03119	0.04659	0.09659	0.04189	0.10528
S-PNL LDW LOAD	0.480	0.02544	0.02412	0.03505	0.02544	0.02412	0.03505	0.06772	0.02449	0.07201
S-PNL LHW LOAD	0.480	0.01135	0.02266	0.02534	0.01135	0.02266	0.02534	0.02587	0.02354	0.03498
S-PNL P1-LOAD	0.480	0.01006	0.02277	0.02489	0.01006	0.02277	0.02489	0.02274	0.02479	0.03364
S-PNL P3-LOAD	0.480	0.00847	0.02273	0.02425	0.00847	0.02273	0.02425	0.01513	0.02198	0.02668
S-PNL P4-LOAD	0.480	0.02137	0.02674	0.03423	0.02137	0.02674	0.03423	0.05835	0.03456	0.06781
S-SUB1-PNL L1	0.480	0.00768	0.02169	0.02301	0.00768	0.02169	0.02301	0.01518	0.02209	0.02680
S-SUB1-PNL P1	0.480	0.00768	0.02169	0.02301	0.00768	0.02169	0.02301	0.01518	0.02209	0.02680
S-SUB2-PNL L1	0.480	0.01006	0.02277	0.02489	0.01006	0.02277	0.02489	0.02274	0.02479	0.03364
S-SUB2-PNL P1	0.480	0.01006	0.02277	0.02489	0.01006	0.02277	0.02489	0.02274	0.02479	0.03364
S-SUB9-DEEP WELL 2	0.480	0.00482	0.02077	0.02132	0.00482	0.02077	0.02132	0.00623	0.02019	0.02113
S-SUB10-DEEP WELL 2	0.480	0.00442	0.02026	0.02073	0.00442	0.02026	0.02073	0.00500	0.01896	0.01961
S-SWBD11-DEEP WELL 5	0.480	0.00615	0.02186	0.02271	0.00615	0.02186	0.02271	0.00900	0.02316	0.02485
S-SWBD12-DEEP WELL 5	0.480	0.00607	0.02173	0.02256	0.00607	0.02173	0.02256	0.00877	0.02286	0.02449
SCUM EJECTOR CP	0.480	0.30493	0.03711	0.30718	0.30493	0.03711	0.30718	0.95066	0.05914	0.95250
SEC CLARIFIERS 3, 4	0.480	0.40123	0.04265	0.40349	0.40123	0.04265	0.40349	1.25398	0.07271	1.25608
SLUDGE THICKENER DRIVE	0.480	0.07147	0.02534	0.07582	0.07147	0.02534	0.07582	0.21358	0.02840	0.21546
SLUICE GATE 2	0.480	0.46537	0.03782	0.46690	0.46537	0.03782	0.46690	1.45695	0.06182	1.45826
SLUICE GATE #4	0.480	0.46553	0.03808	0.46709	0.46553	0.03808	0.46709	1.45740	0.06241	1.45874
SODIUM BICARBONATE CP	0.480	0.02310	0.03254	0.03991	0.02310	0.03254	0.03991	0.06037	0.04520	0.07542
SUB 1 BUS A	0.480	0.00408	0.02004	0.02045	0.00408	0.02004	0.02045	0.00384	0.01803	0.01843
SUB1 FEED	4.160	0.01845	0.15136	0.15248	0.01845	0.15136	0.15248	0.03827	0.07575	0.08487
SUB1 LS	0.480	0.00408	0.02004	0.02045	0.00408	0.02004	0.02045	0.00384	0.01803	0.01843
SUB1/SUB9	4.160	0.01244	0.14326	0.14380	0.01244	0.14326	0.14380	0.00565	0.04272	0.04310
SUB 2 BUS B	0.480	0.00406	0.02002	0.02043	0.00406	0.02002	0.02043	0.00384	0.01803	0.01843
SUB2 FEED	4.160	0.01711	0.14956	0.15054	0.01711	0.14956	0.15054	0.03102	0.06841	0.07512
SUB2 LS	0.480	0.00406	0.02002	0.02043	0.00406	0.02002	0.02043	0.00384	0.01803	0.01843
SUB2/SUB10	4.160	0.01244	0.14326	0.14380	0.01244	0.14326	0.14380	0.00565	0.04272	0.04310
SUB 3 BUS A	0.480	0.00435	0.02040	0.02086	0.00435	0.02040	0.02086	0.00384	0.01803	0.01843
SUB3 FEED	4.160	0.03847	0.17836	0.18246	0.03847	0.17836	0.18246	0.14700	0.18585	0.23696
SUB3 MAIN LS	0.480	0.00435	0.02040	0.02086	0.00435	0.02040	0.02086	0.00384	0.01803	0.01843
SUB 4 BUS B	0.480	0.00436	0.02042	0.02087	0.00436	0.02042	0.02087	0.00384	0.01803	0.01843
SUB4 FEED	4.160	0.03914	0.17926	0.18348	0.03914	0.17926	0.18348	0.15062	0.18952	0.24209
SUB4 MAIN LS	0.480	0.00436	0.02042	0.02087	0.00436	0.02042	0.02087	0.00384	0.01803	0.01843
SUB 5 BUS A	0.480	0.00488	0.02112	0.02168	0.00488	0.02112	0.02168	0.00384	0.01803	0.01843
SUB5 FEED	4.160	0.07853	0.23236	0.24527	0.07853	0.23236	0.24527	0.36446	0.40605	0.54563

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Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
SUB5 MAIN LS	0.480	0.00488	0.02112	0.02168	0.00488	0.02112	0.02168	0.00384	0.01803	0.01843
SUB 6 BUS B	0.480	0.00490	0.02115	0.02171	0.00490	0.02115	0.02171	0.00384	0.01803	0.01843
SUB6 FEED	4.160	0.07987	0.23416	0.24741	0.07987	0.23416	0.24741	0.37171	0.41339	0.55593
SUB6 MAIN LS	0.480	0.00490	0.02115	0.02171	0.00490	0.02115	0.02171	0.00384	0.01803	0.01843
SUB 7 BUS A	0.480	0.00516	0.02149	0.02210	0.00516	0.02149	0.02210	0.00384	0.01803	0.01843
SUB7 FEED	4.160	0.09923	0.26026	0.27854	0.09923	0.26026	0.27854	0.47681	0.51982	0.70538
SUB7 MAIN LS	0.480	0.00516	0.02149	0.02210	0.00516	0.02149	0.02210	0.00384	0.01803	0.01843
SUB7/SUB11	4.160	0.01244	0.14326	0.14380	0.01244	0.14326	0.14380	0.00565	0.04272	0.04310
SUB 8 BUS B	0.480	0.00516	0.02149	0.02210	0.00516	0.02149	0.02210	0.00384	0.01803	0.01843
SUB8 FEED	4.160	0.09923	0.26026	0.27854	0.09923	0.26026	0.27854	0.47681	0.51982	0.70538
SUB8 MAIN LS	0.480	0.00516	0.02149	0.02210	0.00516	0.02149	0.02210	0.00384	0.01803	0.01843
SUB8/SUB12	4.160	0.01244	0.14326	0.14380	0.01244	0.14326	0.14380	0.00565	0.04272	0.04310
SUB 9 BUS A	0.480	0.00404	0.01977	0.02017	0.00404	0.01977	0.02017	0.00377	0.01773	0.01812
SUB9 FEED	4.160	0.01978	0.15316	0.15443	0.01978	0.15316	0.15443	0.04551	0.08309	0.09474
SUB9 LS	0.480	0.00404	0.01977	0.02017	0.00404	0.01977	0.02017	0.00377	0.01773	0.01812
SUB 10 BUS B	0.480	0.00403	0.01976	0.02016	0.00403	0.01976	0.02016	0.00377	0.01773	0.01812
SUB10 FEED	4.160	0.01911	0.15226	0.15345	0.01911	0.15226	0.15345	0.04189	0.07942	0.08979
SUB10 LS	0.480	0.00403	0.01976	0.02016	0.00403	0.01976	0.02016	0.00377	0.01773	0.01812
SUB11 LS	0.480	0.00469	0.01956	0.02012	0.00469	0.01956	0.02012	0.00442	0.01751	0.01806
SUB12 LS	0.480	0.00469	0.01955	0.02011	0.00469	0.01955	0.02011	0.00442	0.01751	0.01806
SUBNATANT PUMP	0.480	0.02137	0.02540	0.03319	0.02137	0.02540	0.03319	0.05573	0.02848	0.06259
SUPERNANANT PS CP	0.480	0.03030	0.03792	0.04854	0.03030	0.03792	0.04854	0.08305	0.05843	0.10155
SWBD 11 BUS A	0.480	0.00585	0.02148	0.02227	0.00585	0.02148	0.02227	0.00808	0.02224	0.02366
SWBD11 LS	0.480	0.00585	0.02148	0.02227	0.00585	0.02148	0.02227	0.00808	0.02224	0.02366
SWBD 12 BUS B	0.480	0.00577	0.02135	0.02212	0.00577	0.02135	0.02212	0.00785	0.02194	0.02330
SWBD12 LS	0.480	0.00577	0.02135	0.02212	0.00577	0.02135	0.02212	0.00785	0.02194	0.02330
SWGR BUS A	4.160	0.01244	0.14326	0.14380	0.01244	0.14326	0.14380	0.00565	0.04272	0.04310
SWGR BUS B	4.160	0.01244	0.14326	0.14380	0.01244	0.14326	0.14380	0.00565	0.04272	0.04310
SWGR MAIN 1 LS	4.160	0.01244	0.14326	0.14380	0.01244	0.14326	0.14380	0.00565	0.04272	0.04310
SWGR MAIN 2 LS	4.160	0.01244	0.14326	0.14380	0.01244	0.14326	0.14380	0.00565	0.04272	0.04310
SWITCH 11	4.160	0.02045	0.15406	0.15541	0.02045	0.15406	0.15541	0.04914	0.08676	0.09971
SWITCH 12	4.160	0.01978	0.15316	0.15443	0.01978	0.15316	0.15443	0.04551	0.08309	0.09474
T-AC-1	0.480	0.23695	0.03275	0.23921	0.23695	0.03275	0.23921	0.73240	0.04276	0.73365
T-BLOWER AB1	4.160	0.15168	0.27021	0.30987	0.15168	0.27021	0.30987	0.55019	0.56392	0.78785
T-BLOWER AB2	4.160	0.14673	0.26906	0.30647	0.14673	0.26906	0.30647	0.54253	0.55891	0.77892
T-BLOWER AB3	4.160	0.14178	0.26791	0.30311	0.14178	0.26791	0.30311	0.53487	0.55390	0.77000
T-BLOWER AB4	4.160	0.13549	0.26496	0.29759	0.13549	0.26496	0.29759	0.51996	0.54155	0.75076

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Bus ID	kV	Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
		Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
T-BLOWER AB5	4.160	0.13054	0.26381	0.29434	0.13054	0.26381	0.29434	0.51230	0.53654	0.74184
T-DEEP WELL PUMP 1	0.480	0.01281	0.03102	0.03356	0.01281	0.03102	0.03356	0.03141	0.04540	0.05521
T-DEEP WELL PUMP 2	0.480	0.01358	0.03201	0.03477	0.01358	0.03201	0.03477	0.03387	0.04786	0.05863
T-DEEP WELL PUMP 3	0.480	0.01300	0.03126	0.03385	0.01300	0.03126	0.03385	0.03203	0.04602	0.05607
T-DEEP WELL PUMP 4	0.480	0.01492	0.03311	0.03632	0.01492	0.03311	0.03632	0.03664	0.05083	0.06266
T-DEEP WELL PUMP 5	0.480	0.01533	0.03360	0.03693	0.01533	0.03360	0.03693	0.03795	0.05208	0.06444
T-DEEP WELL PUMP 6	0.480	0.01523	0.03348	0.03678	0.01523	0.03348	0.03678	0.03764	0.05177	0.06401
T-DP1-WAS PUMP 5	0.480	0.19444	0.03714	0.19796	0.19444	0.03714	0.19796	0.60347	0.06009	0.60645
T-DP1-WAS PUMP 6	0.480	0.19444	0.03714	0.19796	0.19444	0.03714	0.19796	0.60347	0.06009	0.60645
T-DP2-WAS PUMP 1	0.480	0.09417	0.03348	0.09995	0.09417	0.03348	0.09995	0.28762	0.05109	0.29212
T-DP2-WAS PUMP 2	0.480	0.09417	0.03348	0.09995	0.09417	0.03348	0.09995	0.28762	0.05109	0.29212
T-GEN 1	4.160	0.06059	1.81363	1.81464	0.12260	1.10341	1.11019	0.00939	0.06576	0.06643
T-GEN 2	4.160	0.05394	1.62796	1.62885	0.11185	1.00666	1.01286	0.06383	0.44682	0.45135
T-MCC D4-BLOWER 1	0.480	0.03395	0.03951	0.05210	0.03395	0.03951	0.05210	0.09295	0.05939	0.11031
T-MCC D4-BLOWER 3	0.480	0.02945	0.03708	0.04736	0.02945	0.03708	0.04736	0.07878	0.05341	0.09518
T-MCC D4-PMP 1	0.480	0.05095	0.04061	0.06516	0.05095	0.04061	0.06516	0.14650	0.06208	0.15912
T-MCC D4-PMP 3	0.480	0.04295	0.03776	0.05719	0.04295	0.03776	0.05719	0.12130	0.05507	0.13322
T-MCC D5-BLOWER 2	0.480	0.03945	0.04248	0.05798	0.03945	0.04248	0.05798	0.11028	0.06669	0.12888
T-MCC D5-BLOWER 4	0.480	0.02945	0.03708	0.04736	0.02945	0.03708	0.04736	0.07878	0.05341	0.09518
T-MCC D5-PMP 2	0.480	0.05895	0.04346	0.07324	0.05895	0.04346	0.07324	0.17170	0.06909	0.18508
T-MCC D5-PMP 4	0.480	0.04295	0.03776	0.05719	0.04295	0.03776	0.05719	0.12130	0.05507	0.13322
T-MCCD1-PNL LD	0.208	0.03954	0.06053	0.07230	0.03954	0.06053	0.07230	0.03231	0.05461	0.06345
T-MCCD1-PNL LDW	0.208	0.03635	0.05672	0.06737	0.03635	0.05672	0.06737	0.03084	0.05213	0.06057
T-MCCD1-PNL LHW 2	0.208	0.03151	0.05272	0.06142	0.03151	0.05272	0.06142	0.02864	0.04840	0.05624
T-SUB2-PNL CP	0.208	0.06249	0.06939	0.09338	0.06249	0.06939	0.09338	0.04302	0.06346	0.07667
T-SUB11-SWBD11	0.480	0.00469	0.01956	0.02012	0.00469	0.01956	0.02012	0.00442	0.01751	0.01806
T-SUB12-SWBD12	0.480	0.00469	0.01955	0.02011	0.00469	0.01955	0.02011	0.00442	0.01751	0.01806
T-TR-DP1-XLC	0.480	0.02644	0.03165	0.04124	0.02644	0.03165	0.04124	0.07427	0.04659	0.08767
T-TR-DP4-XLC	0.480	0.02457	0.03097	0.03953	0.02457	0.03097	0.03953	0.06843	0.04497	0.08188
T-TR-MCC 1-PNL XFMR	0.480	0.03722	0.03596	0.05176	0.03722	0.03596	0.05176	0.10566	0.05447	0.11887
T-TR-MCC 1-PNL XFMR (2)	0.208	0.09874	0.11043	0.14814	0.09874	0.11043	0.14814	0.09175	0.10368	0.13844
T-TR-MCC B1-PNL XFMR	0.480	0.01562	0.02321	0.02798	0.01562	0.02321	0.02798	0.03762	0.02310	0.04415
T-TR-MCC B1-PNL XFMR2	0.208	0.03525	0.05897	0.06870	0.03525	0.05897	0.06870	0.03231	0.05461	0.06345
T-TR-MCC B2-PNL (2)	0.208	0.03207	0.05290	0.06186	0.03207	0.05290	0.06186	0.02864	0.04840	0.05624
T-TR-MCC B2-PNL LB1 (2)	0.208	0.03333	0.05282	0.06245	0.03333	0.05282	0.06245	0.02864	0.04840	0.05624
T-TR-MCC D1-PNL LD 2	0.480	0.03060	0.03074	0.04338	0.03060	0.03074	0.04338	0.08400	0.04078	0.09337
T-TR-MCC D1-PNL LD2 (2)	0.208	0.03586	0.05666	0.06705	0.03586	0.05666	0.06705	0.03011	0.05089	0.05913

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: SWWRF

**ETAP**  
 12.6.0C

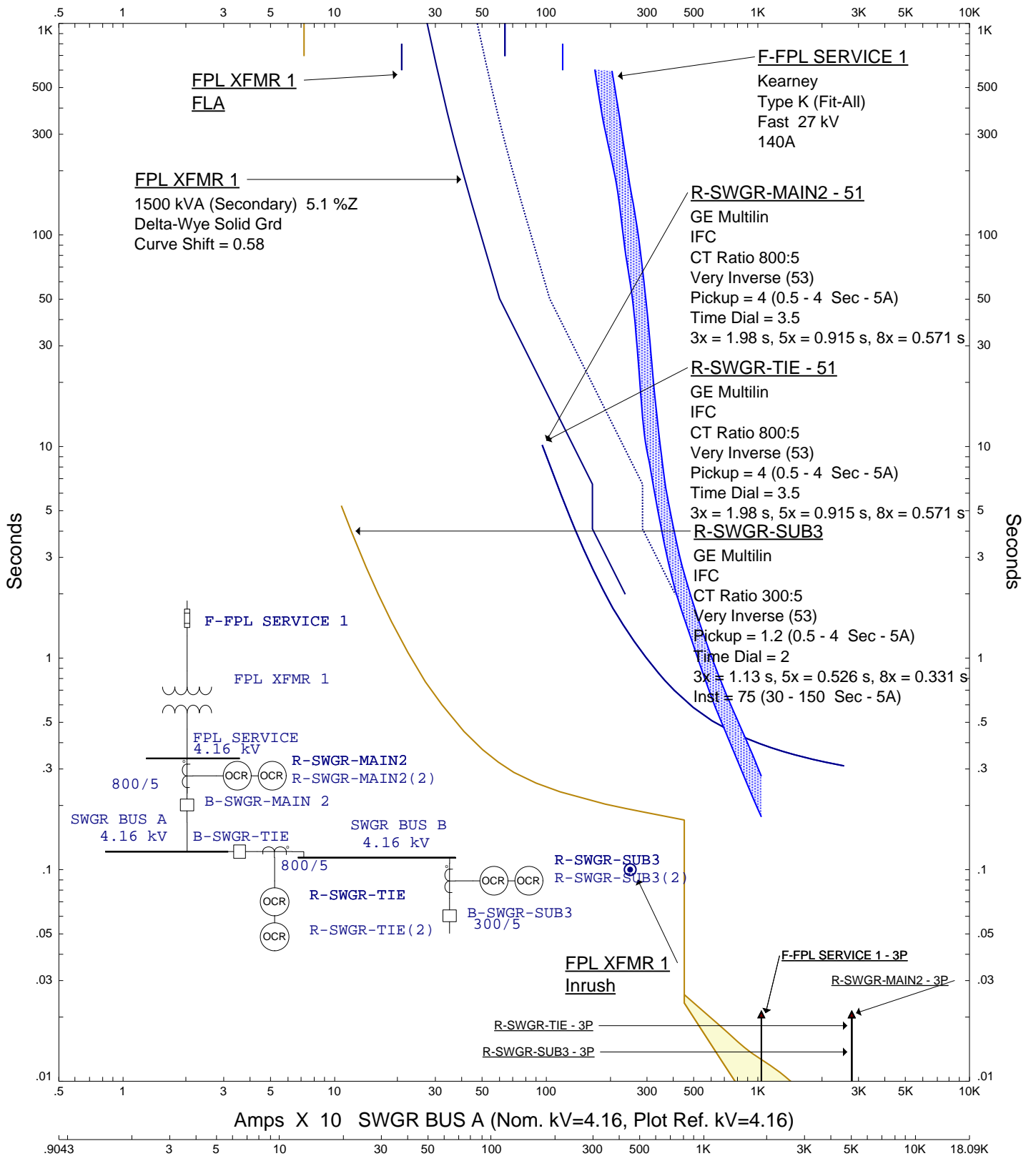
Study Case: SC

Page: 21  
 Date: 12-18-2014  
 SN: CAROLLOWAN  
 Revision: Base  
 Config.: Normal

Bus		Positive Sequence Imp. (ohm)			Negative Sequence Imp. (ohm)			Zero Sequence Imp. (ohm)		
ID	kV	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance	Resistance	Reactance	Impedance
T-TR-MCCB2-PNL LB1	0.480	0.02497	0.02350	0.03428	0.02497	0.02350	0.03428	0.06710	0.02387	0.07122
T-TR-MCCB2-PNL XFMR	0.480	0.01827	0.02395	0.03012	0.01827	0.02395	0.03012	0.04600	0.02498	0.05234
T-TR-MCCB4-PNL LP2	0.480	0.01522	0.02268	0.02732	0.01522	0.02268	0.02732	0.03639	0.02187	0.04246
T-TR-MCCB4-PNL LP2 (2)	0.208	0.09461	0.10794	0.14353	0.09461	0.10794	0.14353	0.09175	0.10368	0.13844
T-TR-MCCD1-PNL LD	0.480	0.03850	0.03152	0.04976	0.03850	0.03152	0.04976	0.10887	0.04269	0.11694
T-TR-MCCDW1-PNL LDW	0.480	0.02934	0.02444	0.03819	0.02934	0.02444	0.03819	0.08000	0.02529	0.08390
T-TR-MCCHW1-PNL LHW	0.480	0.01525	0.02298	0.02758	0.01525	0.02298	0.02758	0.03816	0.02434	0.04526
T-TR-SUB1/2-PNL L1 XFMR	0.480	0.01126	0.02332	0.02590	0.01126	0.02332	0.02590	0.02652	0.02615	0.03724
T-TR-SUB1/2-PNL L1 XFMR 2	0.208	0.01475	0.02573	0.02965	0.01475	0.02573	0.02965	0.01263	0.02135	0.02480
T-TR-SUB2-PNL CP XFMR	0.480	0.12656	0.03602	0.13159	0.12656	0.03602	0.13159	0.38971	0.05739	0.39391
T-TR-SUB2-PNL CP XFMR 2	0.208	0.06049	0.06882	0.09162	0.06049	0.06882	0.09162	0.03672	0.06206	0.07211
T-TR-T7A-PRI	4.160	0.11747	0.27046	0.29487	0.11747	0.27046	0.29487	0.50575	0.54583	0.74412
T-TR-T7A-SEC	0.480	0.00578	0.02343	0.02414	0.00578	0.02343	0.02414	0.00422	0.01983	0.02028
T-TR-T8A-PRI	4.160	0.11747	0.27046	0.29487	0.11747	0.27046	0.29487	0.50575	0.54583	0.74412
T-TR-T8A-SEC	0.480	0.00578	0.02343	0.02414	0.00578	0.02343	0.02414	0.00422	0.01983	0.02028
THICK WAS 3 AFD	0.480	0.00787	0.02297	0.02428	0.00787	0.02297	0.02428	0.01321	0.02251	0.02609
THICK WAS 4 AFD	0.480	0.00787	0.02297	0.02428	0.00787	0.02297	0.02428	0.01321	0.02251	0.02609
VALVE OPERATOR	0.480	0.05107	0.02418	0.05650	0.05107	0.02418	0.05650	0.14927	0.02548	0.15143
WATER HEATER	0.480	0.01574	0.02377	0.02851	0.01574	0.02377	0.02851	0.03716	0.02364	0.04404

**APPENDIX C1 – EXISTING TIME CURRENT CURVES**

Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)

.9043 3 5 10 30 50 100 300 500 1K 3K 5K 10K 18.09K

Amps (Plot Ref. kV=23)

ETAP Star 12.6.0C

TCC 01:MAIN2/TIE/SUB3

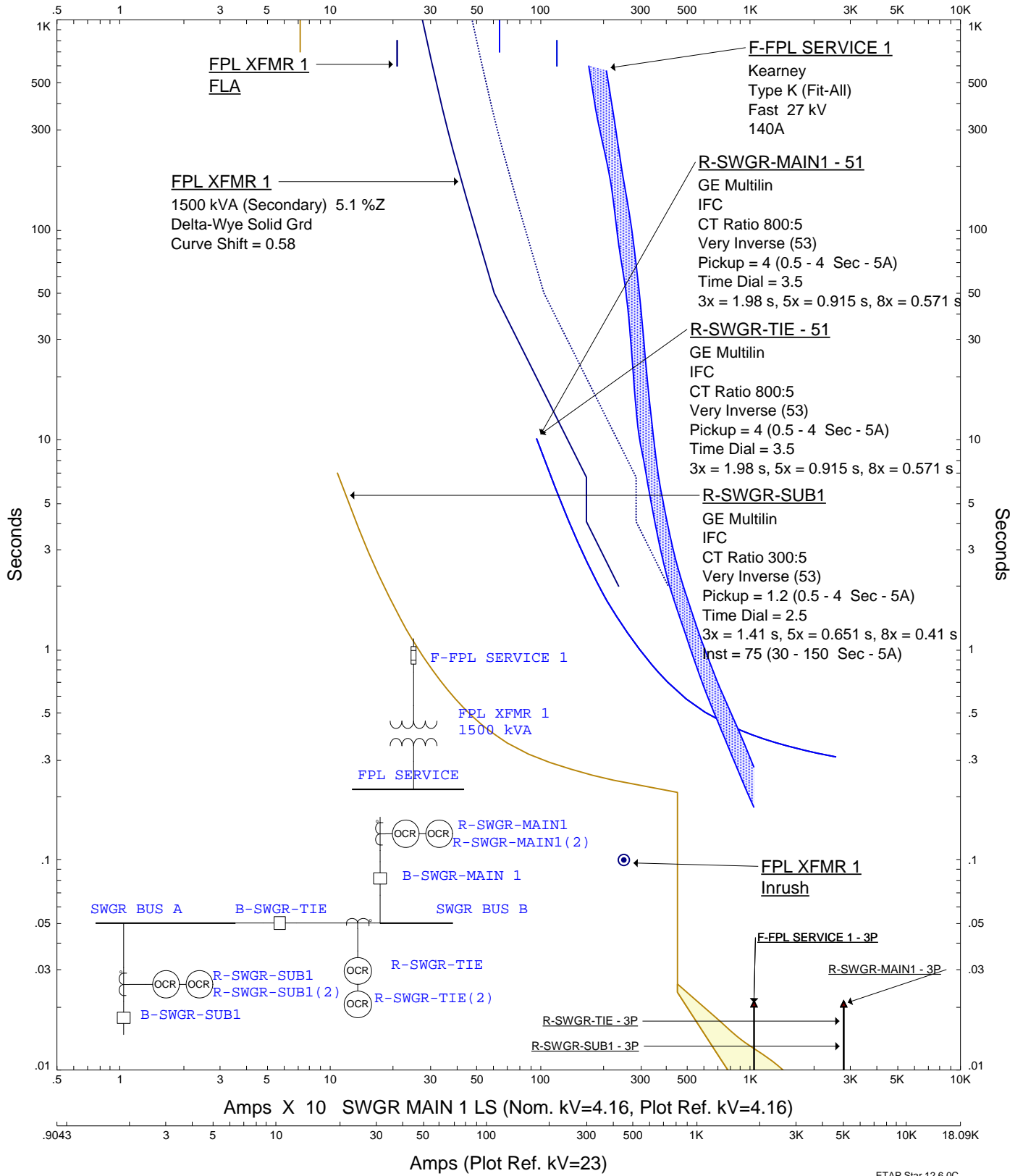


Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW

Date: 04-28-2014



Amps X 10 SWGR MAIN 1 LS (Nom. kV=4.16, Plot Ref. kV=4.16)



ETAP Star 12.6.0C

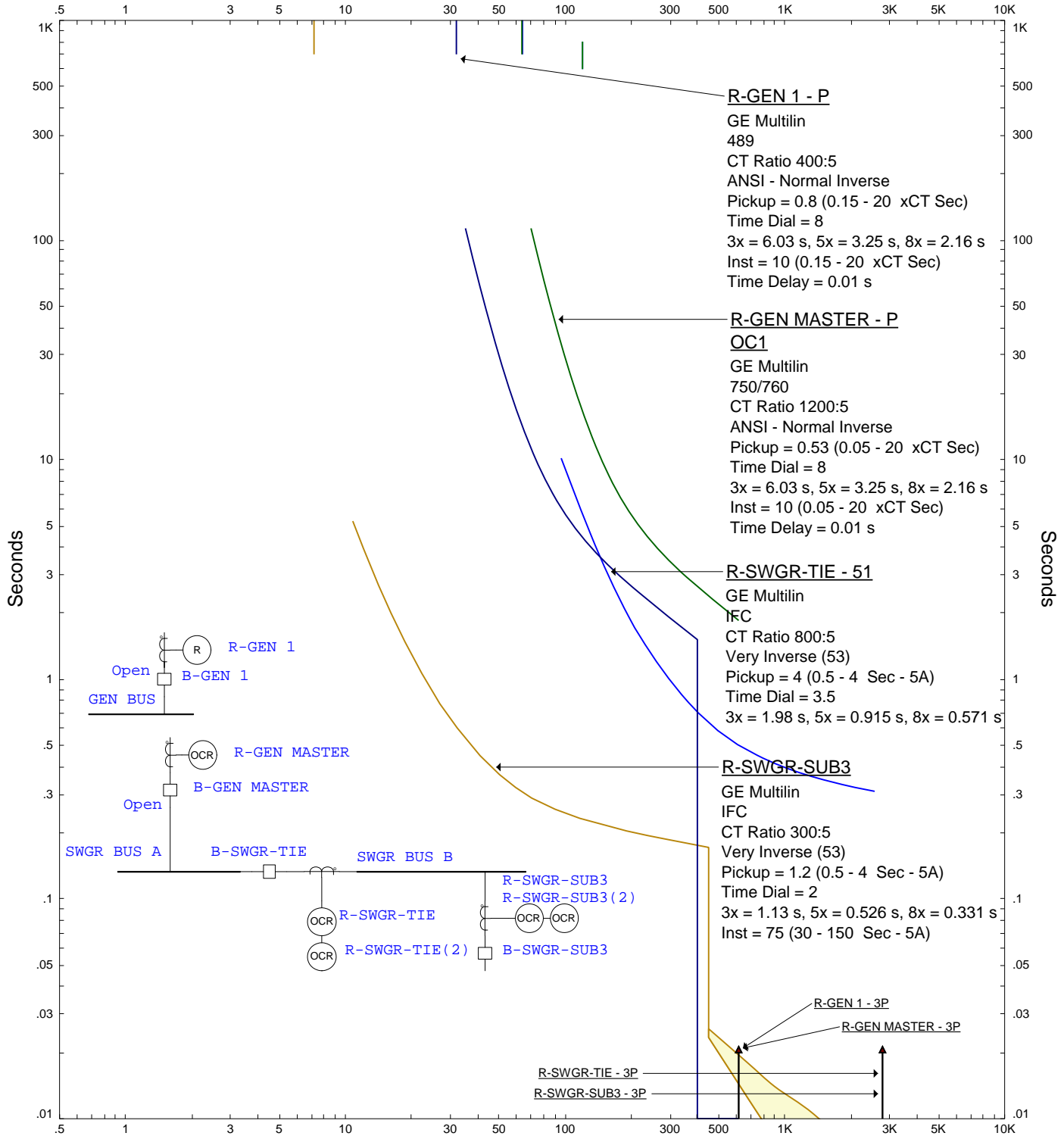
TCC 02:MAIN1/TIE/SUB1



Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW


Date: 04-28-2014

Amps X 10 GEN BUS (Nom. kV=4.16, Plot Ref. kV=4.16)

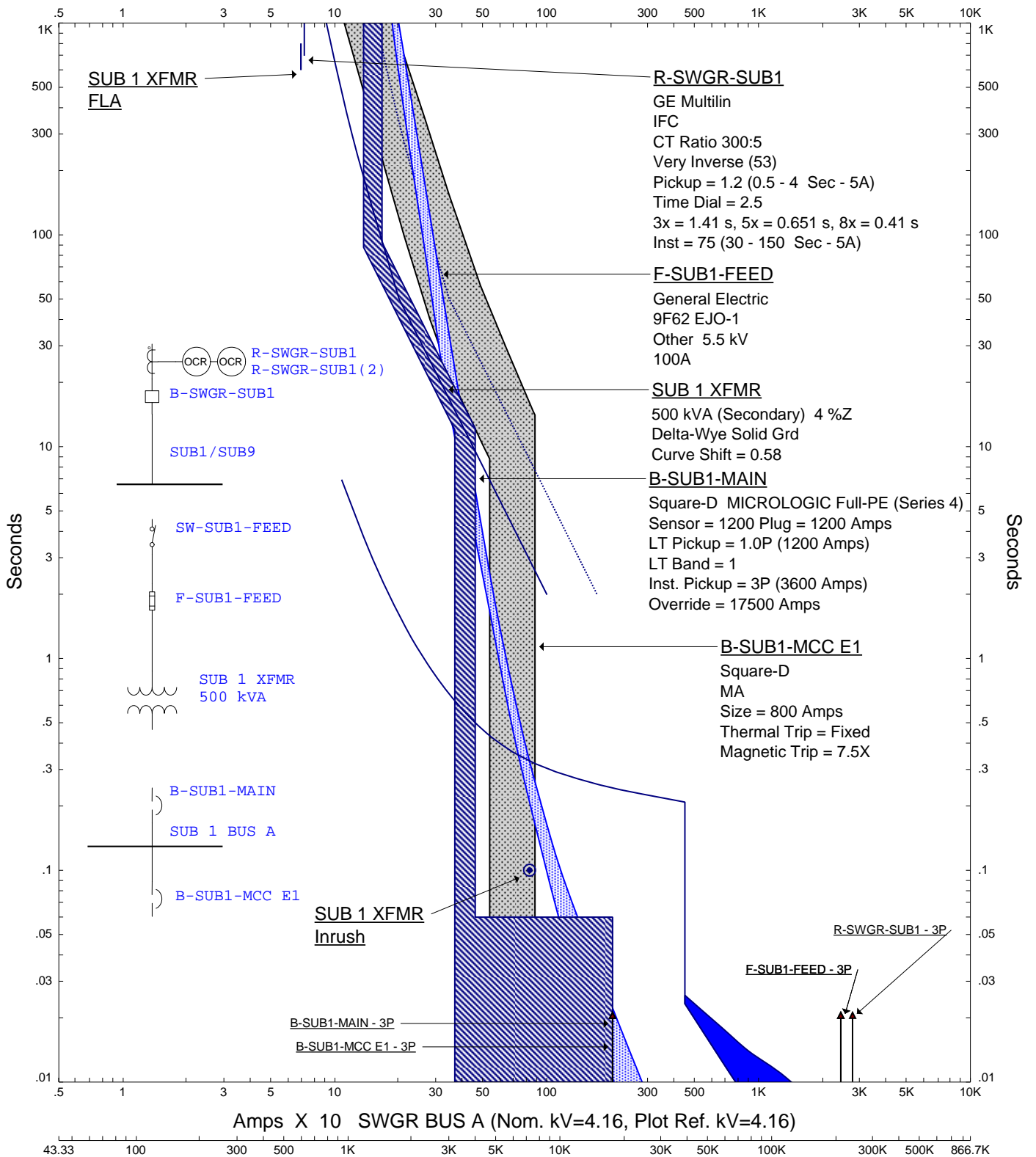



Amps X 10 GEN BUS (Nom. kV=4.16, Plot Ref. kV=4.16)

ETAP Star 12.6.0C

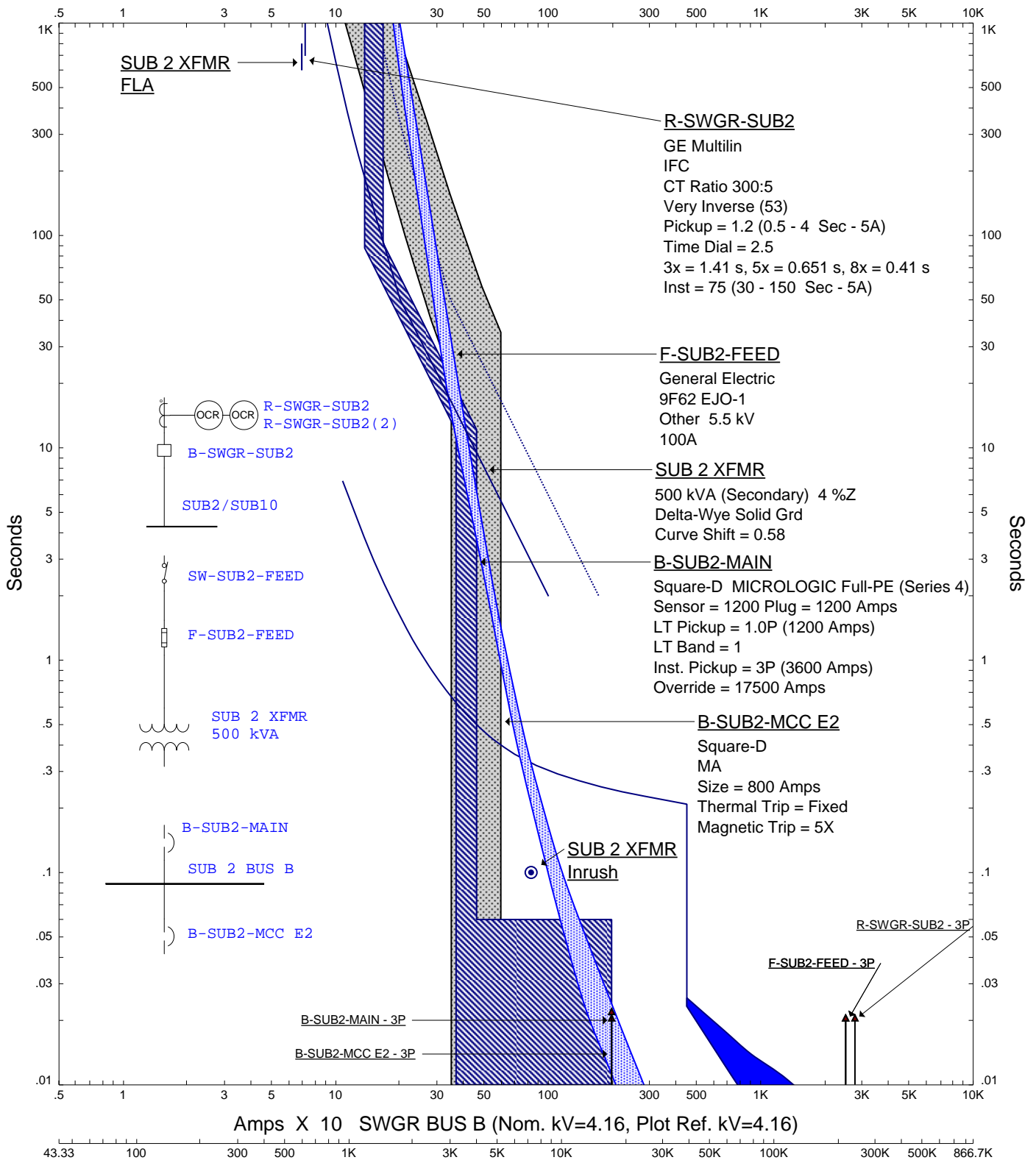
	<b>TCC 03:GEN1/TIE/SUB3</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW		Date: 04-28-2014

Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)



<b>TCC 04:SWGR/SUB1/MCCE1</b>		ETAP Star 12.6.0C
 Engineers...Working Wonders With Water™		
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW	Date: 04-28-2014	
		<b>154</b>

Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps SUB 2 BUS B (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

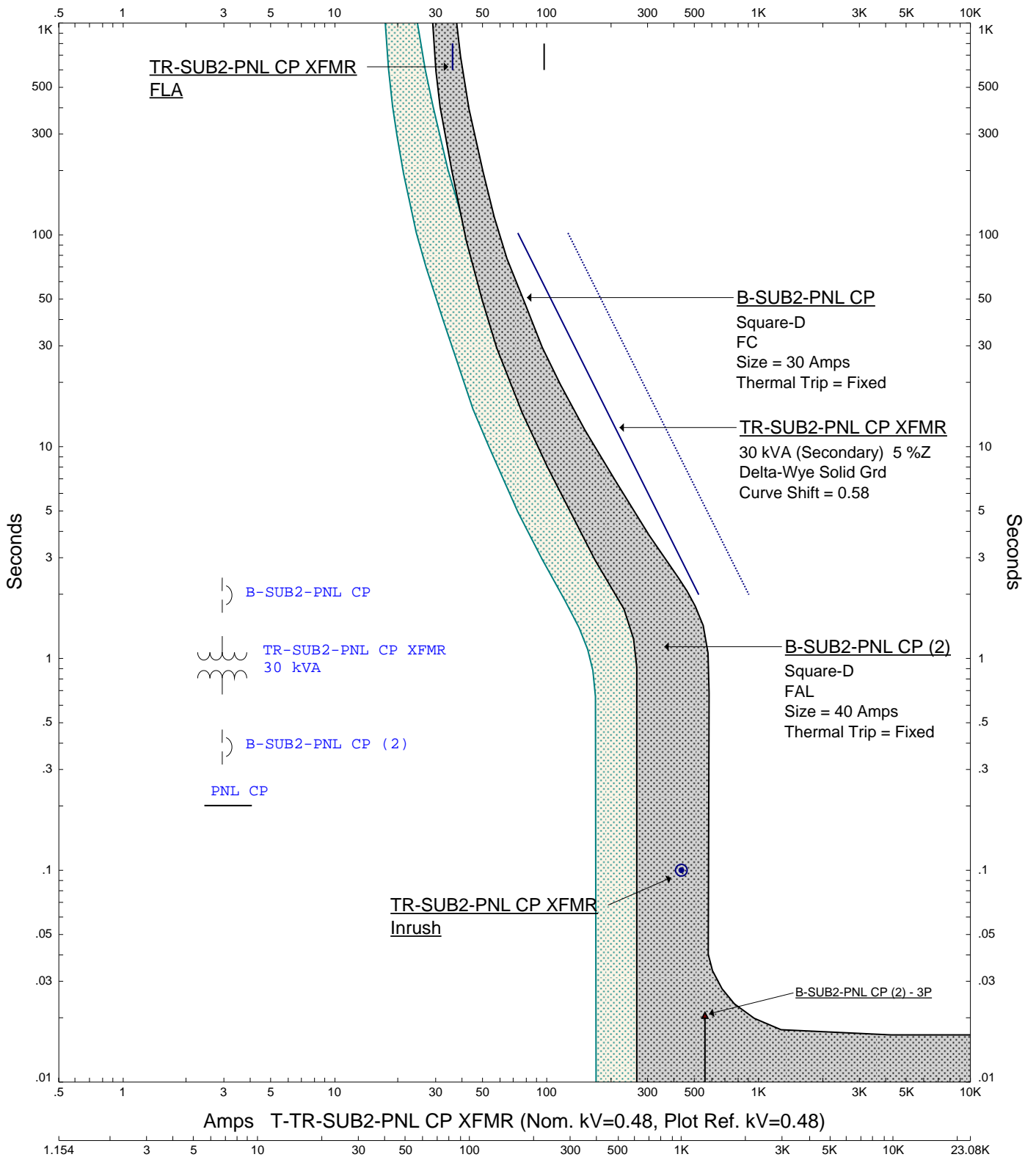
TCC 05:SWGR/SUB2/MCCE2



Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW

Date: 04-28-2014

Amps T-TR-SUB2-PNL CP XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps T-TR-SUB2-PNL CP XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)

Amps PNL CP (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

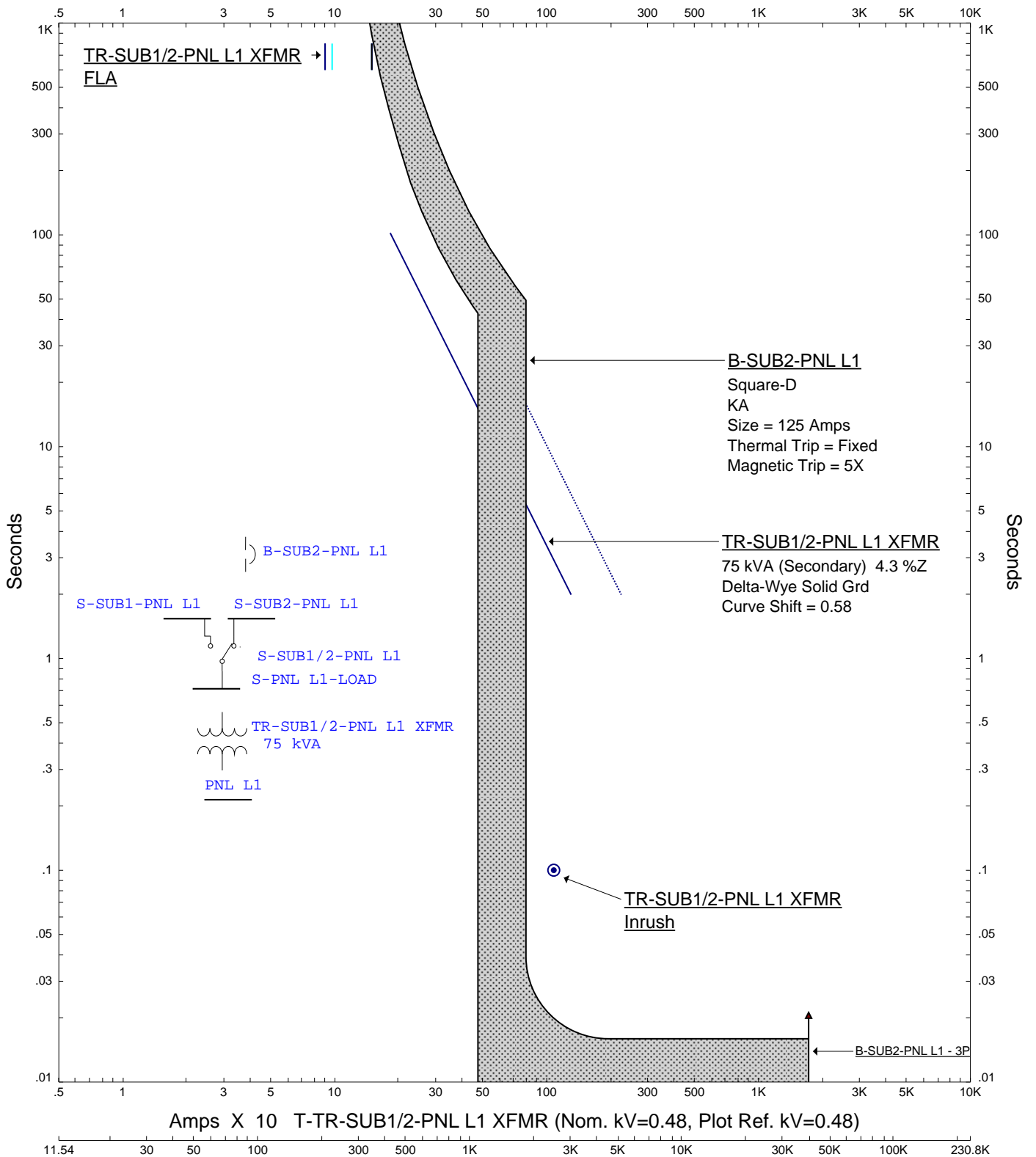
TCC 06: SUB2/PNL CP



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 T-TR-SUB1/2-PNL L1 XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)



ETAP Star 12.6.0C

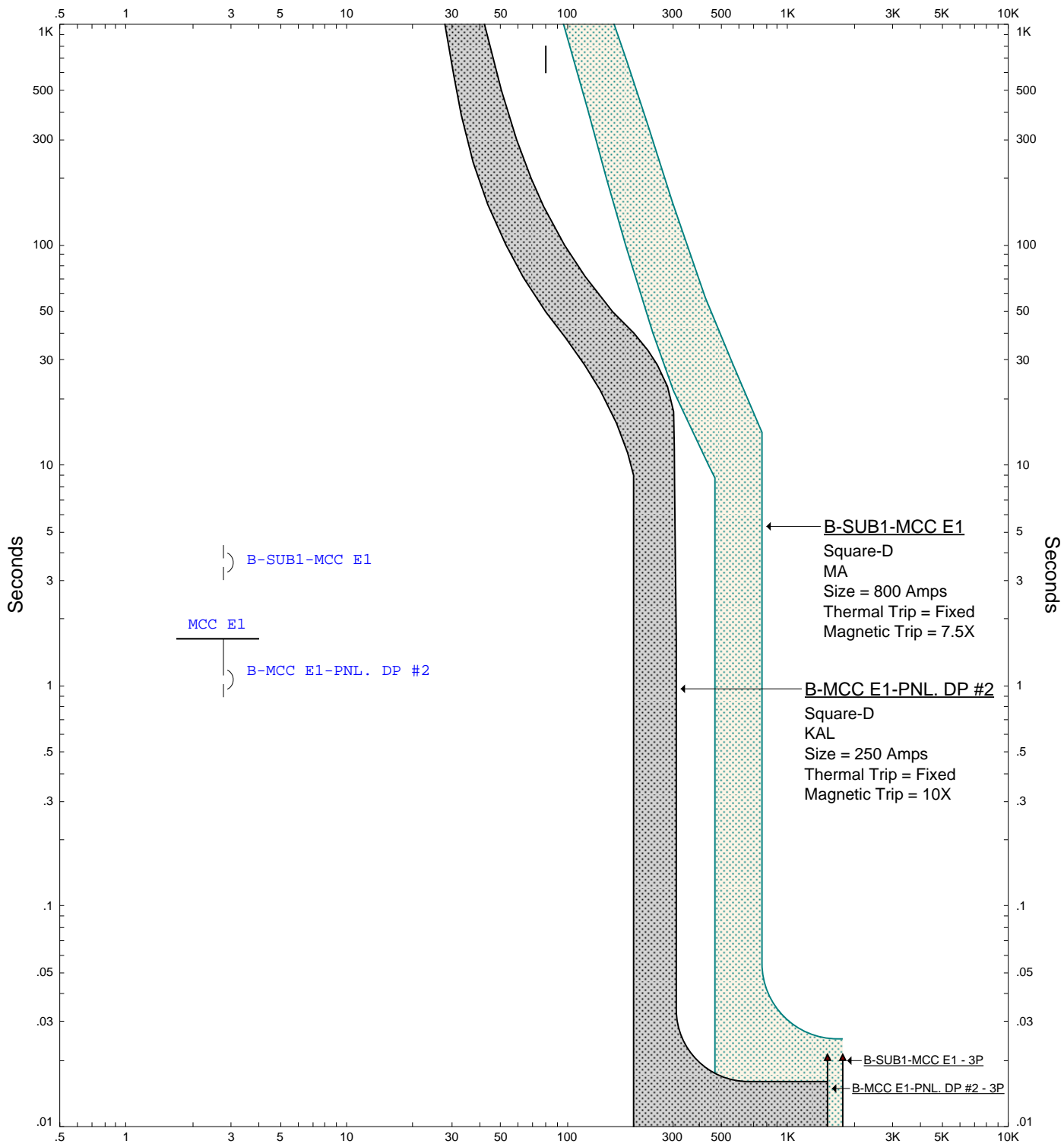
TCC 07:SUB2/PNL L1



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 SUB 1 BUS A (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 SUB 1 BUS A (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

TCC 08:SUB1/MCCE1/PNL DP2

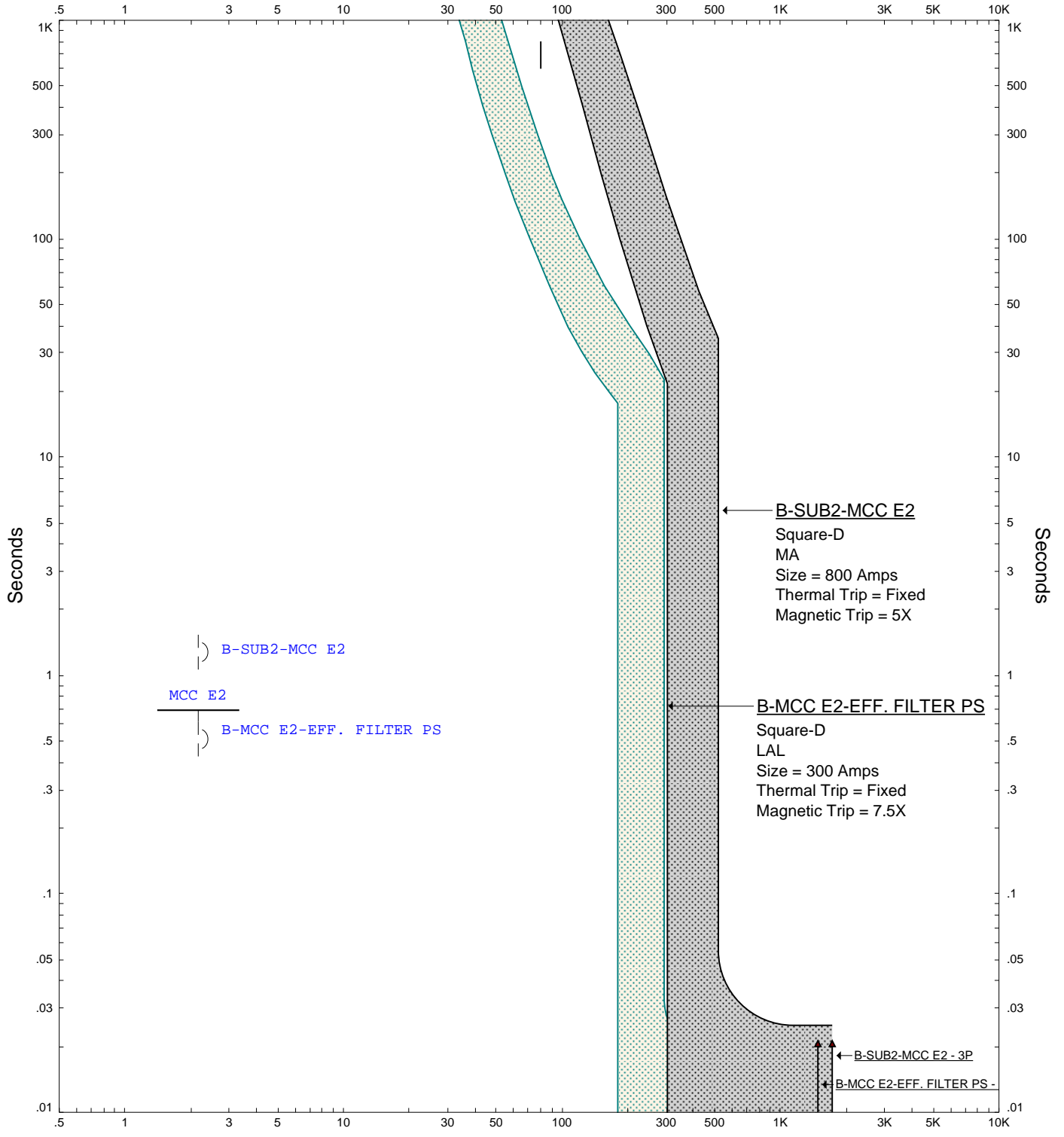


Project: MANATEE COUNTY ESS  
 Location: Swwrf  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014




Amps X 10 MCC E2 (Nom. kV=0.48, Plot Ref. kV=0.48)



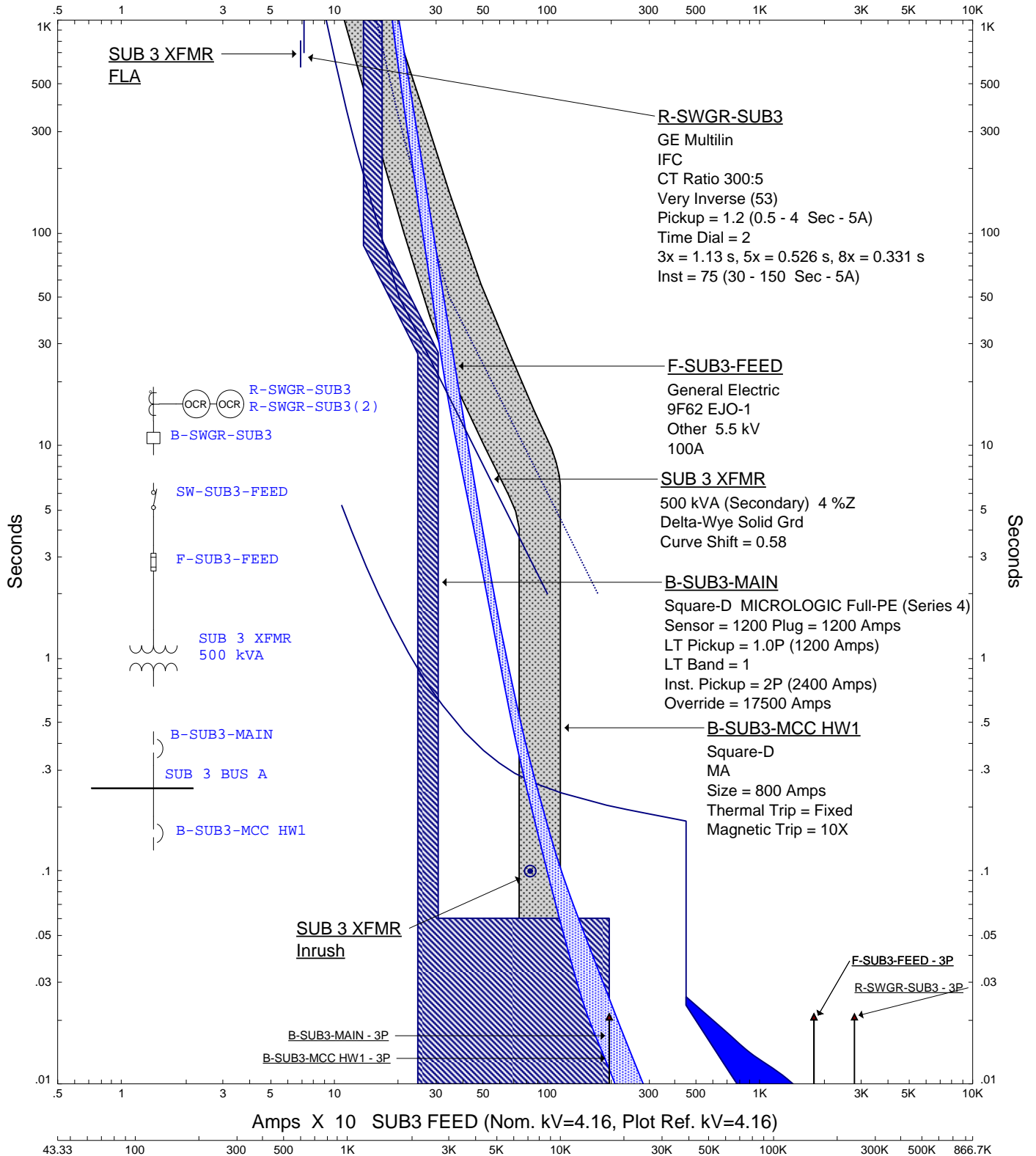
Amps X 10 MCC E2 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 09:SUB2/MCCE2/EFF FIL</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: Swwrf Contract: 8910V.00 Engineer: KTW		Date: 04-28-2014



Amps X 10 SUB3 FEED (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps MCC HW 1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

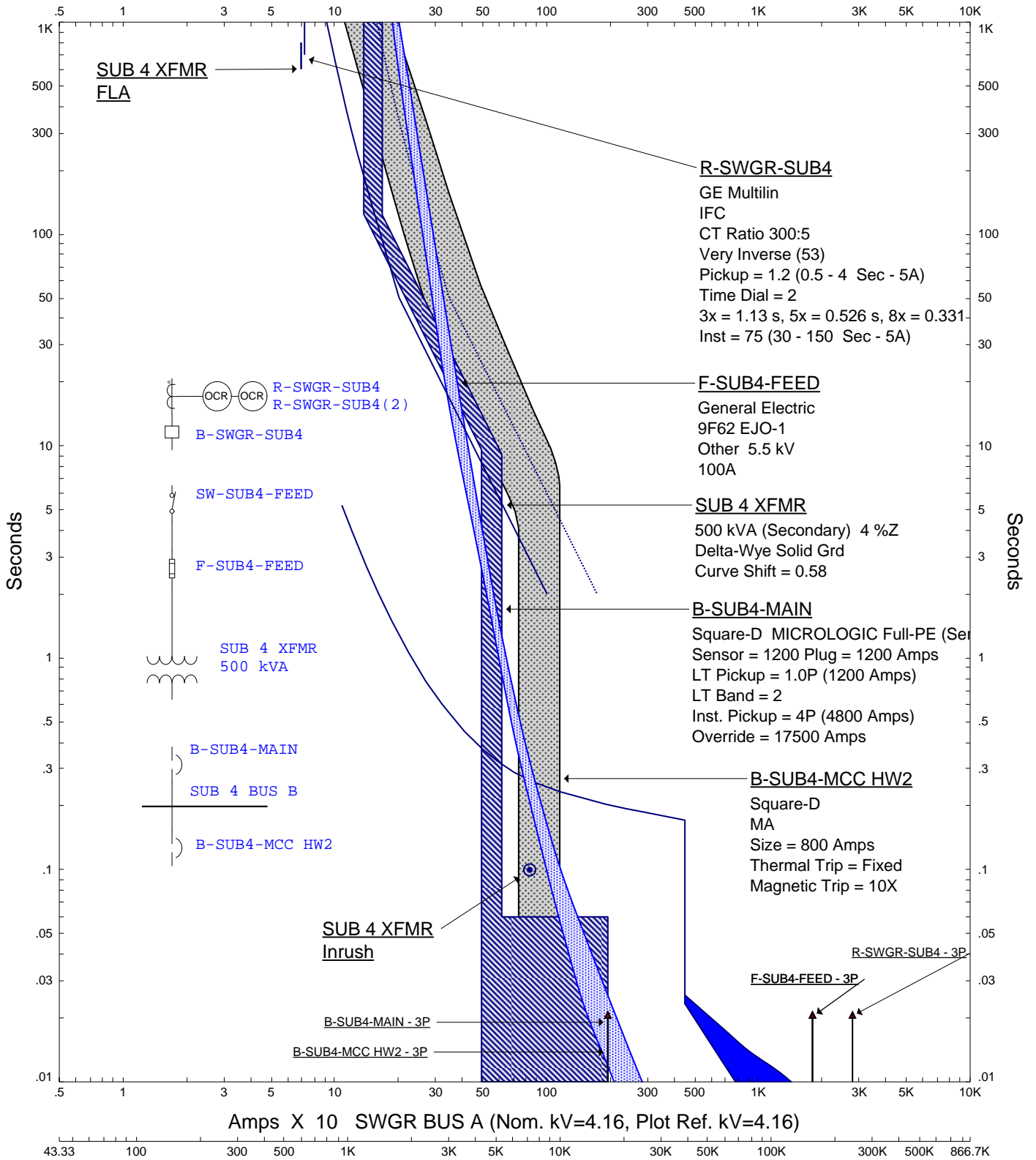
TCC 10:SWGR/SUB3/MCCHW1



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)

Amps SUB4 MAIN LS (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

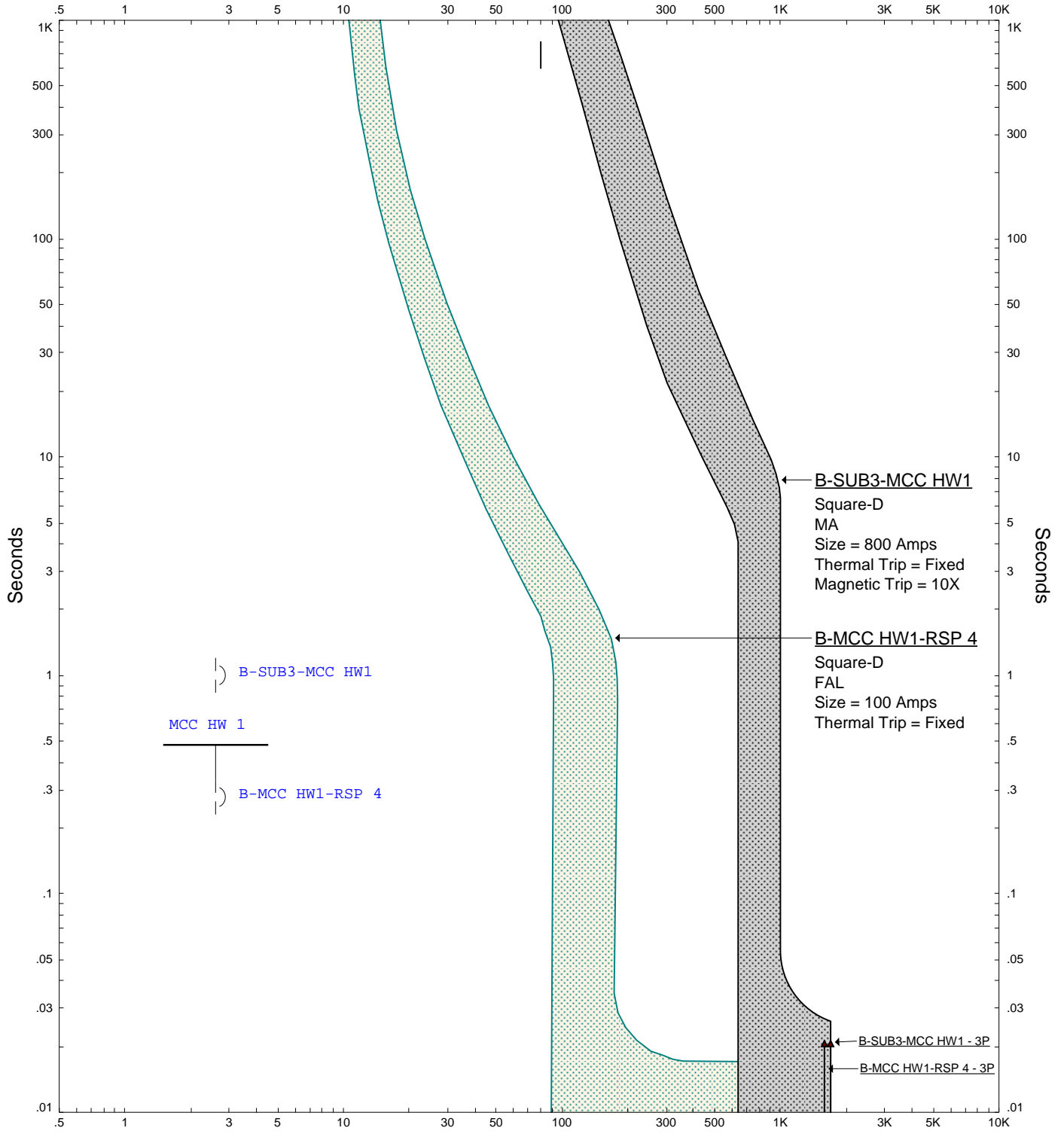
TCC 11:SWGR/SUB4/MCCHW2



Project: MANATEE COUNTY ESS  
Location: Swwrf  
Contract: 8910V.00  
Engineer: KTW

Date: 04-28-2014

Amps X 10 MCC HW 1 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 MCC HW 1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

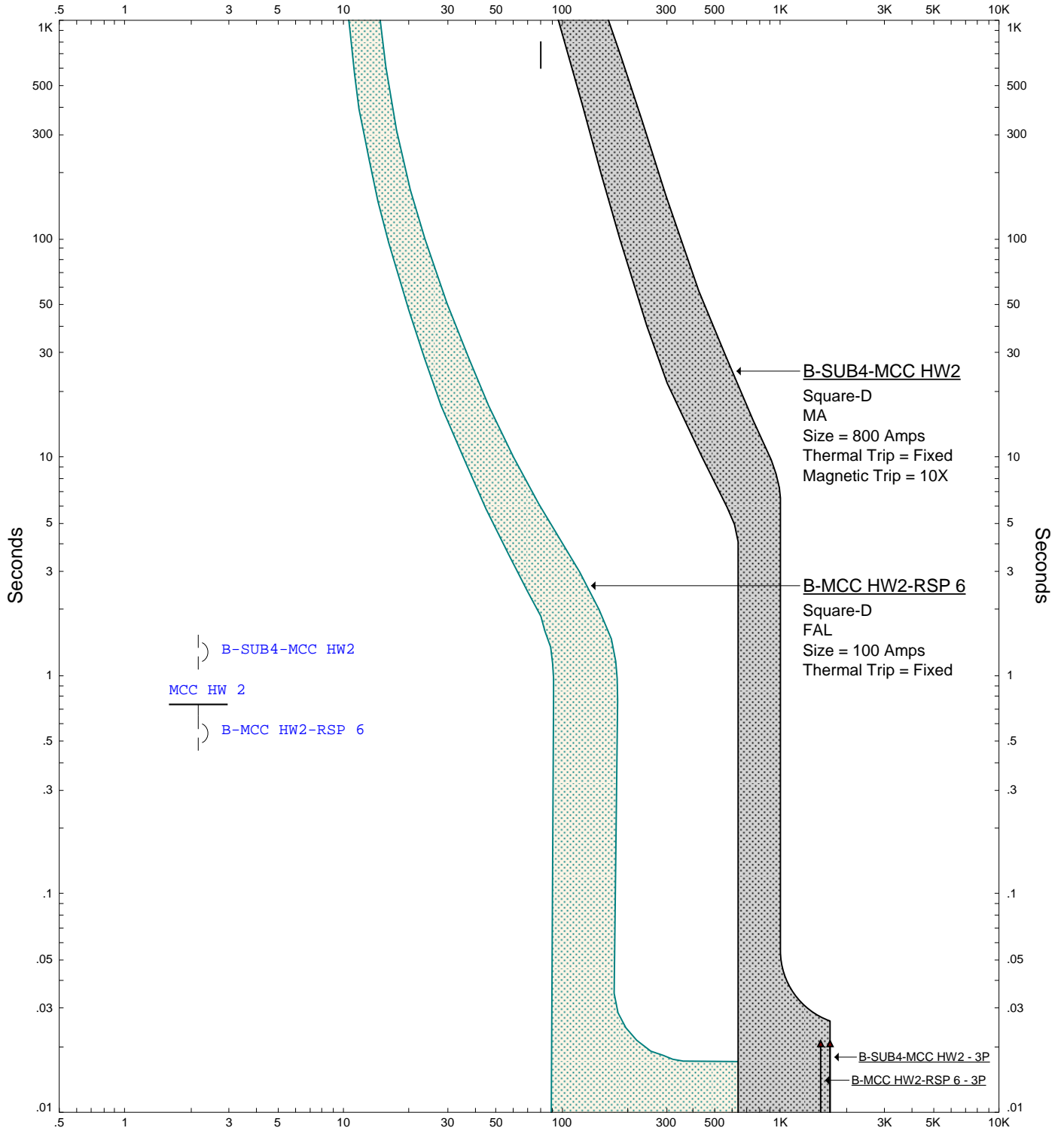
TCC 12:SUB3/MCCHW1/RSP4



Project: MANATEE COUNTY ESS  
 Location: Swwrf  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 MCC HW 2 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 MCC HW 2 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

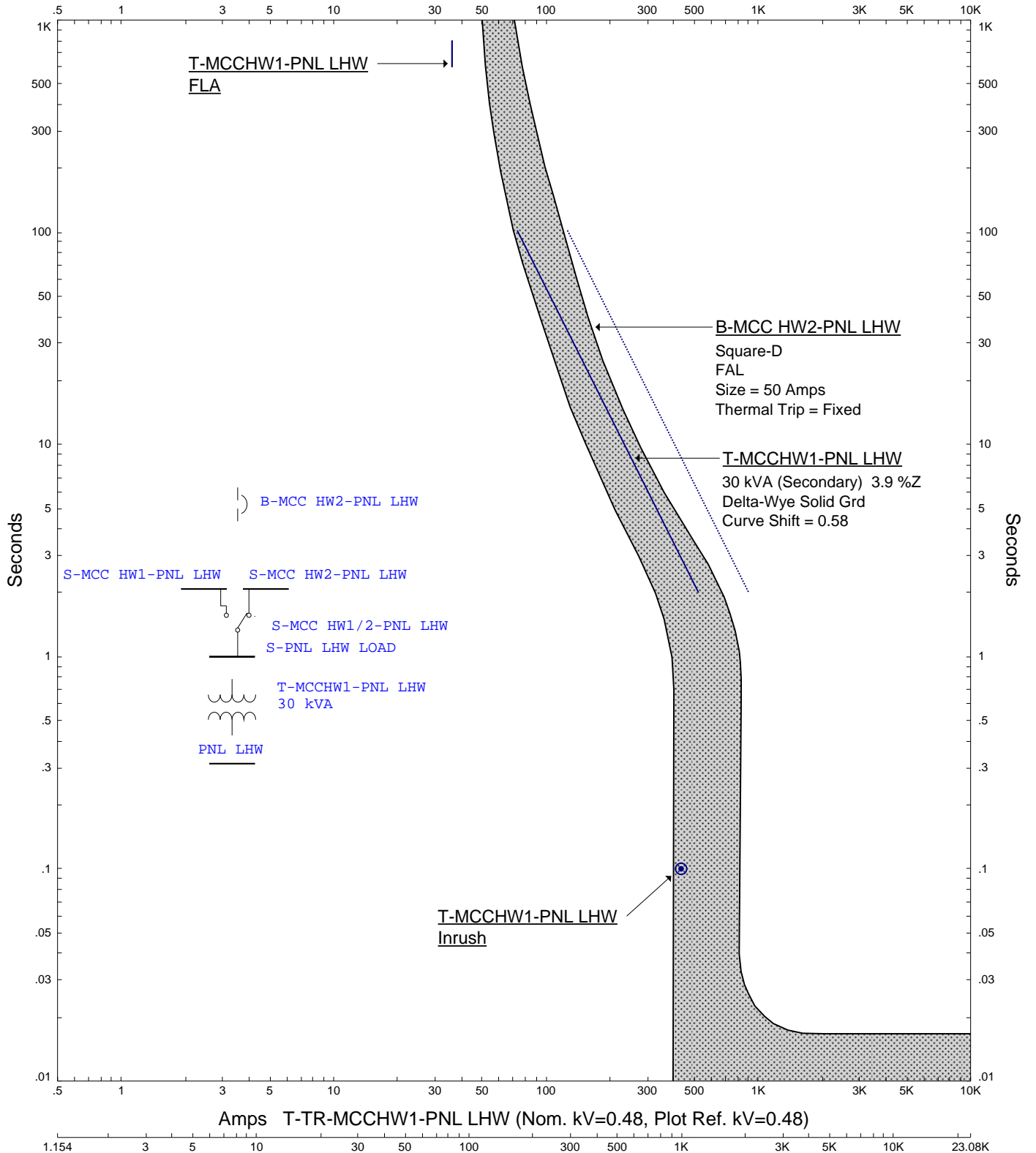
TCC 13:SUB4/MCCHW2/RSP6



Project: MANATEE COUNTY ESS  
 Location: Swwrf  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps T-TR-MCCHW1-PNL LHW (Nom. kV=0.48, Plot Ref. kV=0.48)



ETAP Star 12.6.0C

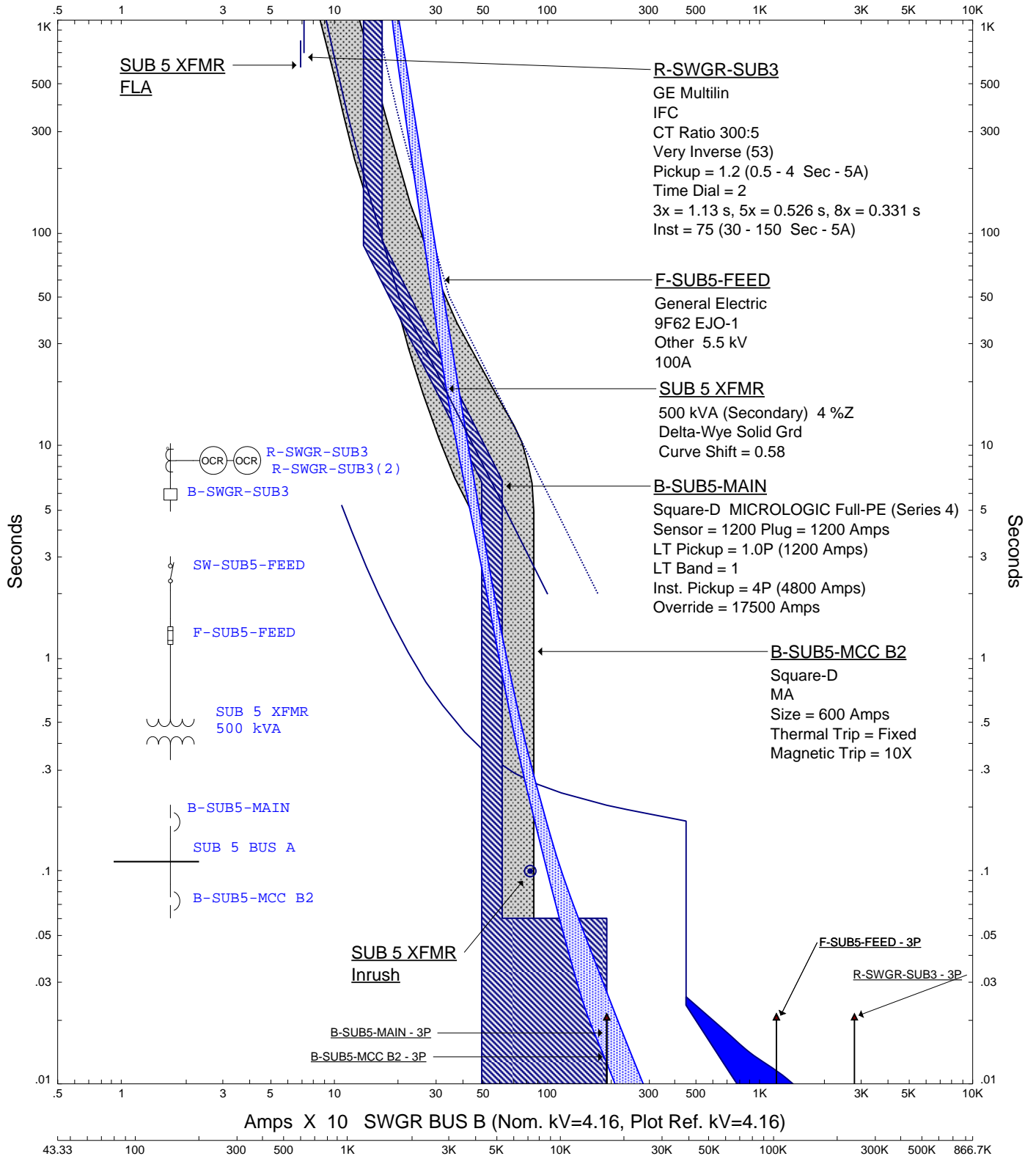
TCC 14:MCCHW2/PNL LHW



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)

43.33 100 300 500 1K 3K 5K 10K 30K 50K 100K 300K 500K 866.7K

Amps SUB 5 BUS A (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

TCC 15:SWGR/SUB5/MCCB2

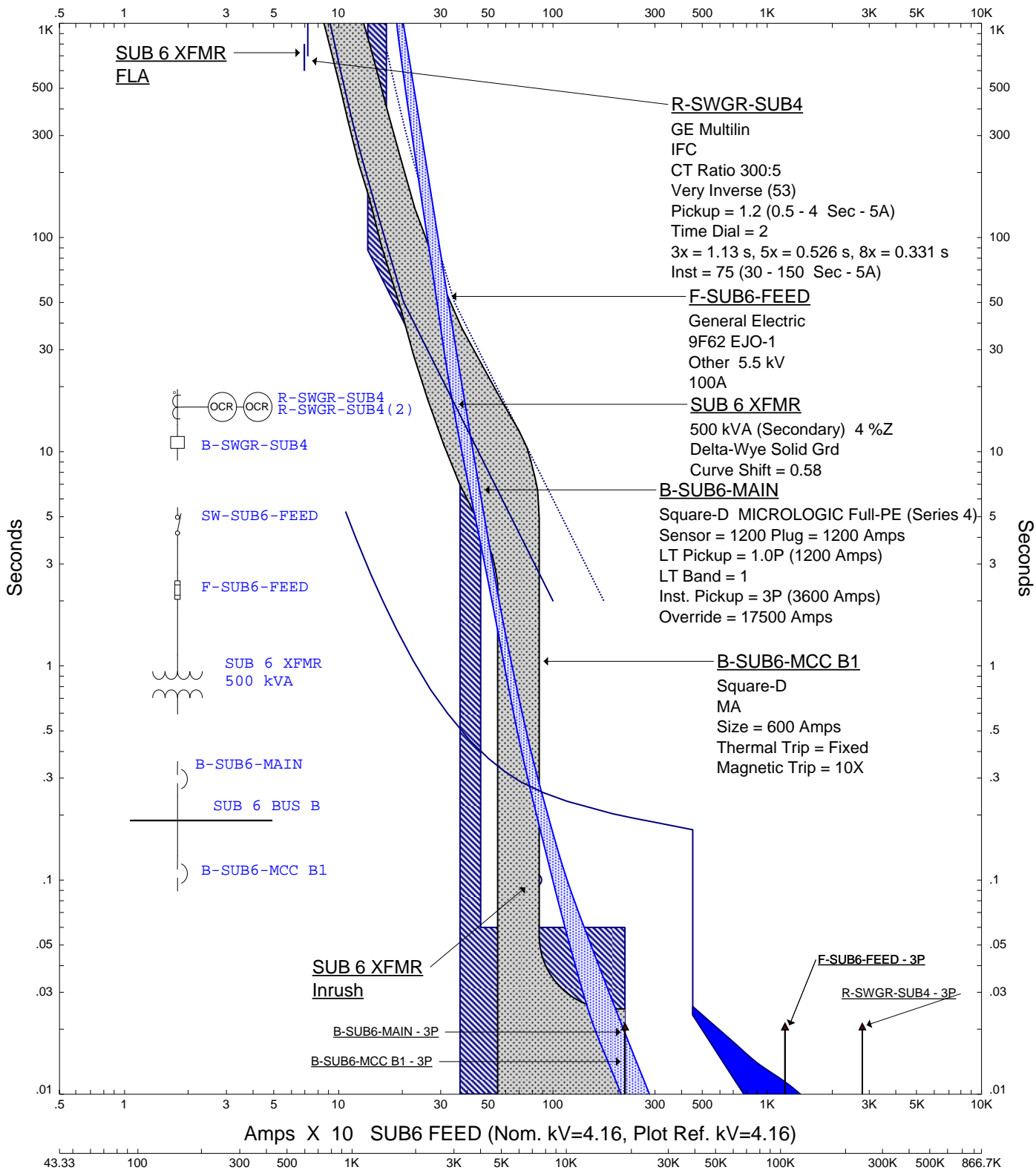


Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014



Amps X 10 SUB6 FEED (Nom. kV=4.16, Plot Ref. kV=4.16)



ETAP Star 12.6.0C

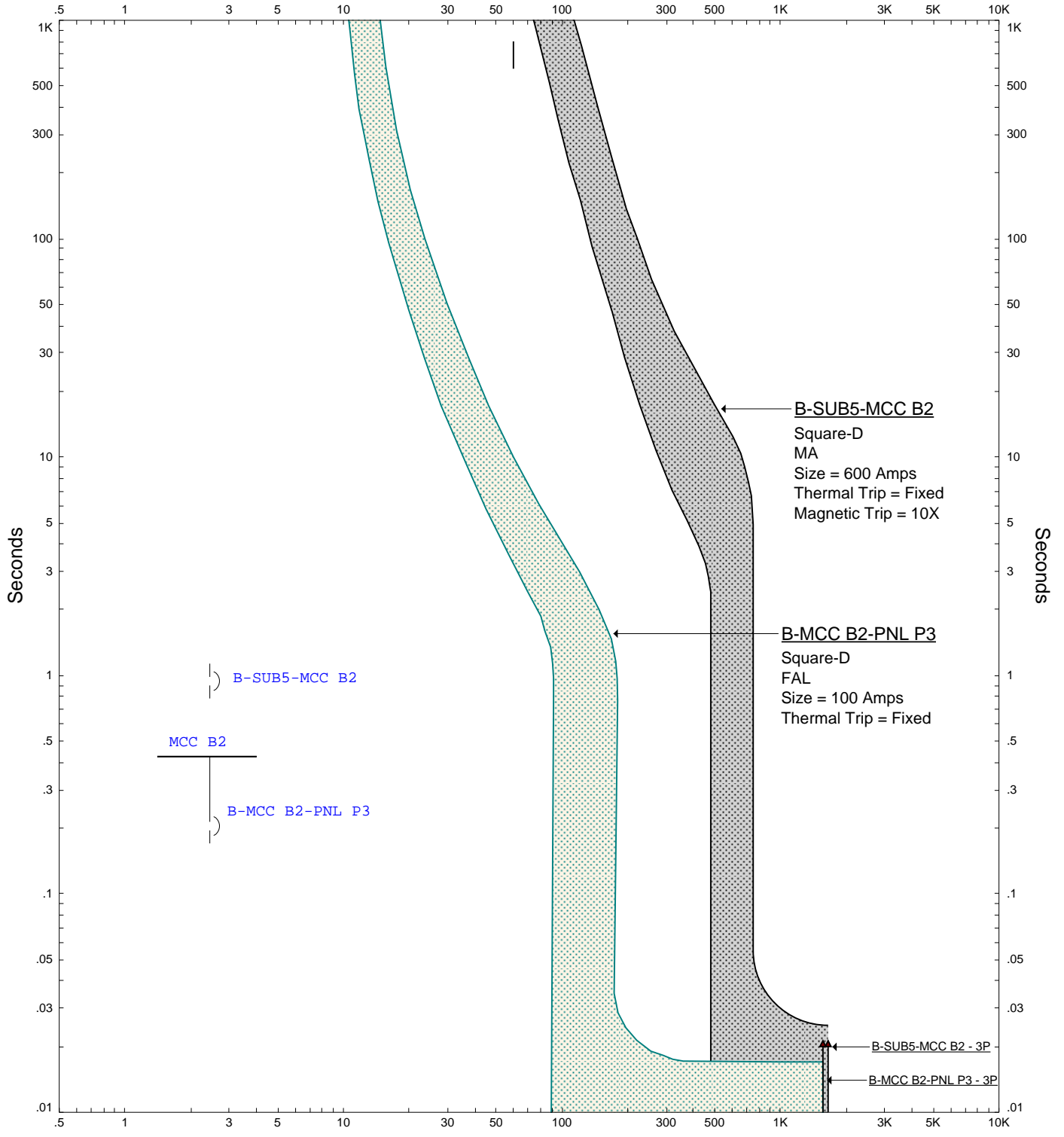
TCC 16:SWGR/SUB6/MCCB1



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW


Date: 04-28-2014

Amps X 10 MCC B2 (Nom. kV=0.48, Plot Ref. kV=0.48)



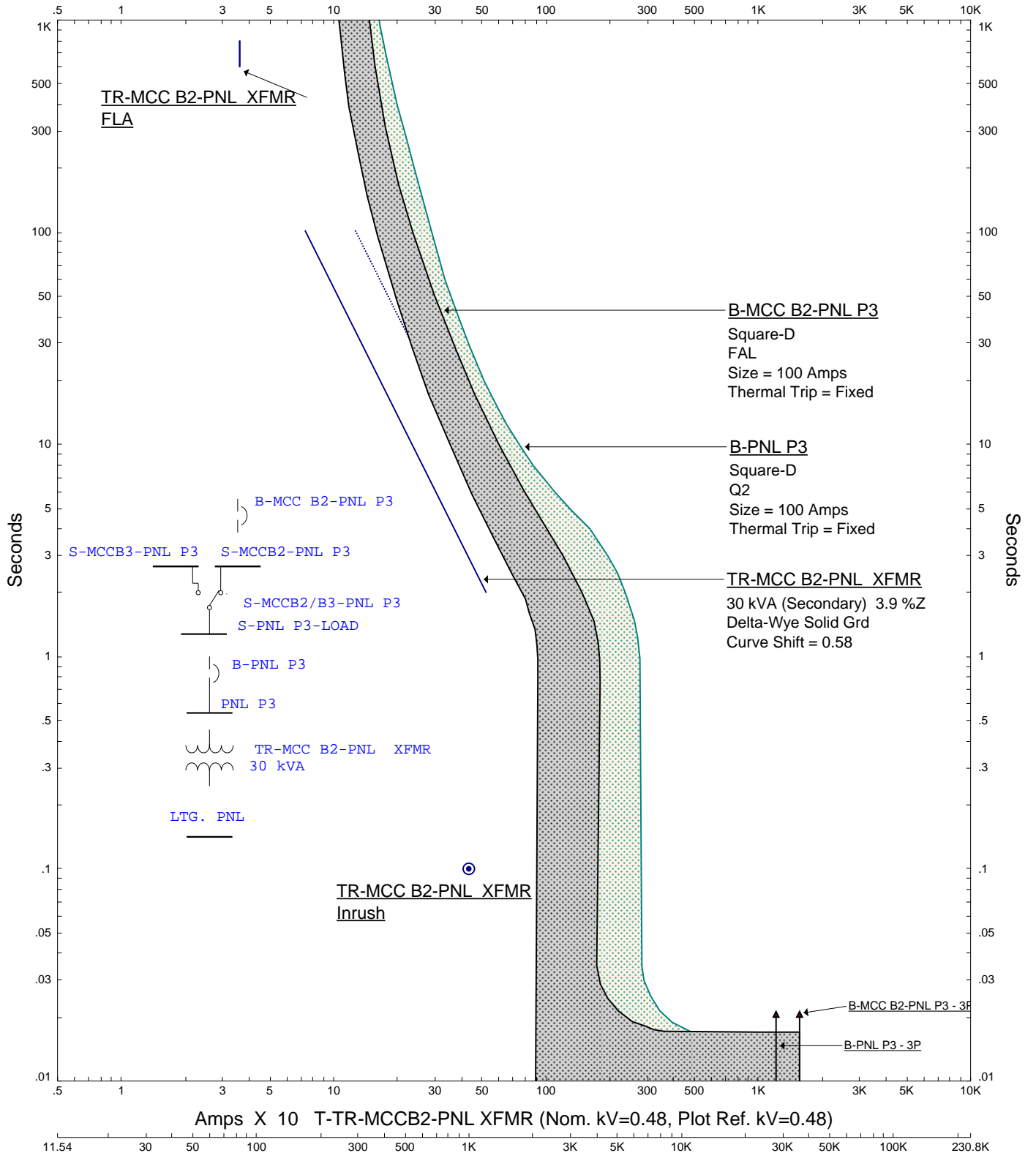
Amps X 10 MCC B2 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 17:SUB5/MCCB2/PNL P3</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: Swwrf Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014



Amps X 10 T-TR-MCCB2-PNL XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 T-TR-MCCB2-PNL XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)

Amps LTG. PNL (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

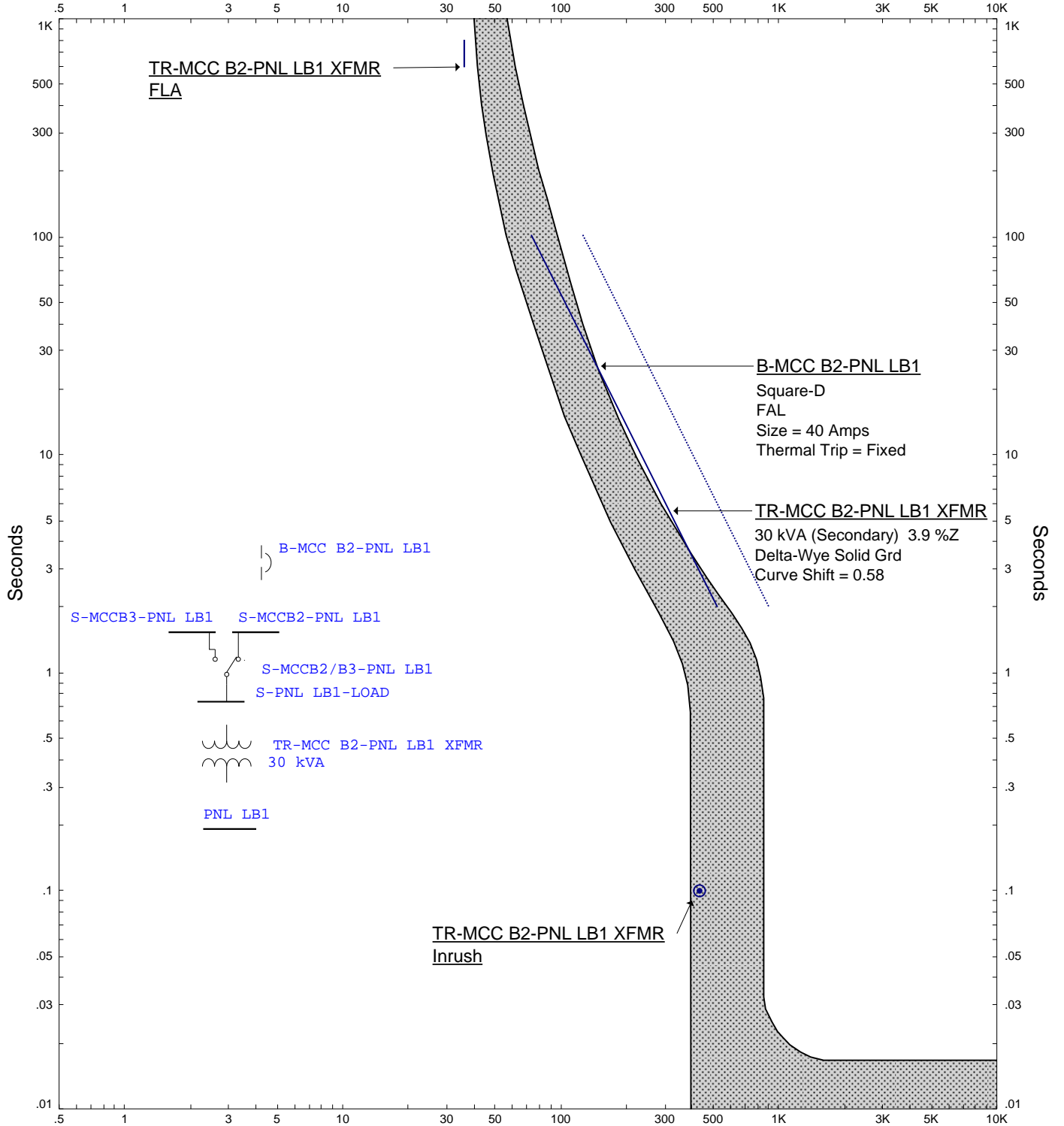
TCC 18:MCCB2/PNL P3



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014

Amps T-TR-MCCB2-PNL LB1 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps T-TR-MCCB2-PNL LB1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

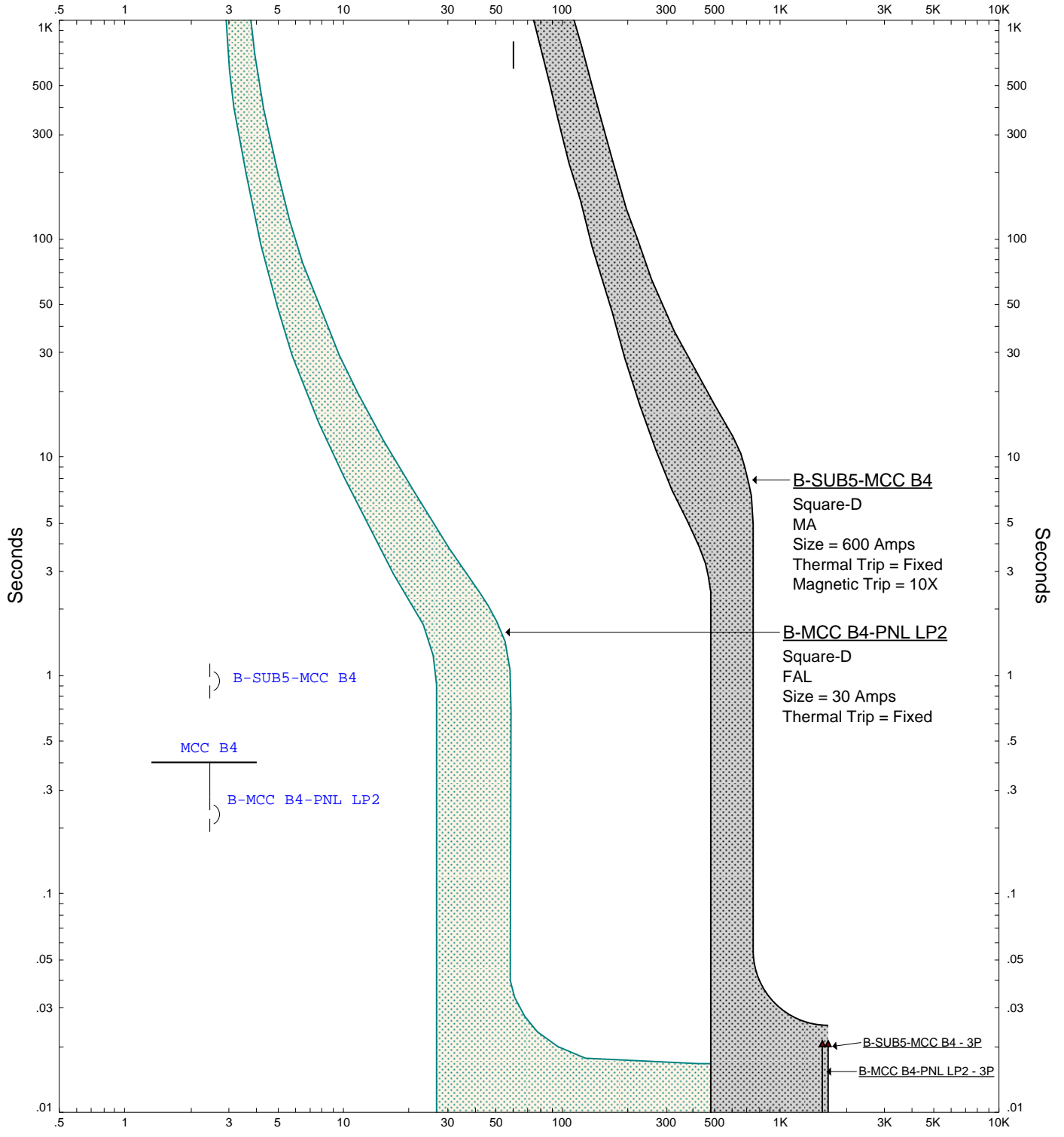
TCC 19:MCCB2/PNL LB1



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW


Date: 04-29-2014

Amps X 10 MCC B4 (Nom. kV=0.48, Plot Ref. kV=0.48)

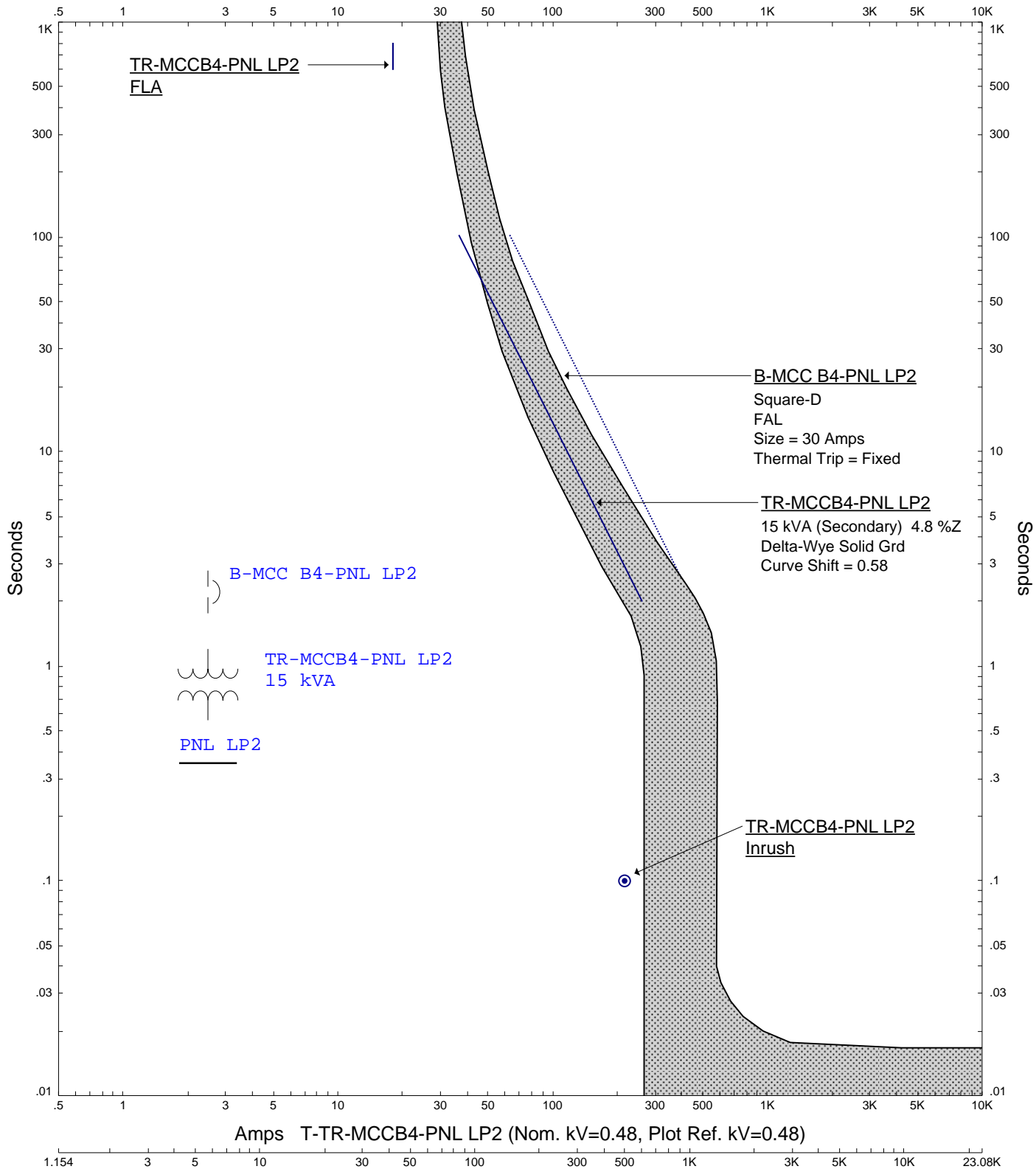


Amps X 10 MCC B4 (Nom. kV=0.48, Plot Ref. kV=0.48)


ETAP Star 12.6.0C

	<b>TCC 20:SUB5/MCCB4/PNL LP2</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: Swwrf Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

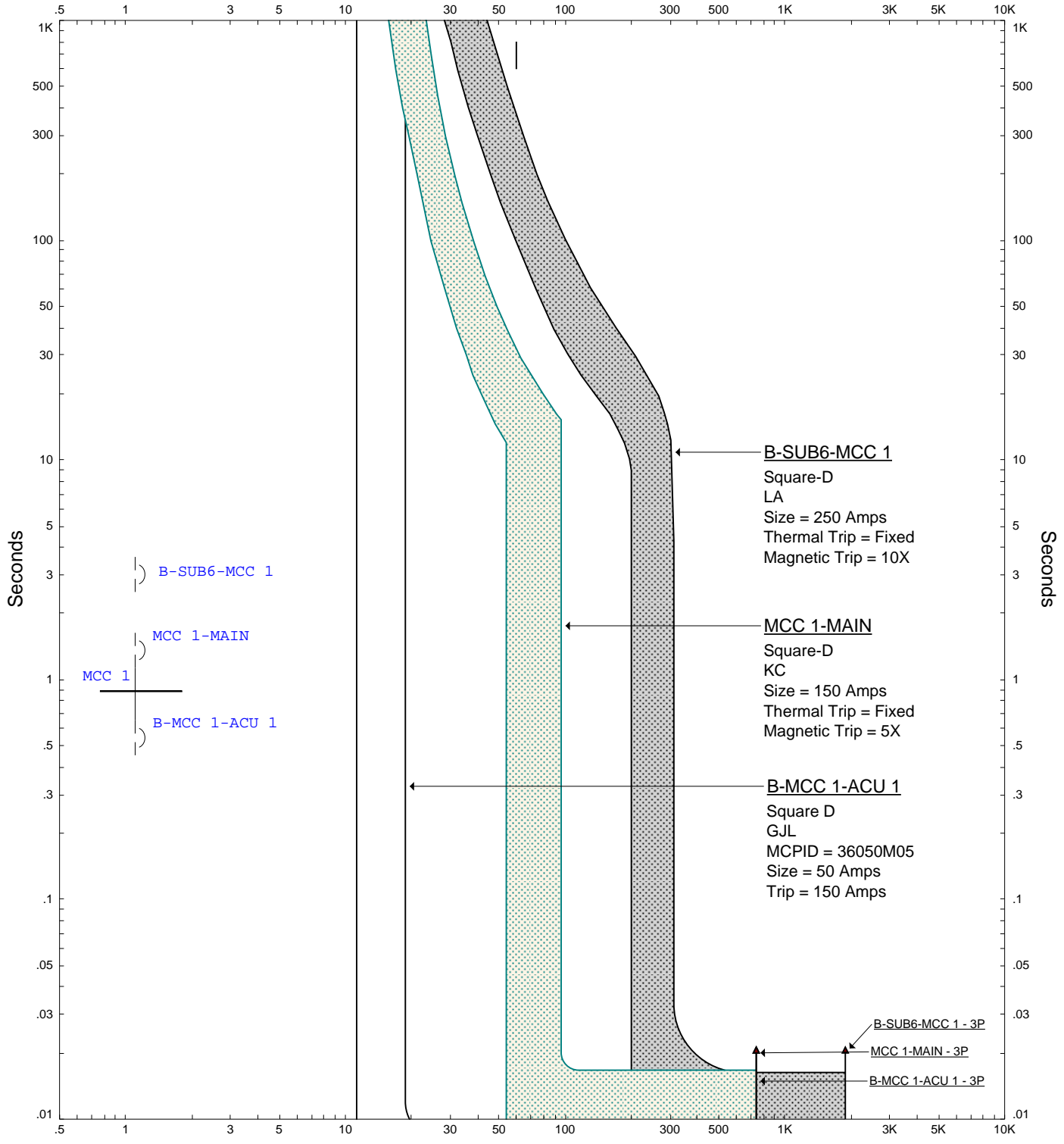
Amps T-TR-MCCB4-PNL LP2 (Nom. kV=0.48, Plot Ref. kV=0.48)



ETAP Star 12.6.0C

	<b>TCC 21:MCCB4/PNL LP2</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SwwRF Contract: 8910V.00 Engineer: KTW	Date: 04-29-2014	<b>171</b>

Amps X 10 MCC 1 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 MCC 1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

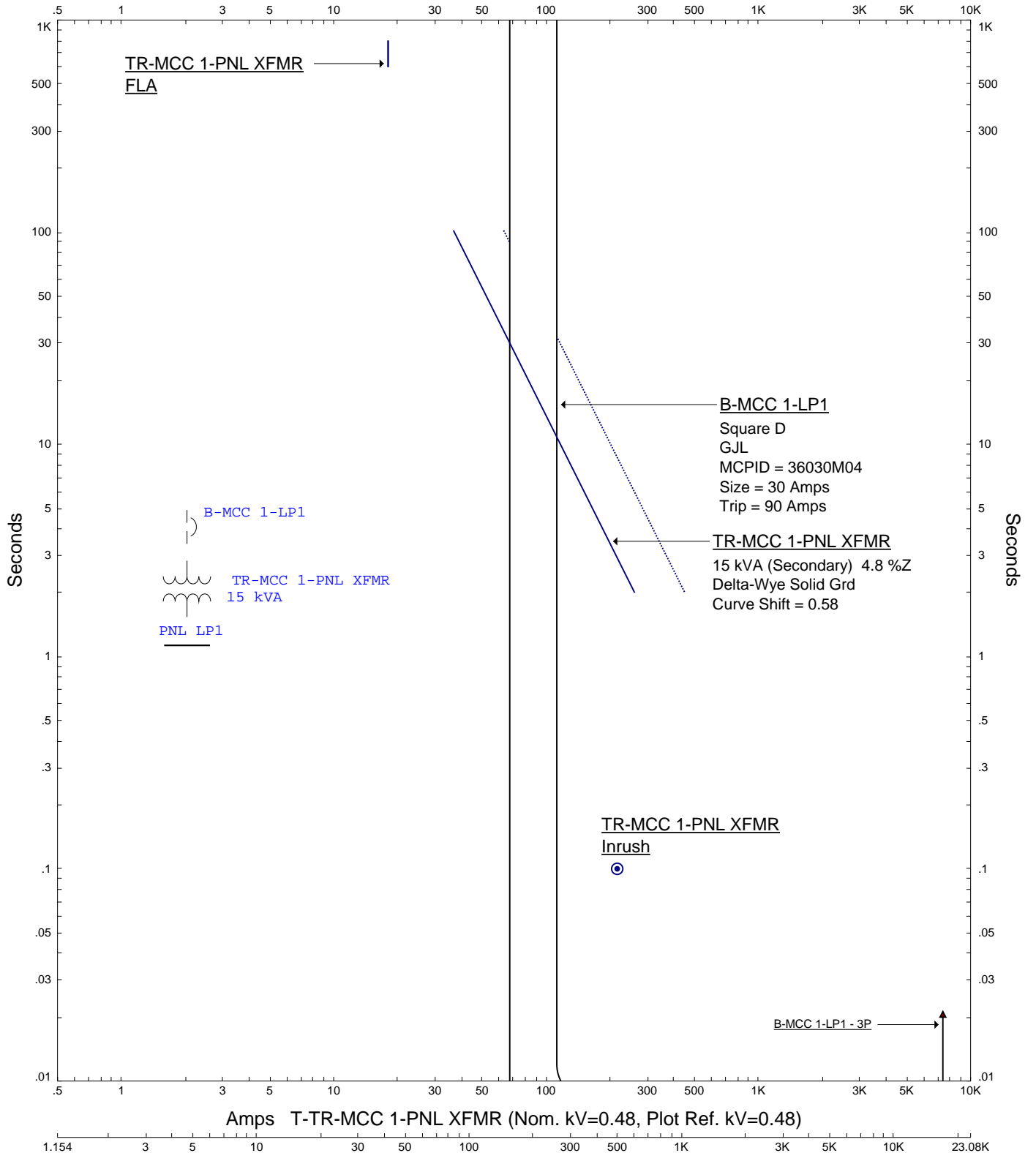
TCC 22:SUB6/MCC1/ACU



Project: MANATEE COUNTY ESS  
 Location: SwwRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014


Amps T-TR-MCC 1-PNL XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)



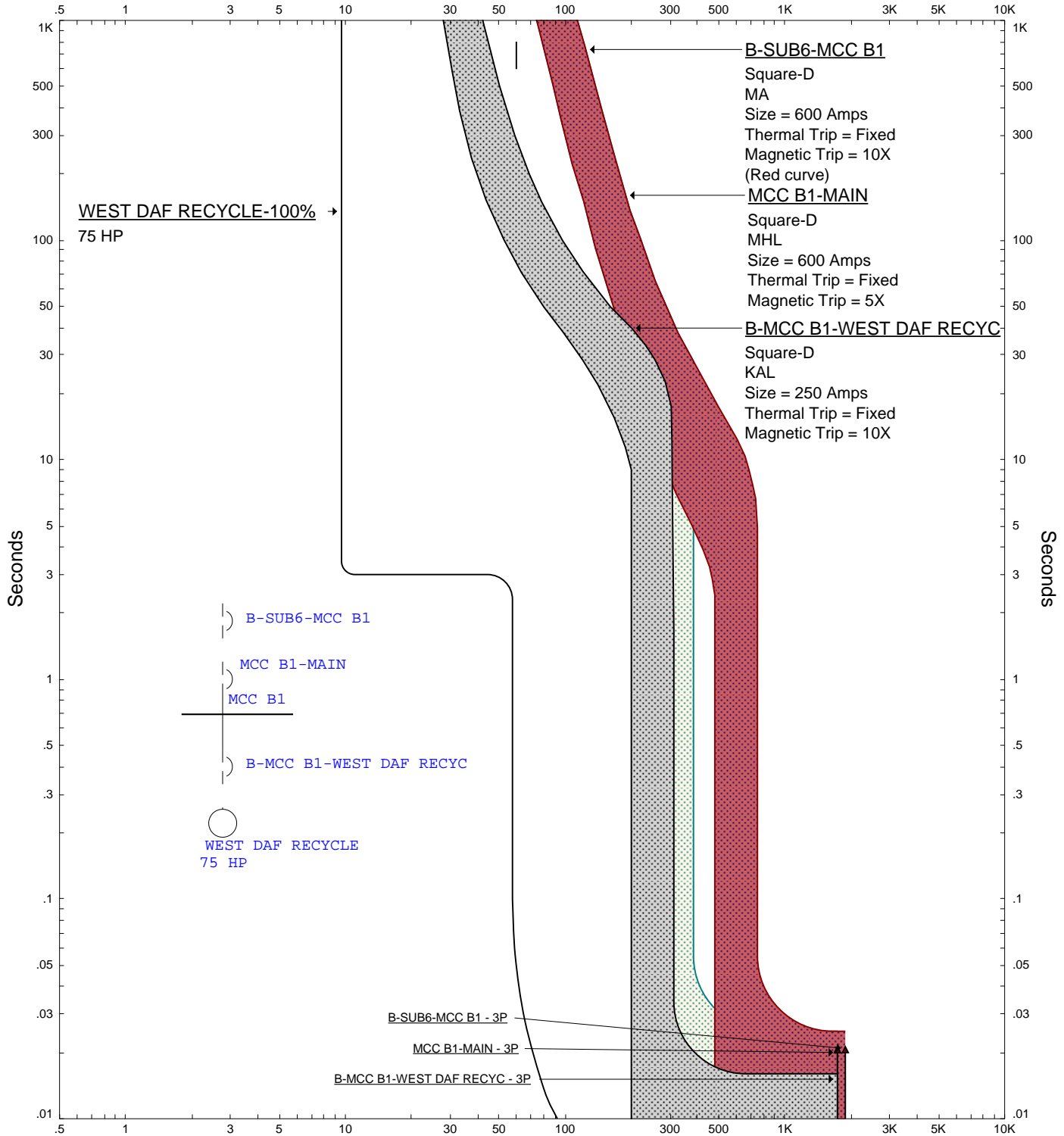
Amps T-TR-MCC 1-PNL XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)

Amps PNL LP1 (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C


	<p><b>TCC 23:MCC1/PNL LP1</b></p>	
<p>Project: MANATEE COUNTY ESS                  Location: SWWRF                  Contract: 8910V.00                  Engineer: KTW</p>		<p>Date: 04-29-2014</p> <p style="text-align: right;">173</p>

Amps X 10 MCC B1 (Nom. kV=0.48, Plot Ref. kV=0.48)

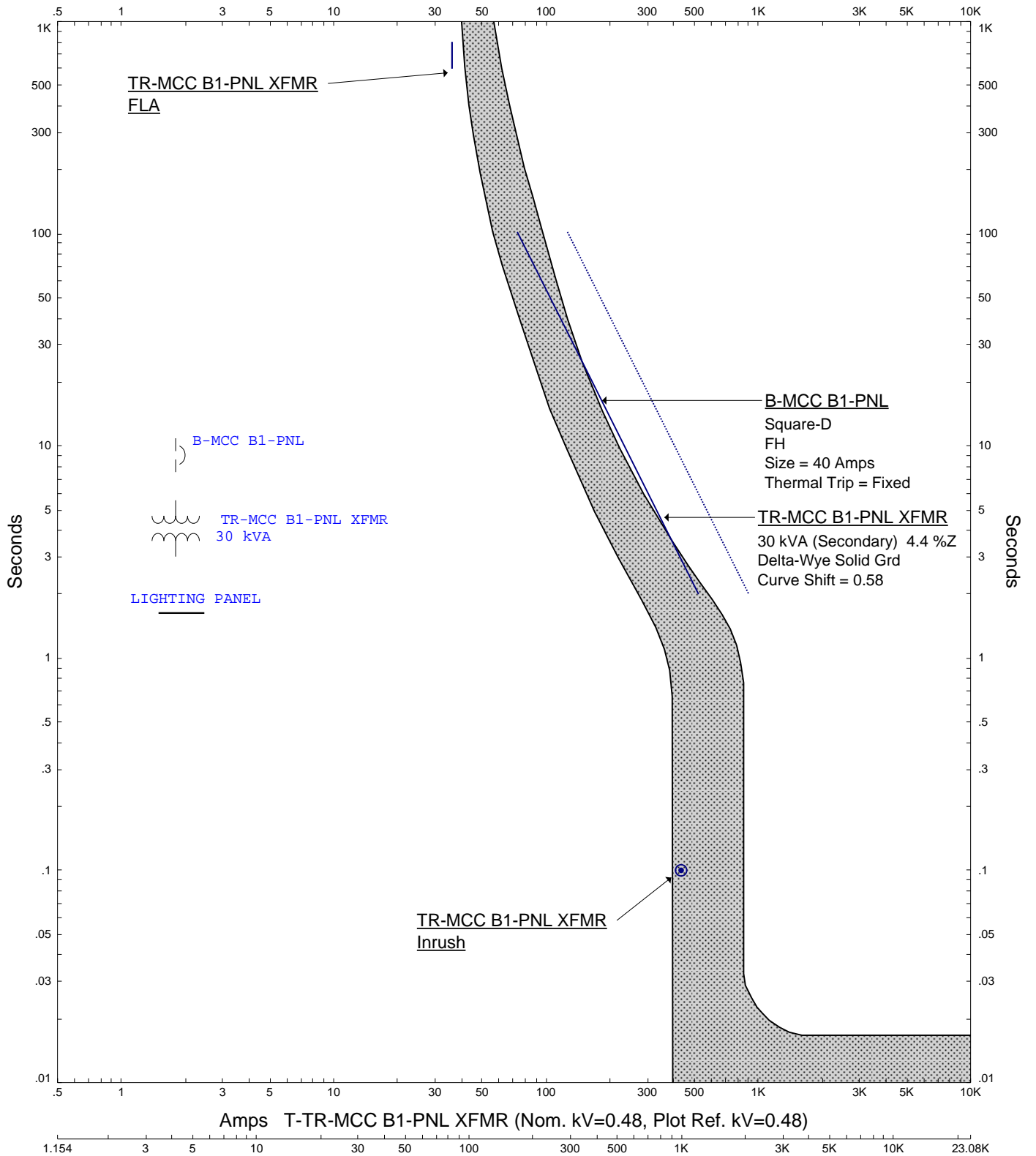


Amps X 10 MCC B1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 24:SUB6/MCCB1/W DAF</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SwwRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

Amps T-TR-MCC B1-PNL XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps LIGHTING PANEL (Nom. kV=0.208, Plot Ref. kV=0.208)

1.154 3 5 10 30 50 100 300 500 1K 3K 5K 10K 23.08K

ETAP Star 12.6.0C

TCC 25:MCCB1/PNL

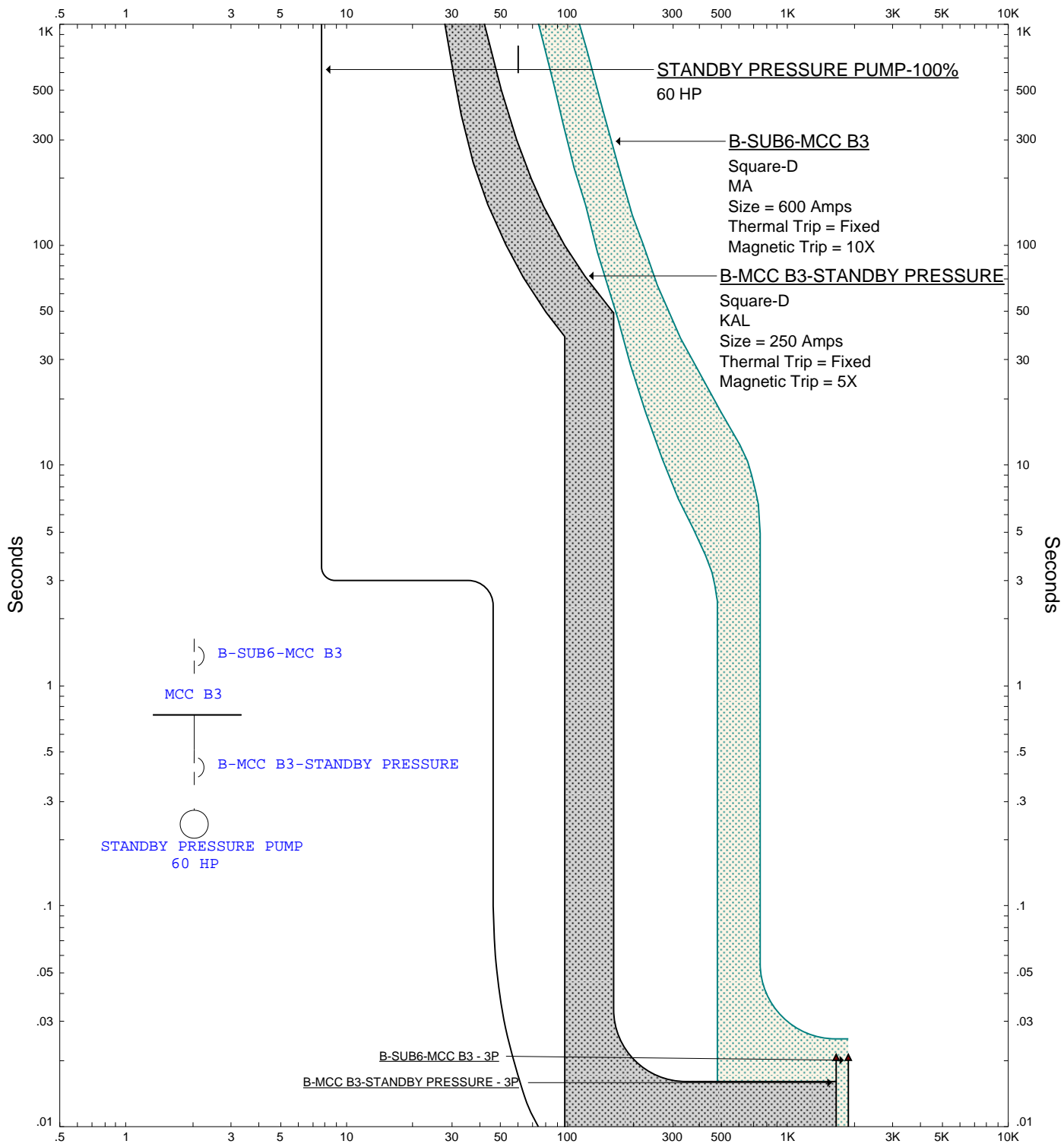


Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014



Amps X 10 SUB 6 BUS B (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 SUB 6 BUS B (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

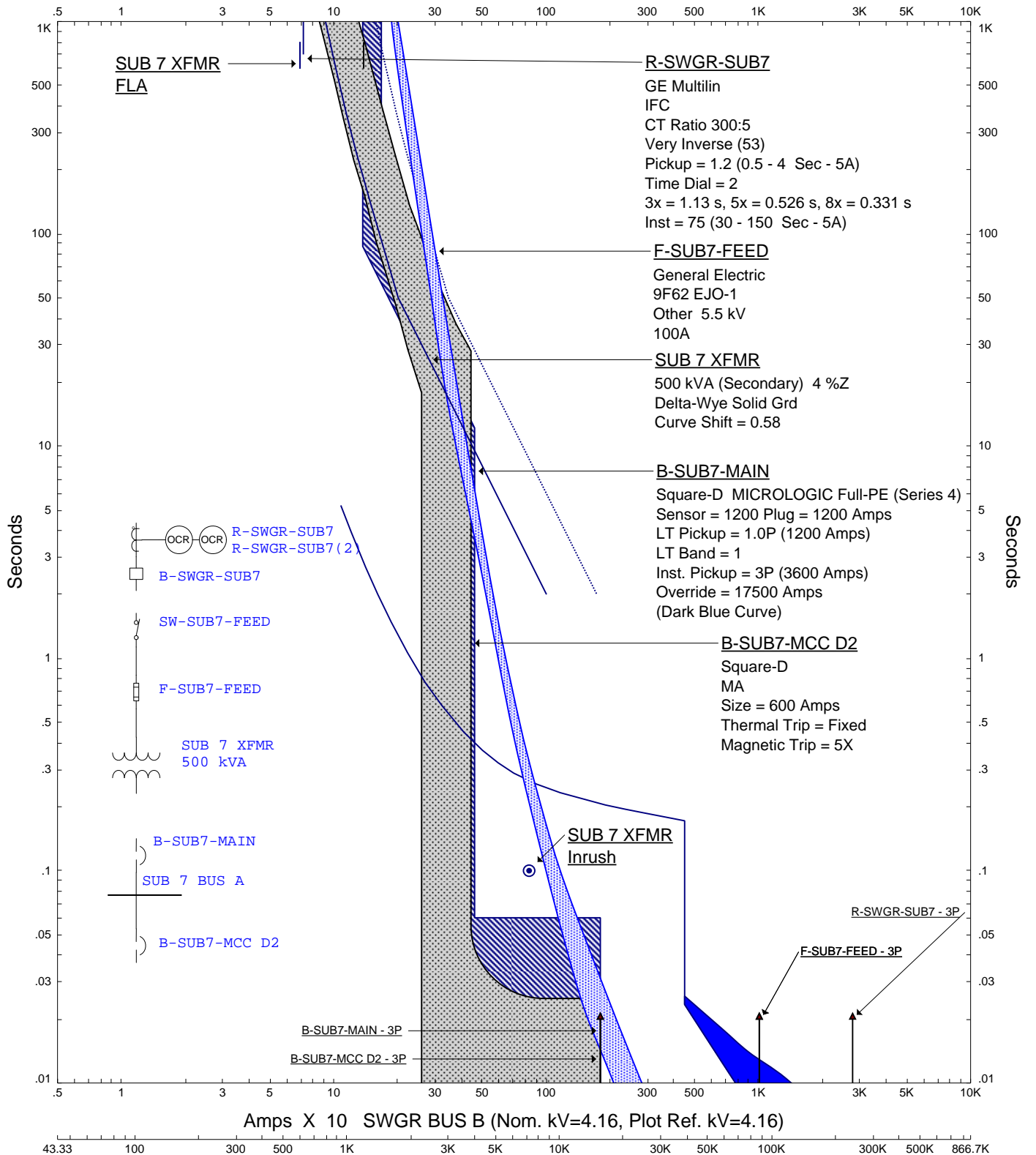
TCC 26:SUB6/MCCB3/STBY



Project: MANATEE COUNTY ESS  
Location: SwwRF  
Contract: 8910V.00  
Engineer: KTW

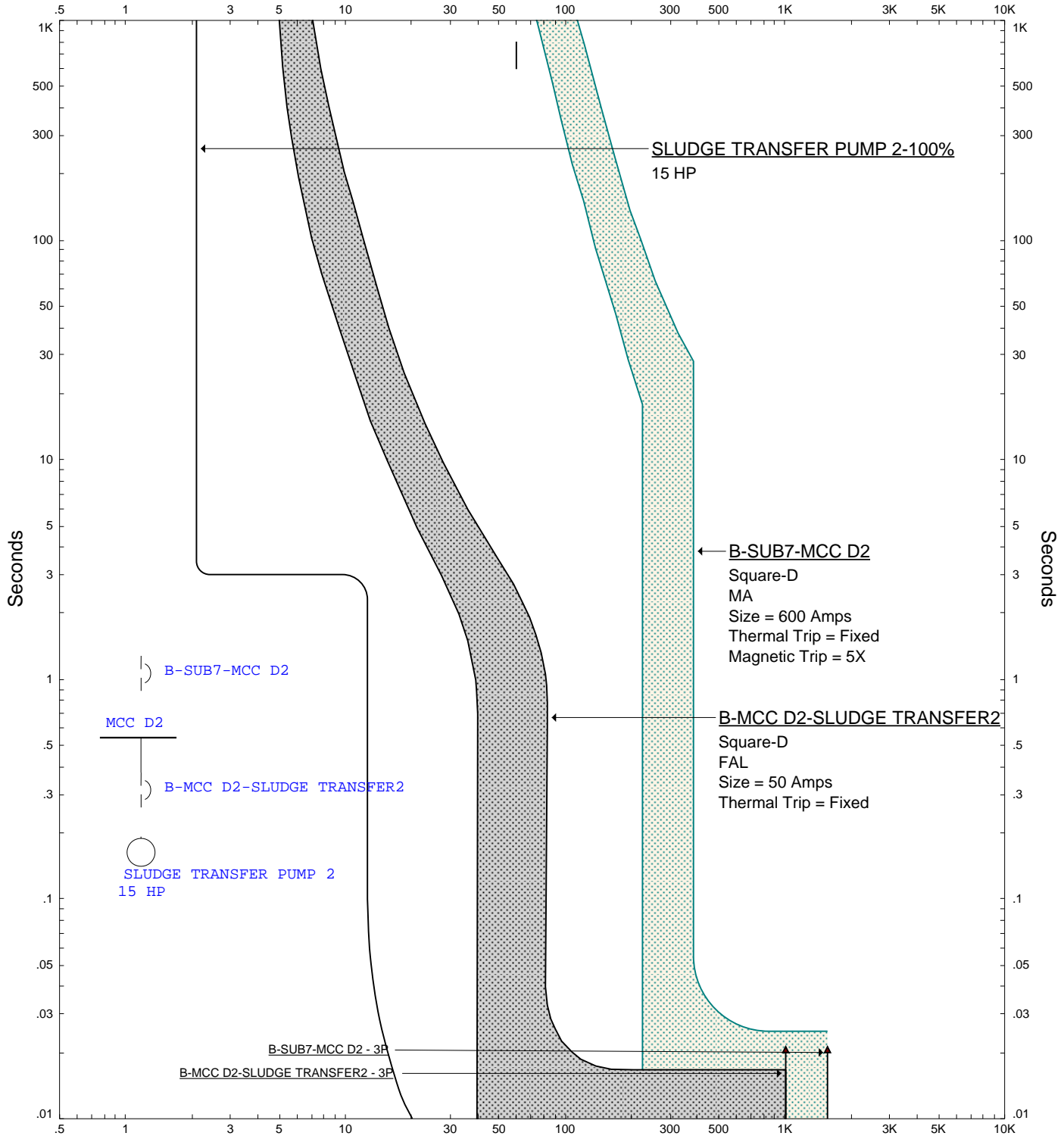
Date: 04-29-2014

Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)




	<b>TCC 27:SWGR/SUB7/MCCD2</b>	ETAP Star 12.6.0C
<p style="font-size: small; margin: 0;">Engineers...Working Wonders With Water™</p>		
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW	Date: 04-29-2014	177

Amps X 10 MCC D2 (Nom. kV=0.48, Plot Ref. kV=0.48)

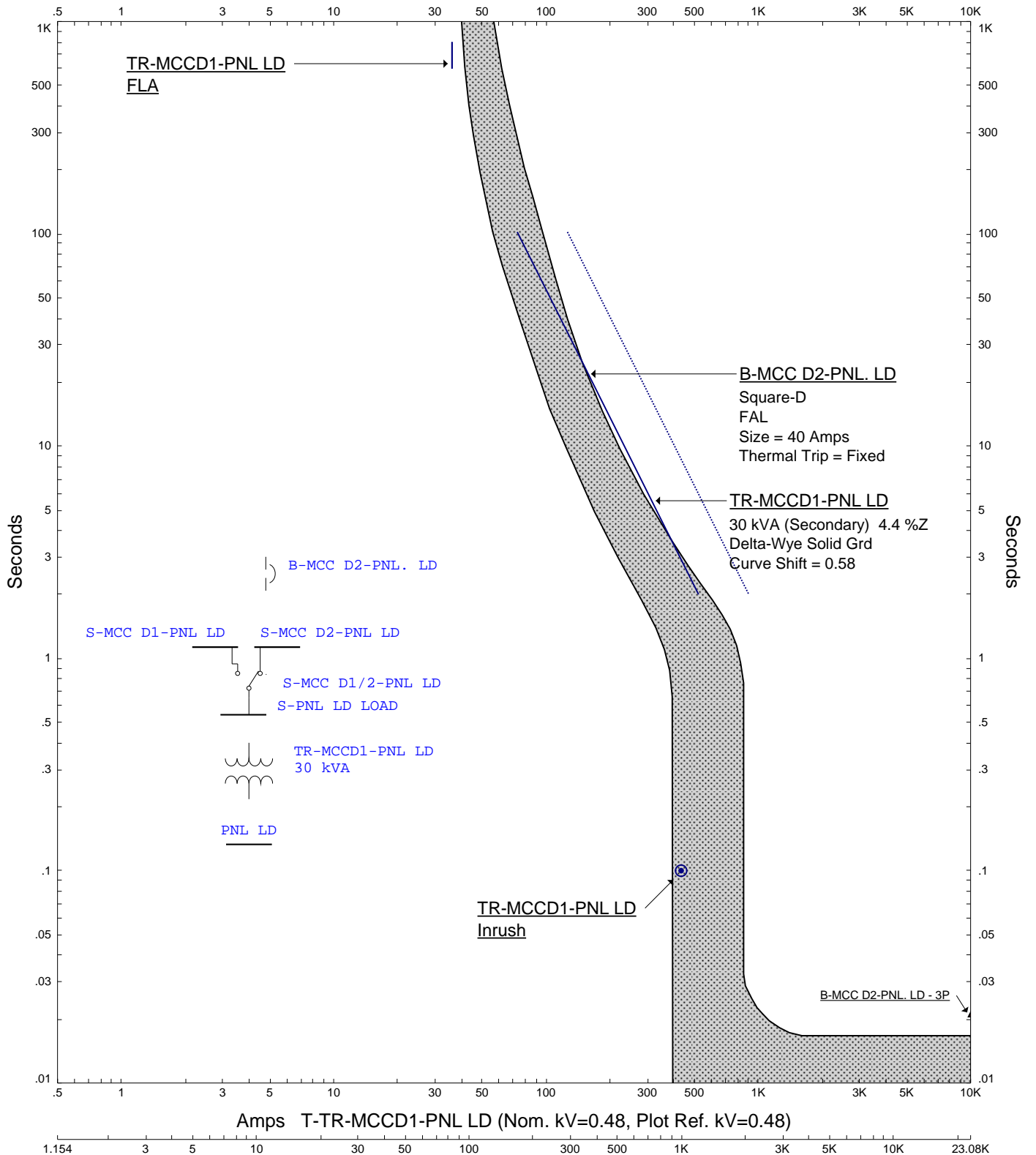


Amps X 10 MCC D2 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 28:SUB7/MCCD2/SLDG</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SwwRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

Amps T-TR-MCCD1-PNL LD (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps T-TR-MCCD1-PNL LD (Nom. kV=0.48, Plot Ref. kV=0.48)

Amps PNL LD (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

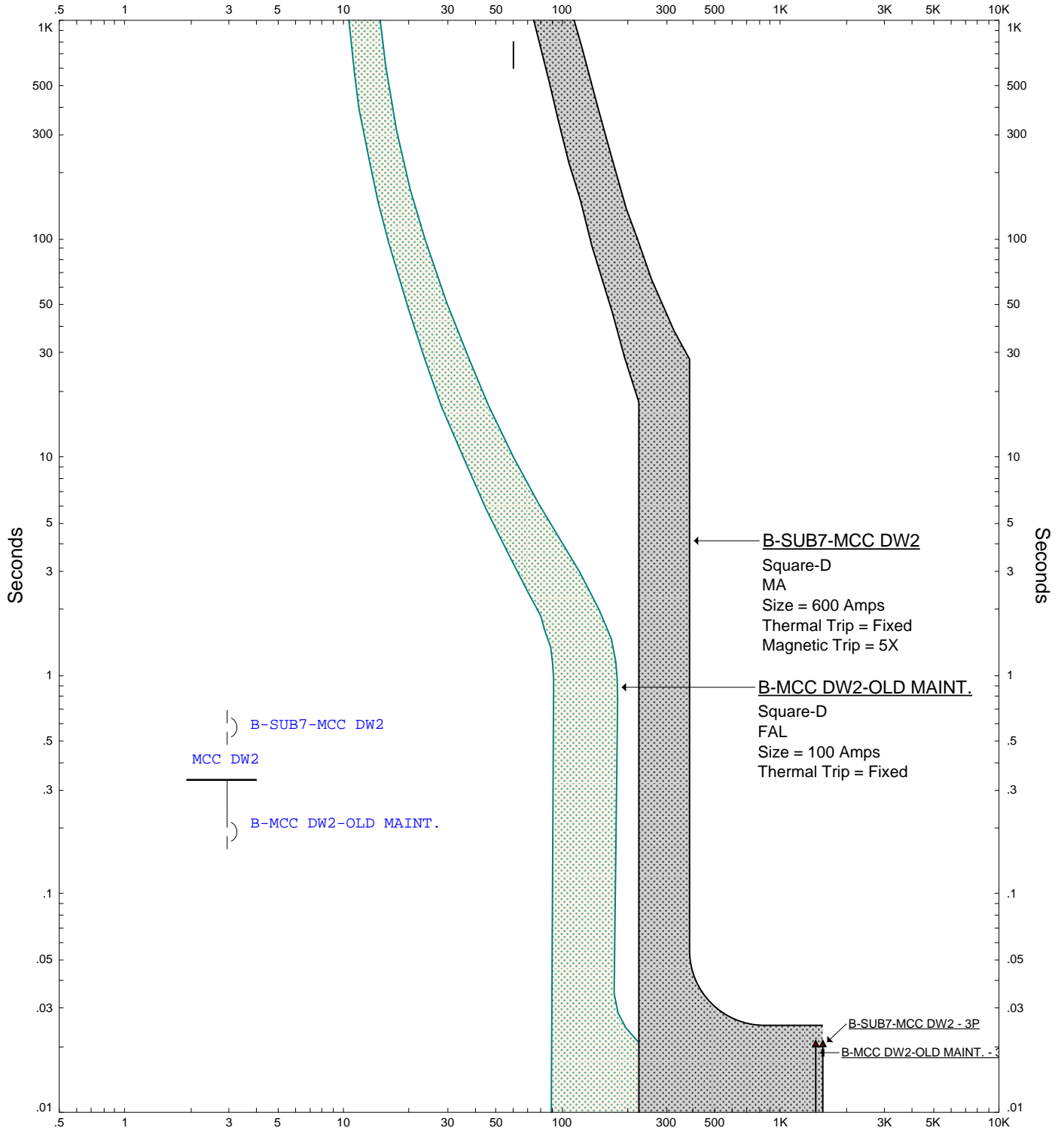
TCC 29:MCCD2/PNL LD



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW


Date: 04-29-2014

Amps X 10 MCC DW2 (Nom. kV=0.48, Plot Ref. kV=0.48)

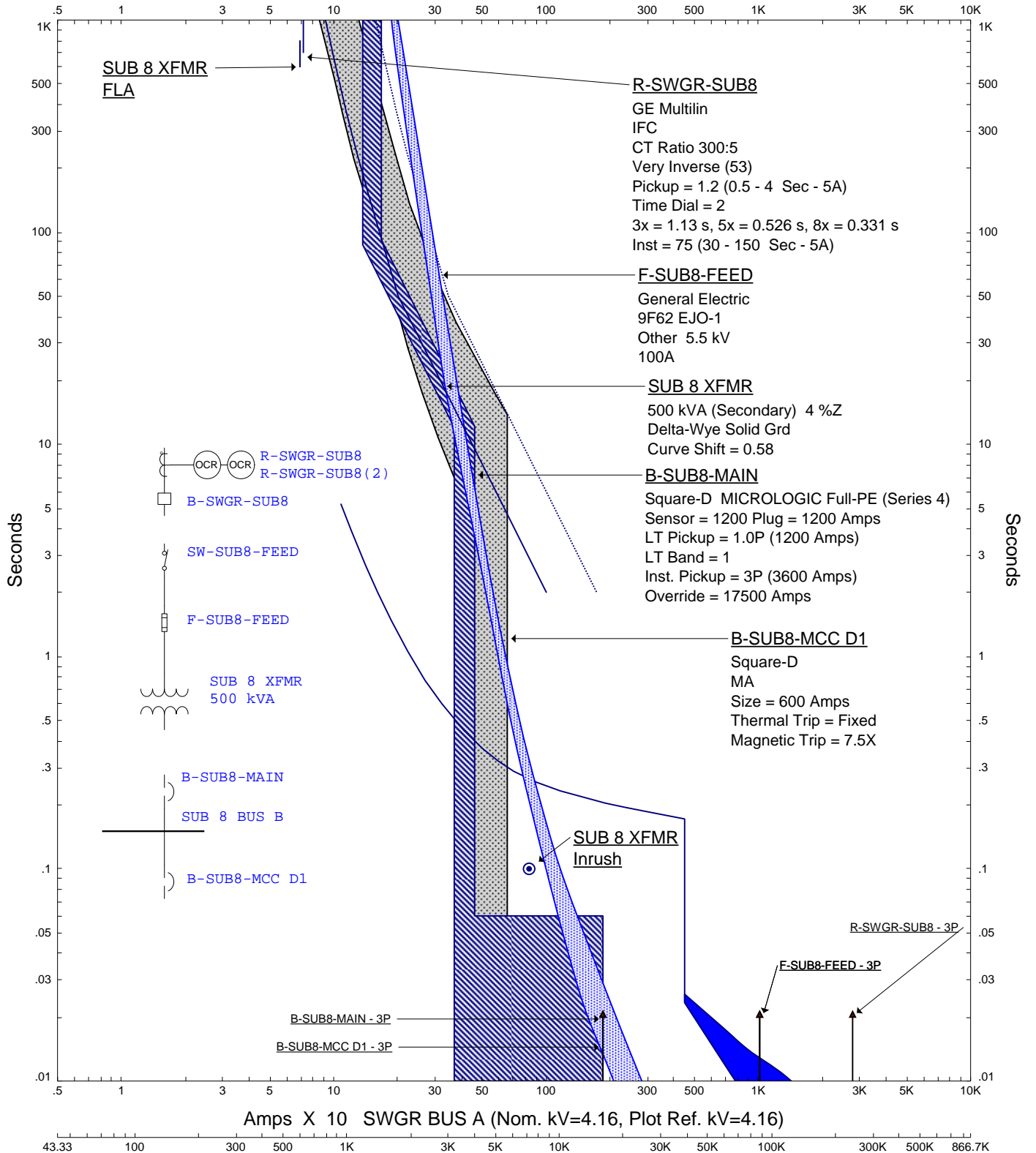


Amps X 10 MCC DW2 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 30:SUB7/MCCDW2/MAINT</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: Swwrf Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)

Amps SUB 8 BUS B (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

TCC 31:SWGR/SUB8/MCCD1

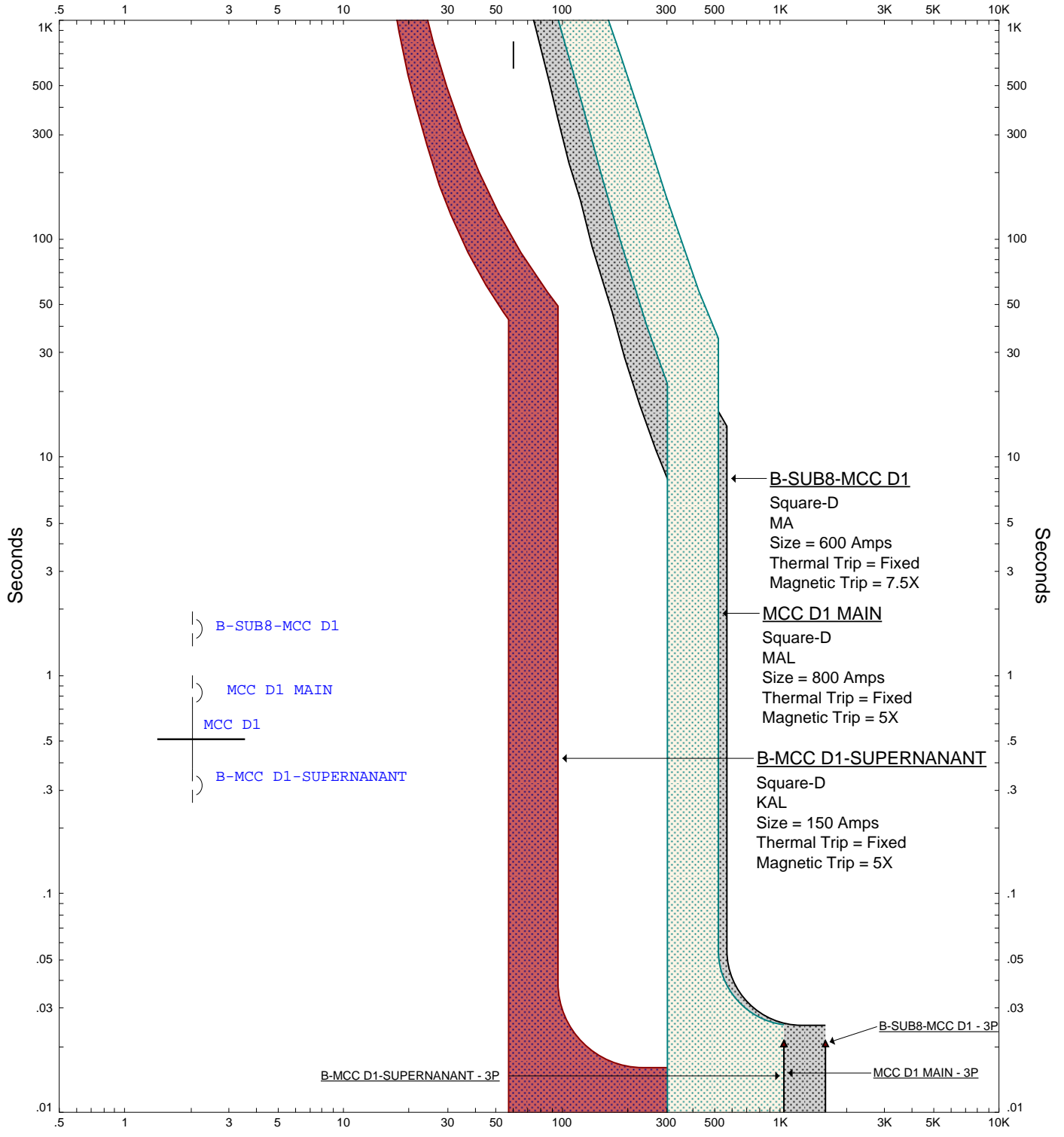


Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014




Amps X 10 MCC D1 (Nom. kV=0.48, Plot Ref. kV=0.48)

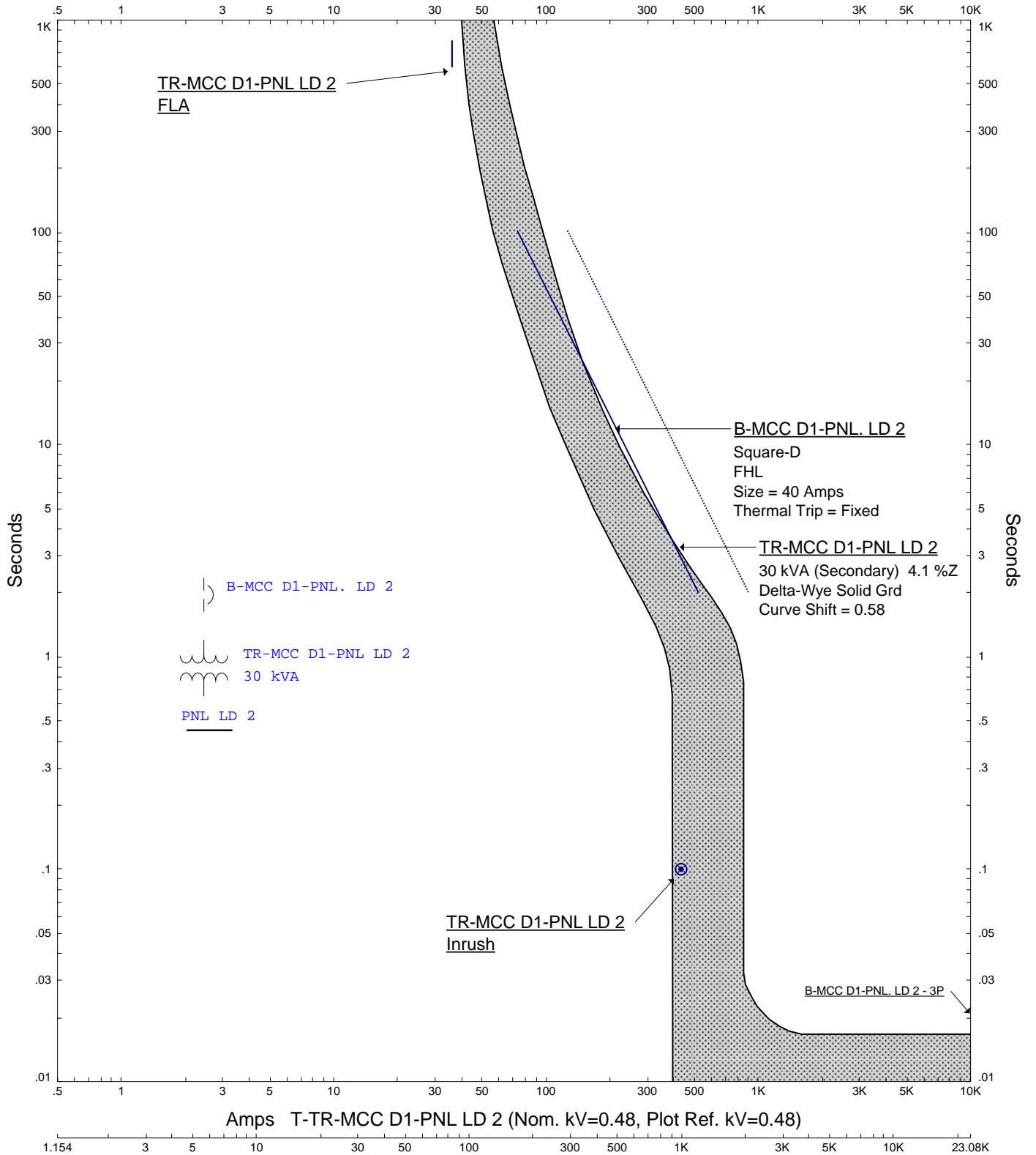


Amps X 10 MCC D1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C


	<b>TCC 32:SUB8/MCCD1/SUPER</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

Amps T-TR-MCC D1-PNL LD 2 (Nom. kV=0.48, Plot Ref. kV=0.48)



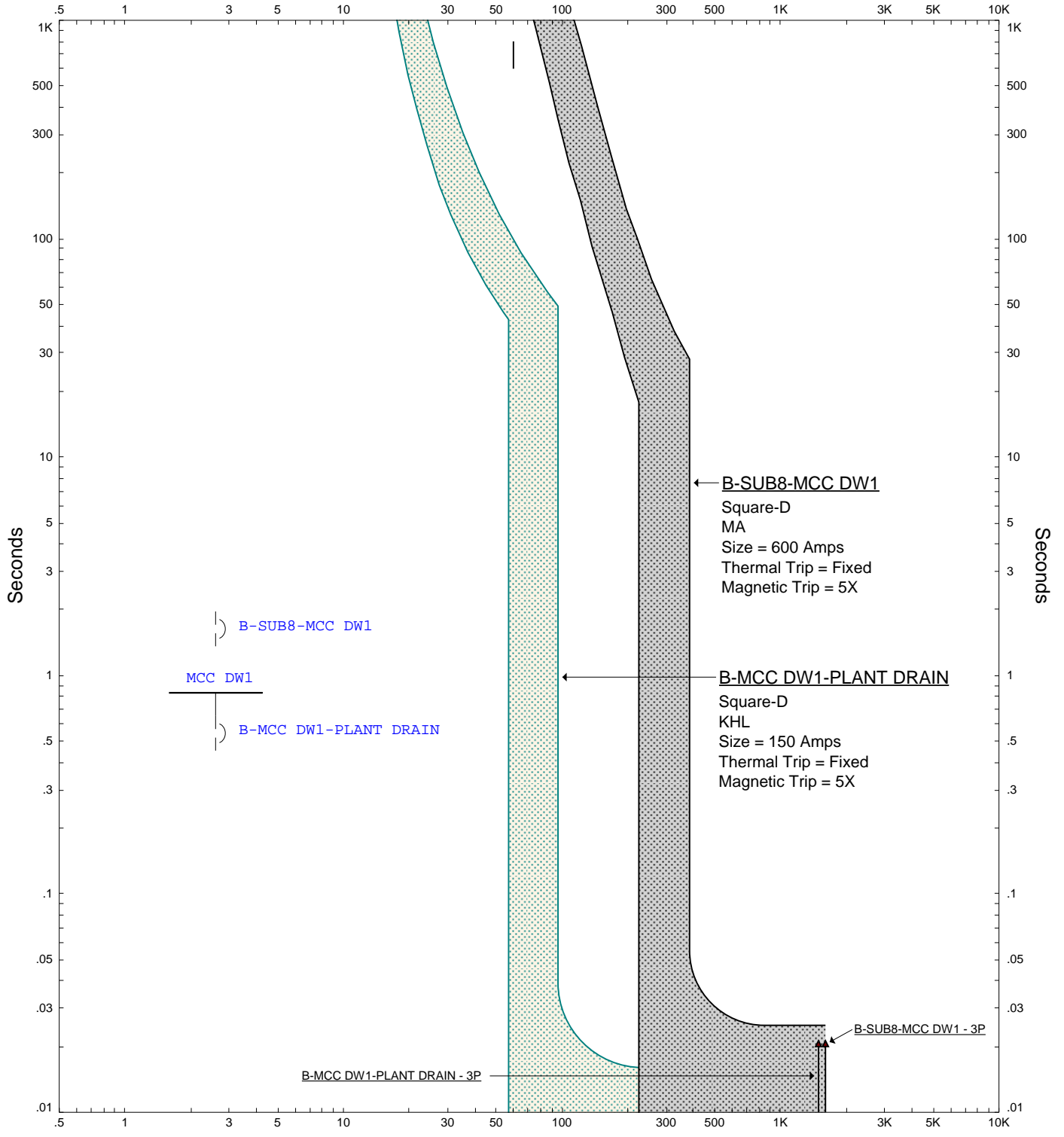
Amps PNL LD 2 (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

	<b>TCC 33:MCCD1/PNL LD2</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014



Amps X 10 MCC DW1 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 MCC DW1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

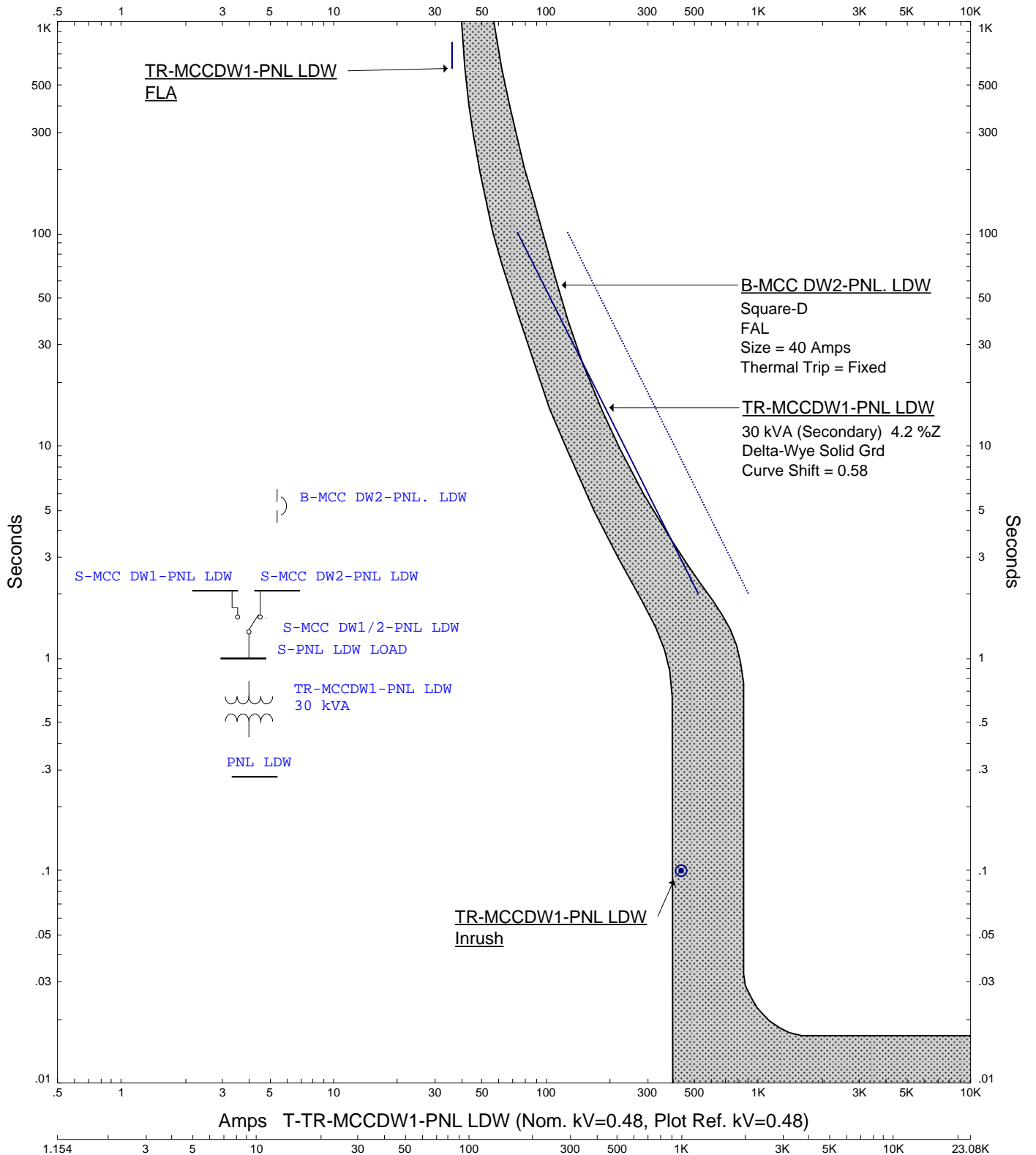
TCC 34:SUB8/MCCDW1/DRAIN



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

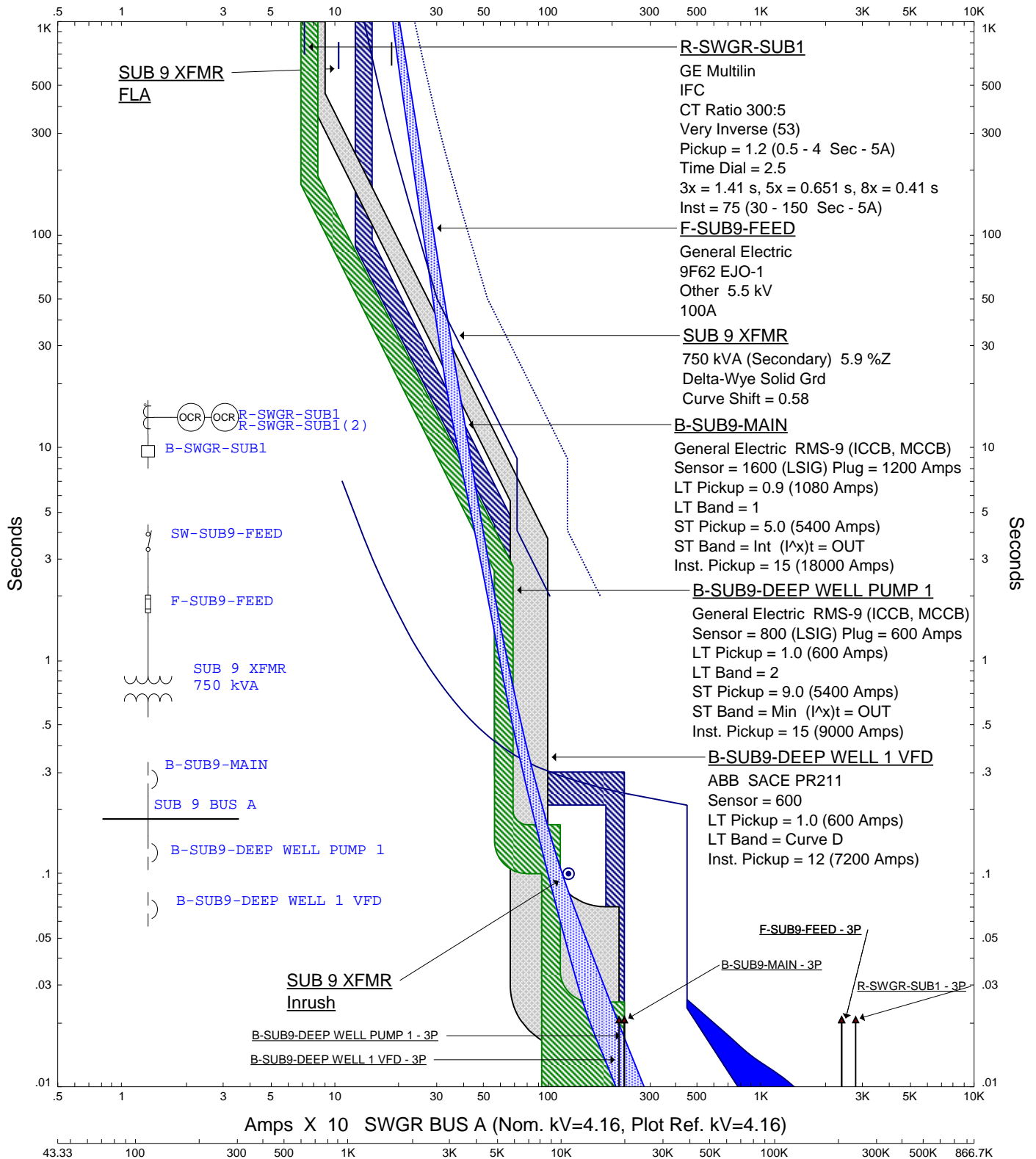
Date: 04-29-2014

Amps T-TR-MCCDW1-PNL LDW (Nom. kV=0.48, Plot Ref. kV=0.48)



	<b>TCC 35:MCCDW2/PNL LDW</b>	ETAP Star 12.6.0C
 Engineers...Working Wonders With Water™		
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW	Date: 04-29-2014	<b>185</b>

Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)

43.33 100 300 500 1K 3K 5K 10K 30K 50K 100K 300K 500K 866.7K

Amps SUB 9 BUS A (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

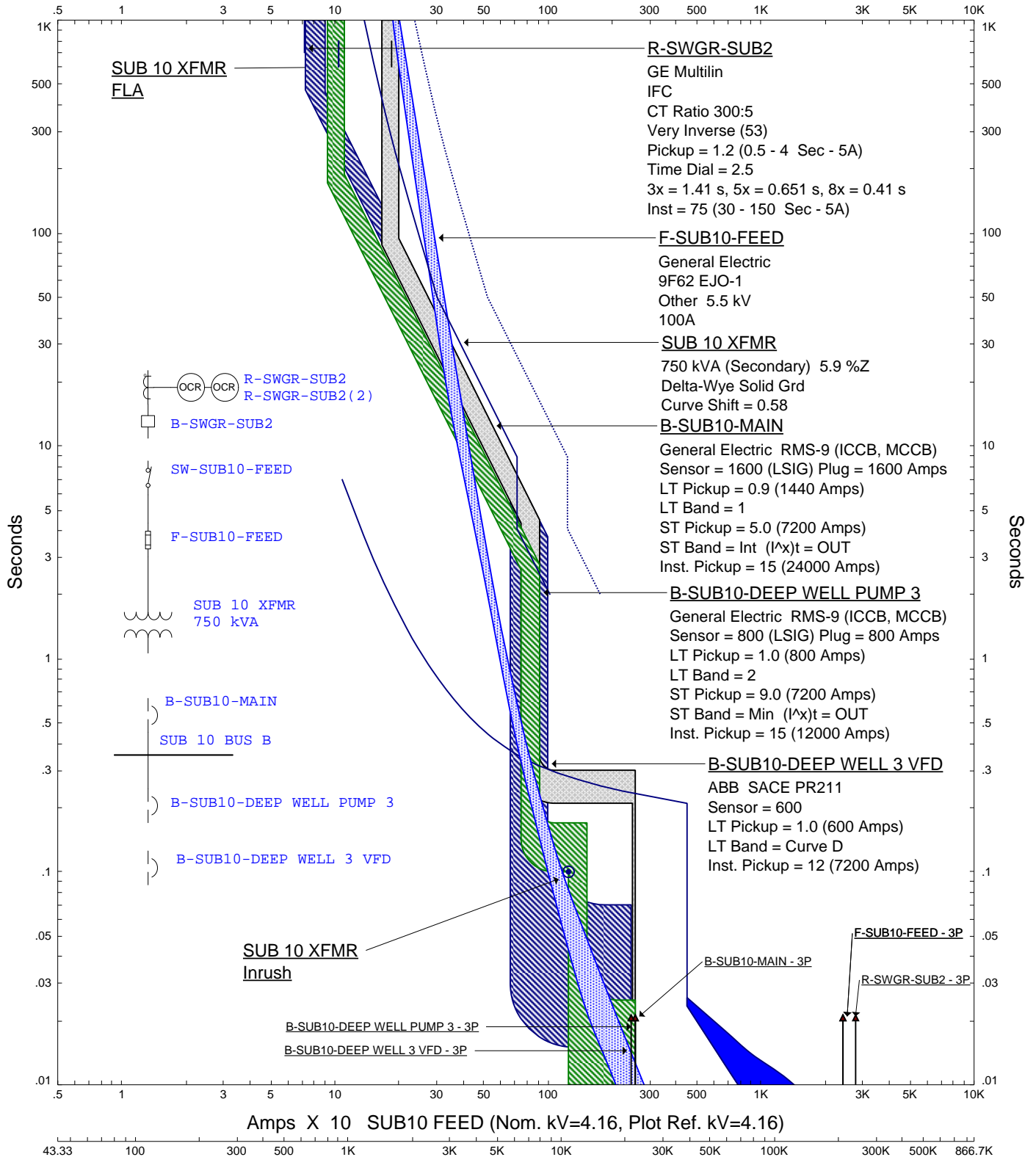
TCC 36:SWGR/SUB9/VFD




Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

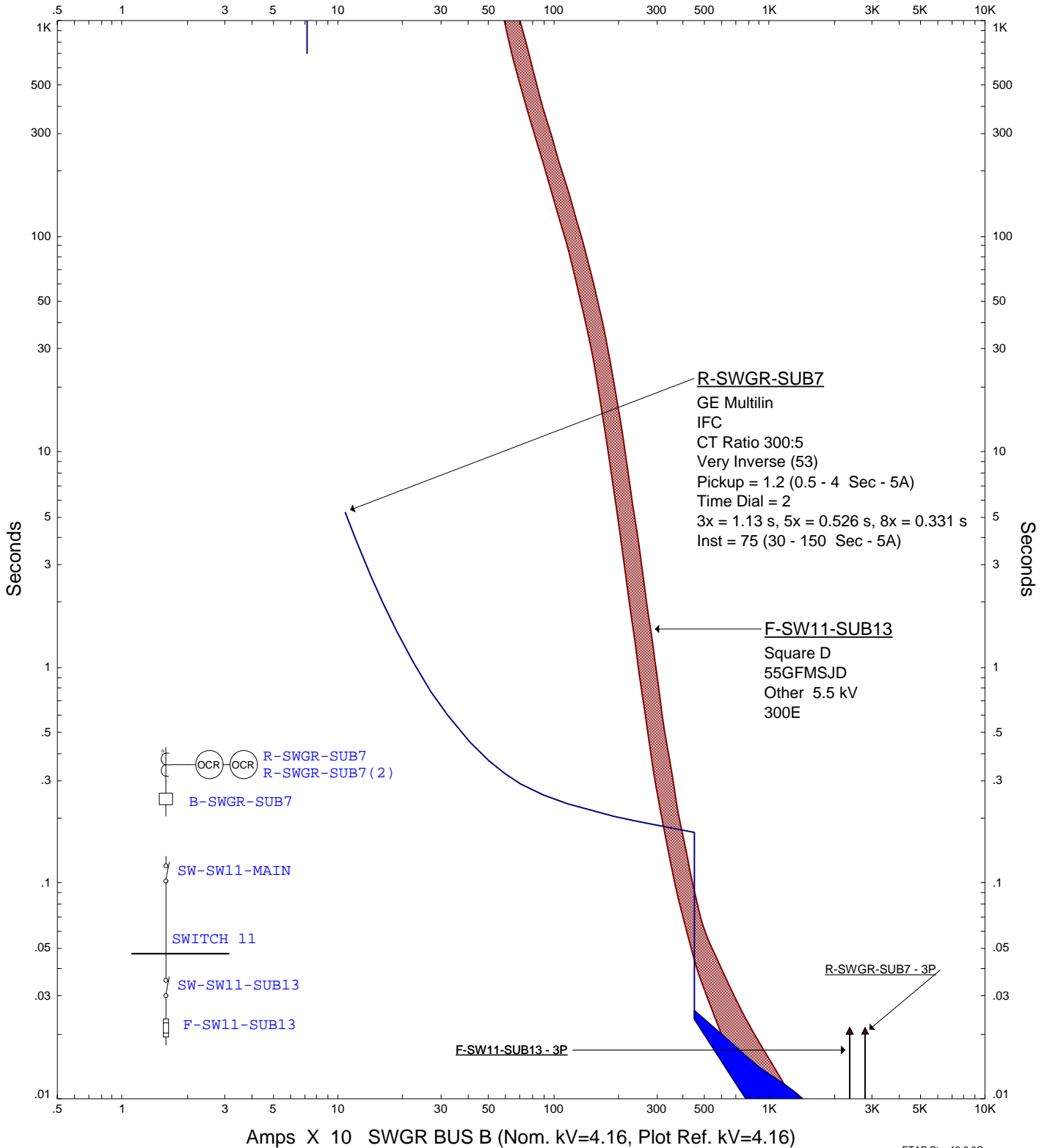
Date: 04-29-2014

Amps X 10 SUB10 FEED (Nom. kV=4.16, Plot Ref. kV=4.16)




<b>TCC 37:SWGR/SUB10/VFD</b>		ETAP Star 12.6.0C
		
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW	Date: 04-29-2014	

Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)

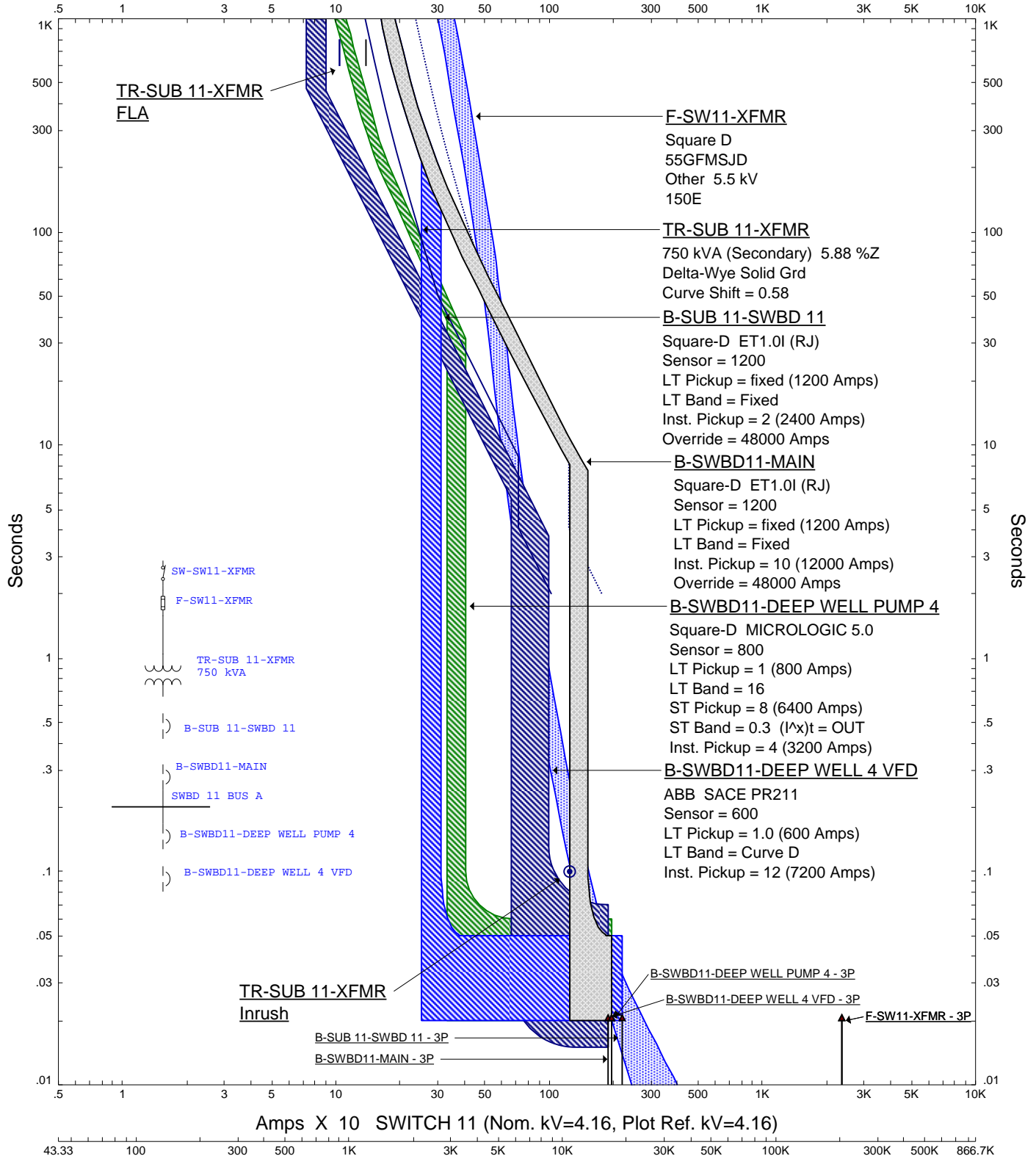


Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)

ETAP Star 12.6.0C


	<b>TCC 38:SWGR/SW11/SUB13</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

Amps X 10 SWITCH 11 (Nom. kV=4.16, Plot Ref. kV=4.16)



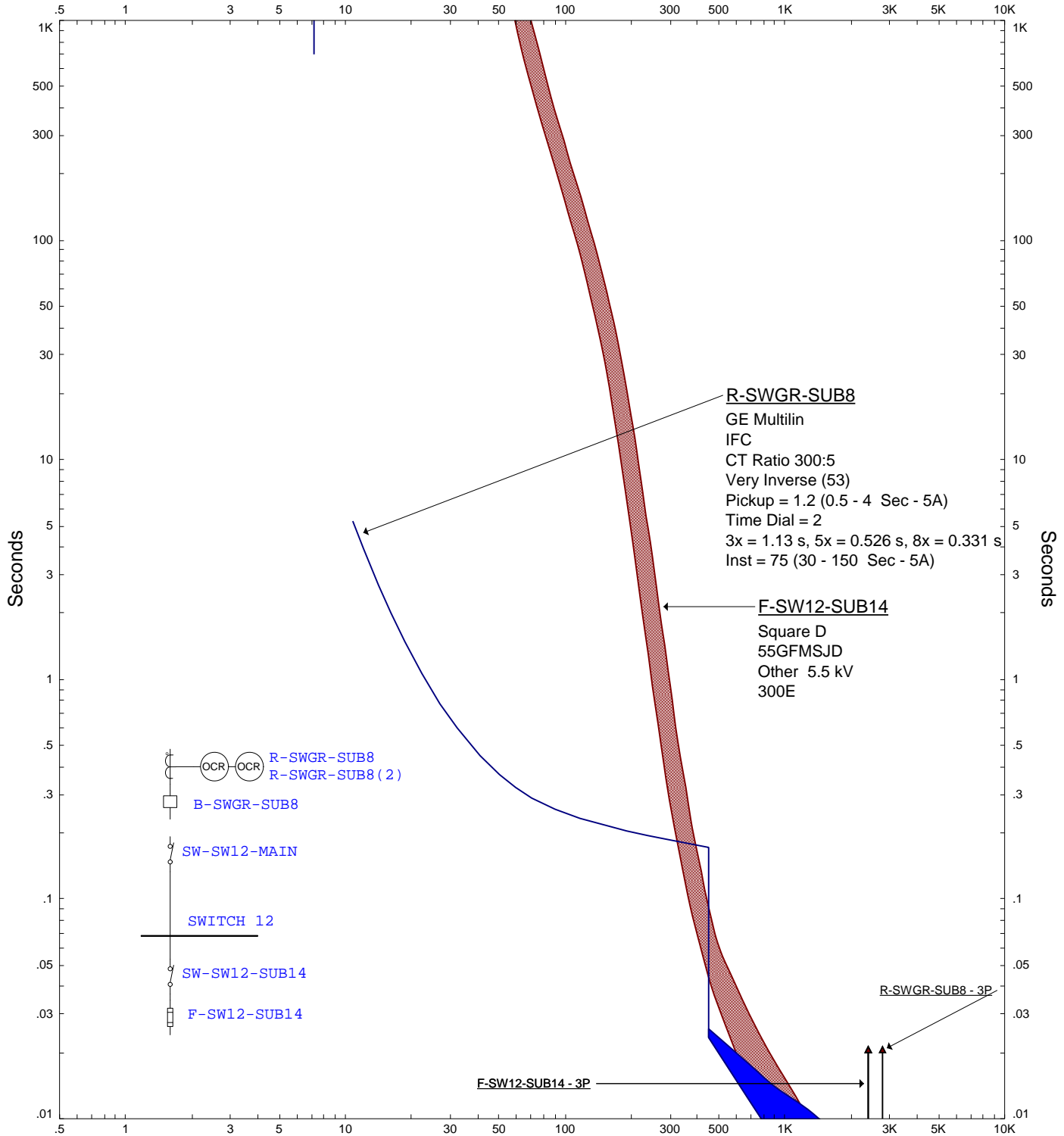
Amps DEEP WELL PUMP 4 VFD (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 39:SW11/SUB11/VFD</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: Swwrf Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014




Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)

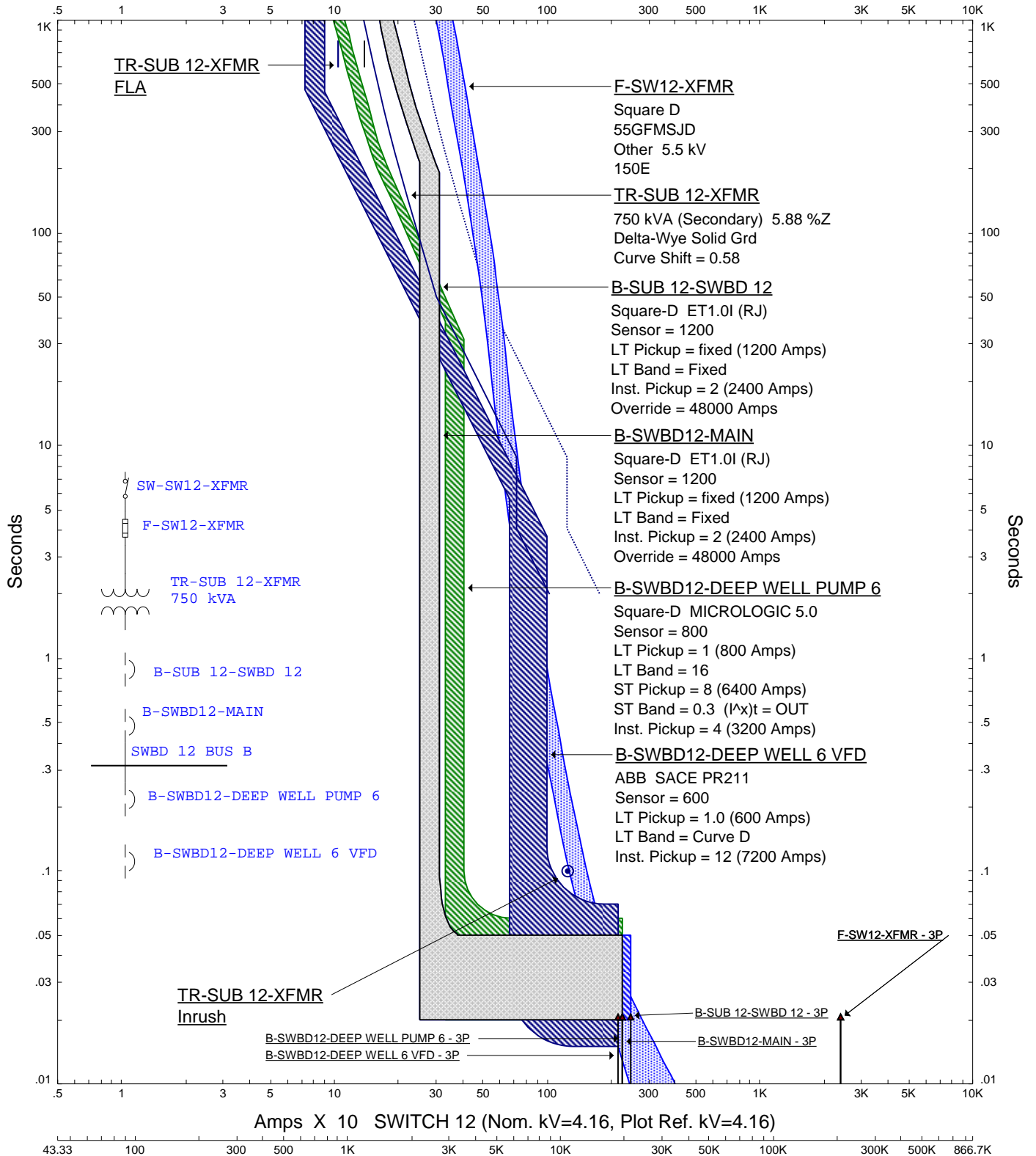


Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)


ETAP Star 12.6.0C

	<b>TCC 40:SWGR/SW12/SUB14</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

Amps X 10 SWITCH 12 (Nom. kV=4.16, Plot Ref. kV=4.16)

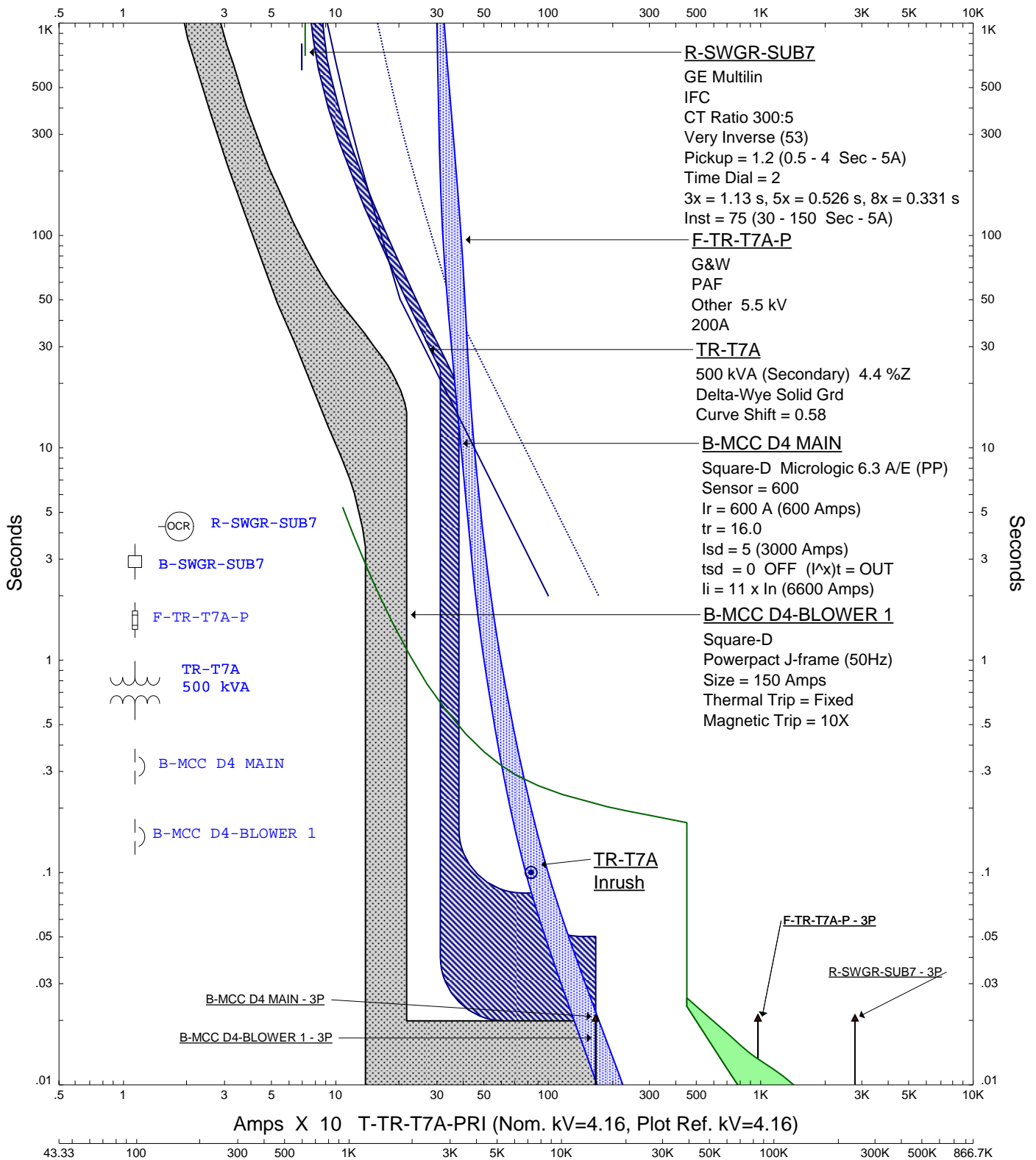


Amps SWBD 12 BUS B (Nom. kV=0.48, Plot Ref. kV=0.48)

	<b>TCC 41:SW12/SUB12/VFD</b>	ETAP Star 12.6.0C
		
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014
		<b>191</b>



Amps X 10 T-TR-T7A-PRI (Nom. kV=4.16, Plot Ref. kV=4.16)



ETAP Star 12.6.0C

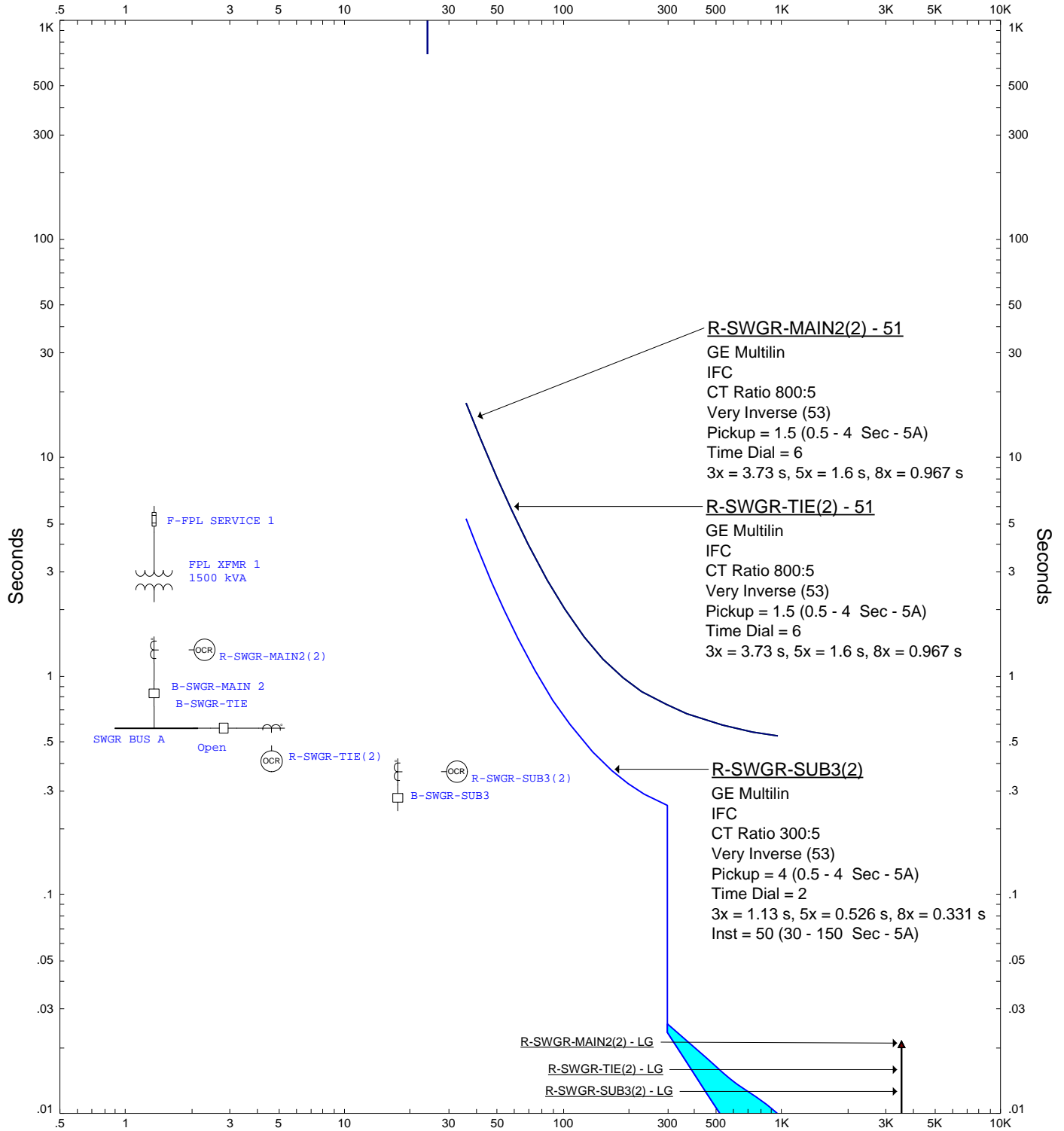
TCC 42:SWGR/MCCD4



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 11-06-2014

Amps X 10 SWGR MAIN 2 LS (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR MAIN 2 LS (Nom. kV=4.16, Plot Ref. kV=4.16)

ETAP Star 12.6.0C

TCC 43:MAIN2/TIE/SUB3 G

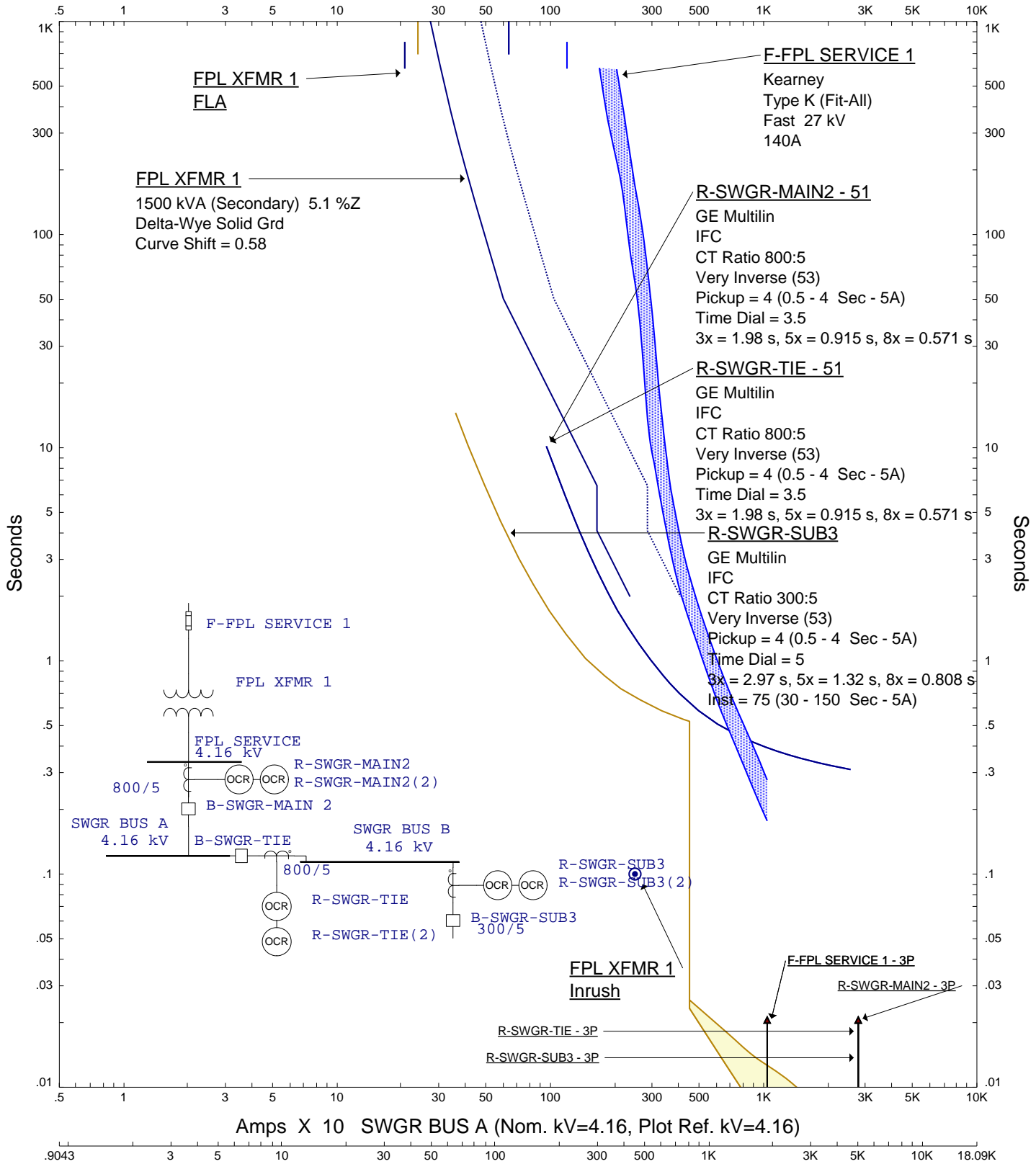


Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 11-06-2014  
 Rev: Base  
 Fault: Ground

**APPENDIX C2 – PROPOSED TIME CURRENT CURVES**

Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)

.9043 3 5 10 30 50 100 300 500 1K 3K 5K 10K 18.09K

Amps (Plot Ref. kV=23)

ETAP Star 12.6.0C

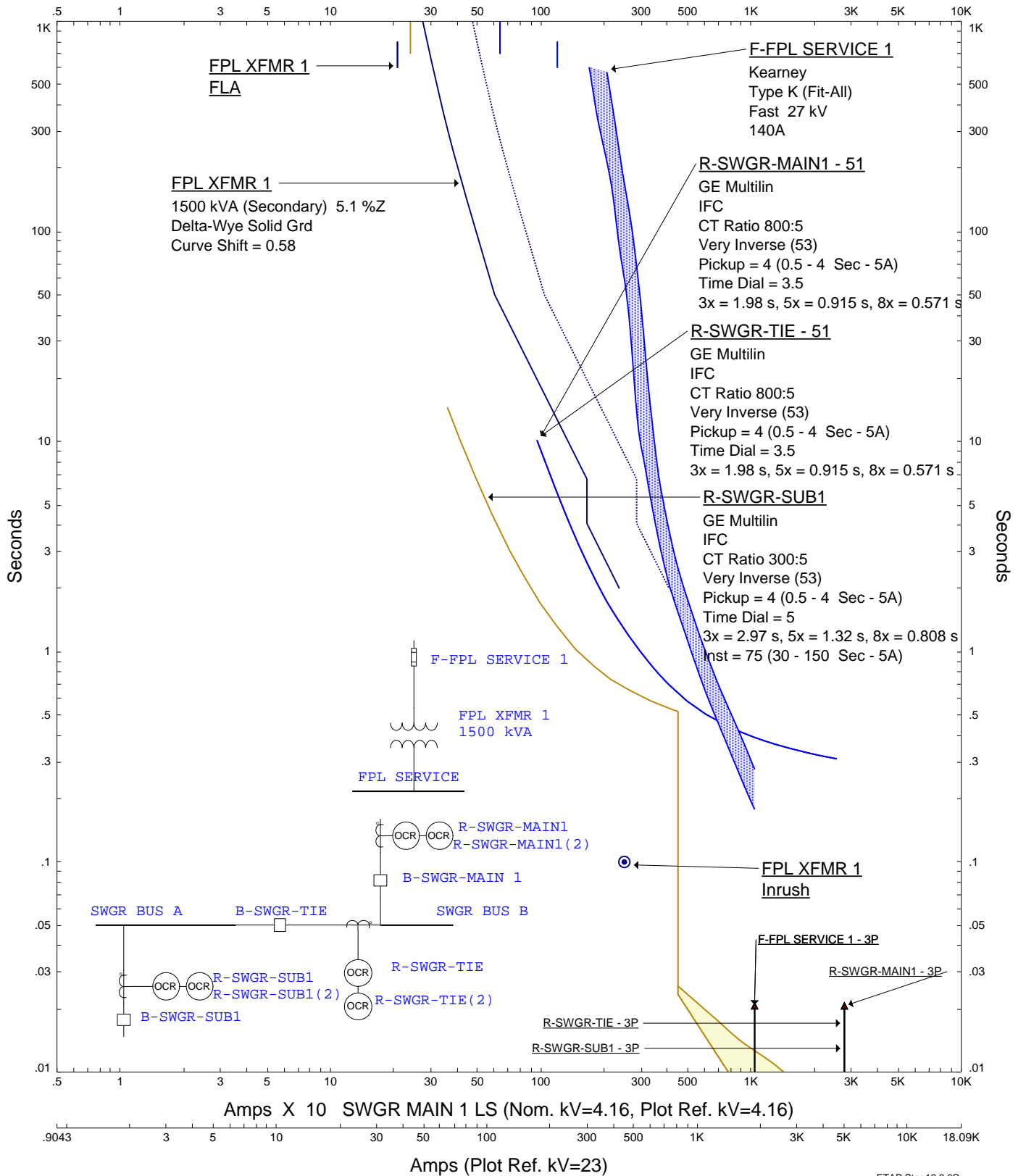
TCC 01:MAIN2/TIE/SUB3



Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW

Date: 04-28-2014

Amps X 10 SWGR MAIN 1 LS (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps (Plot Ref. kV=23)

ETAP Star 12.6.0C

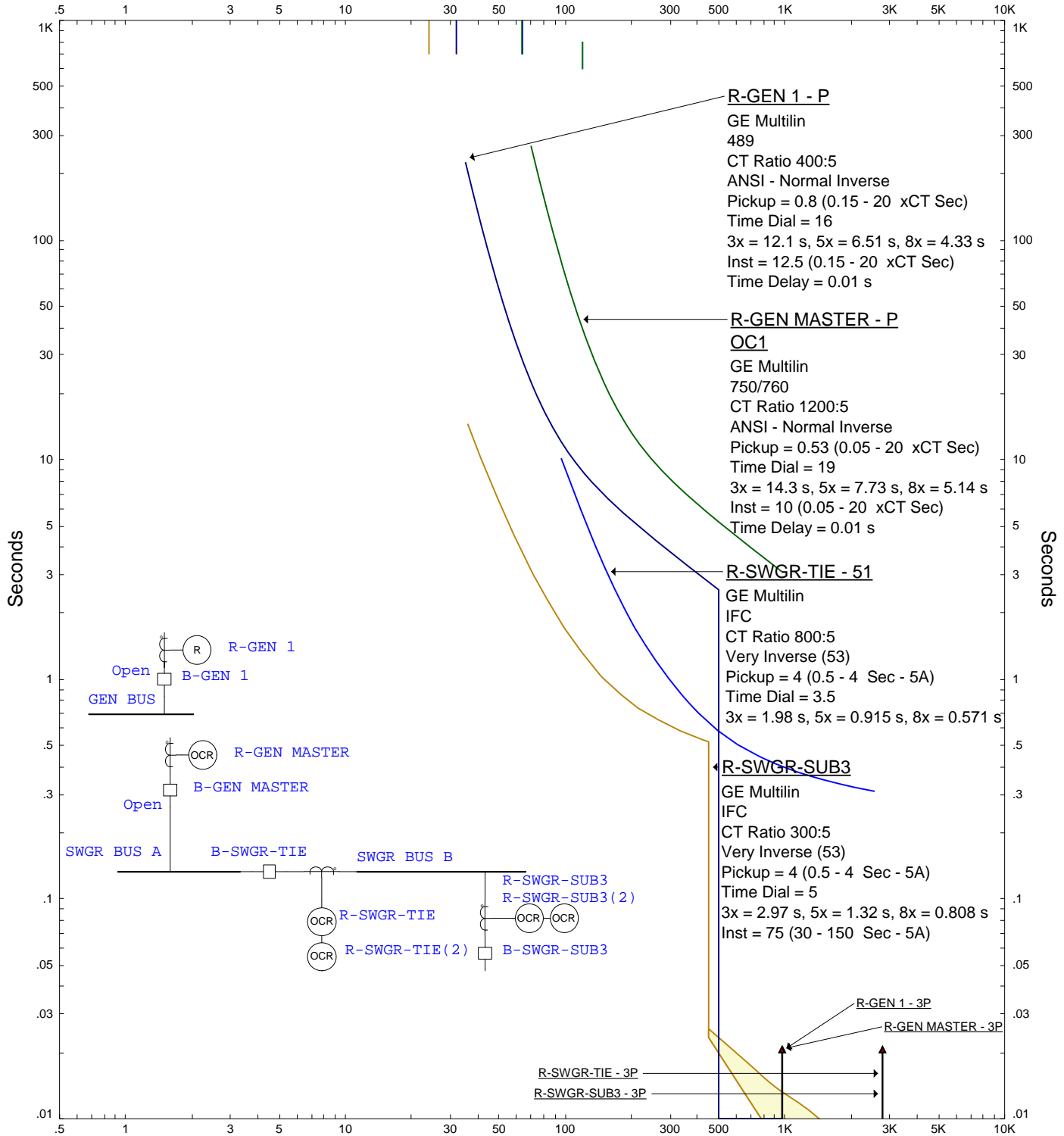
TCC 02:MAIN1/TIE/SUB1



Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW


Date: 04-28-2014

Amps X 10 GEN BUS (Nom. kV=4.16, Plot Ref. kV=4.16)

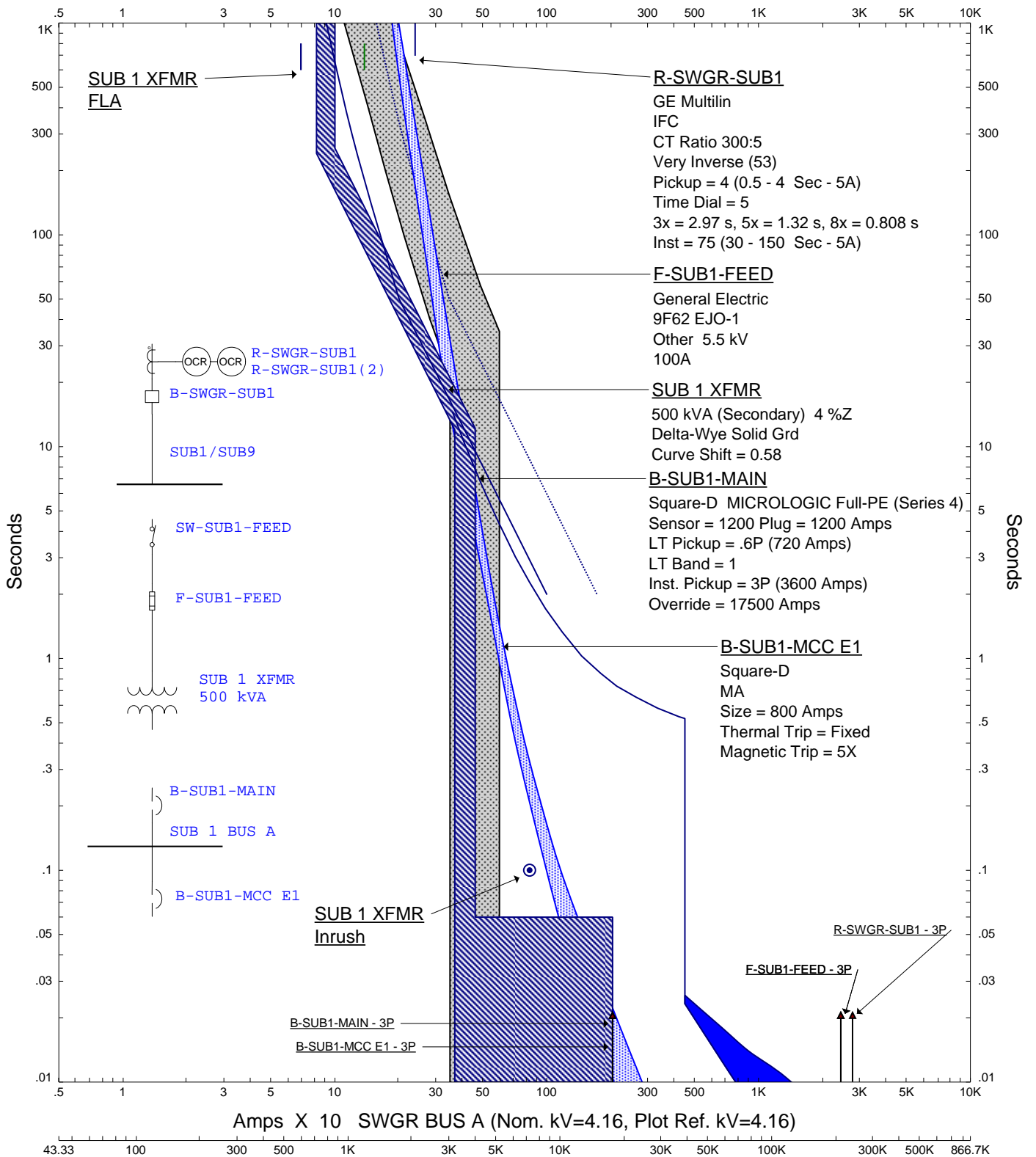



Amps X 10 GEN BUS (Nom. kV=4.16, Plot Ref. kV=4.16)

ETAP Star 12.6.0C

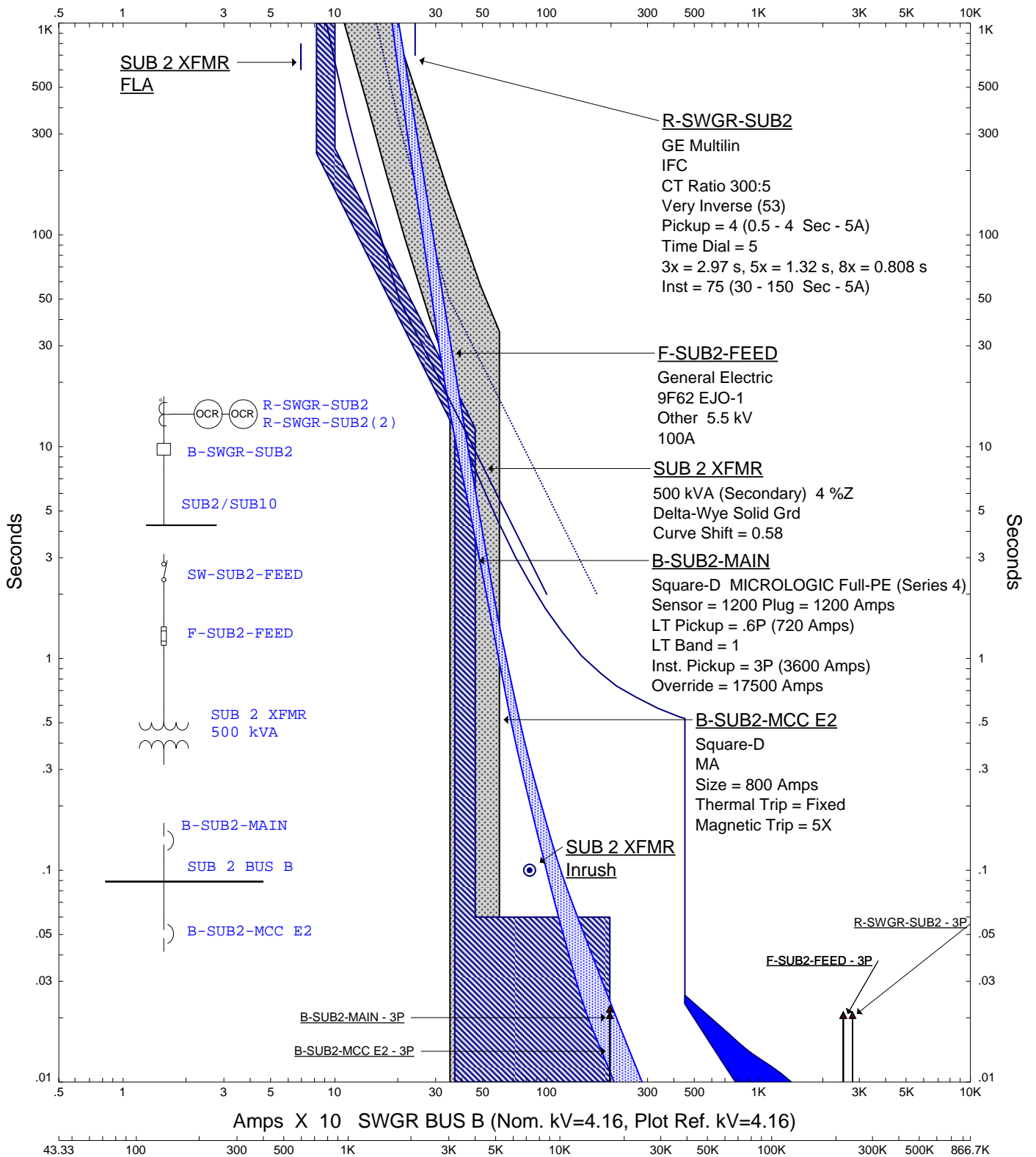
	<b>TCC 03:GEN1/TIE/SUB3</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW		Date: 04-28-2014

Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)



<b>TCC 04:SWGR/SUB1/MCCE1</b>		ETAP Star 12.6.0C
 Engineers...Working Wonders With Water™		
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW	Date: 04-28-2014	

Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)



TCC 05:SWGR/SUB2/MCCE2



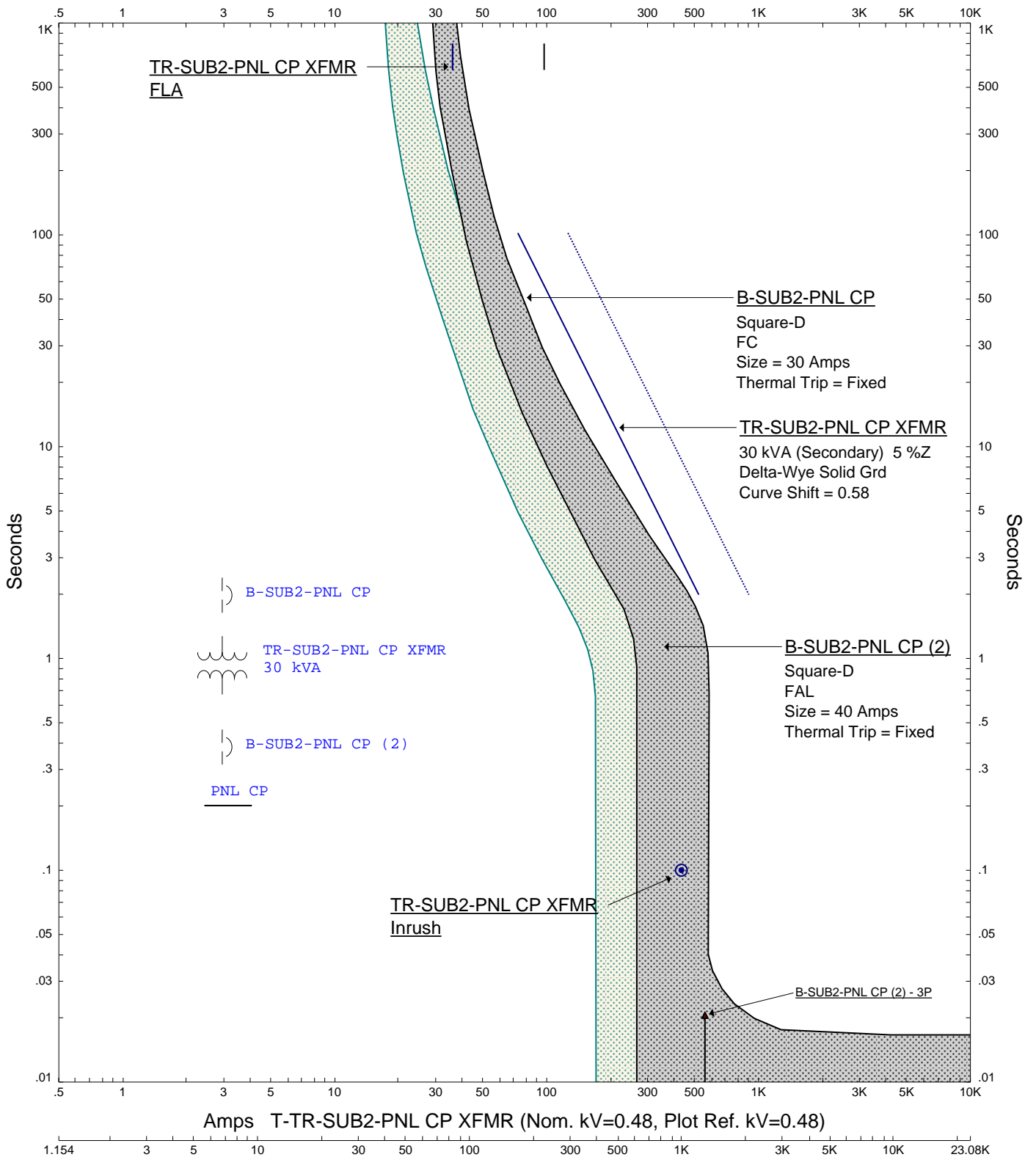
ETAP Star 12.6.0C

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014



Amps T-TR-SUB2-PNL CP XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps T-TR-SUB2-PNL CP XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)

Amps PNL CP (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

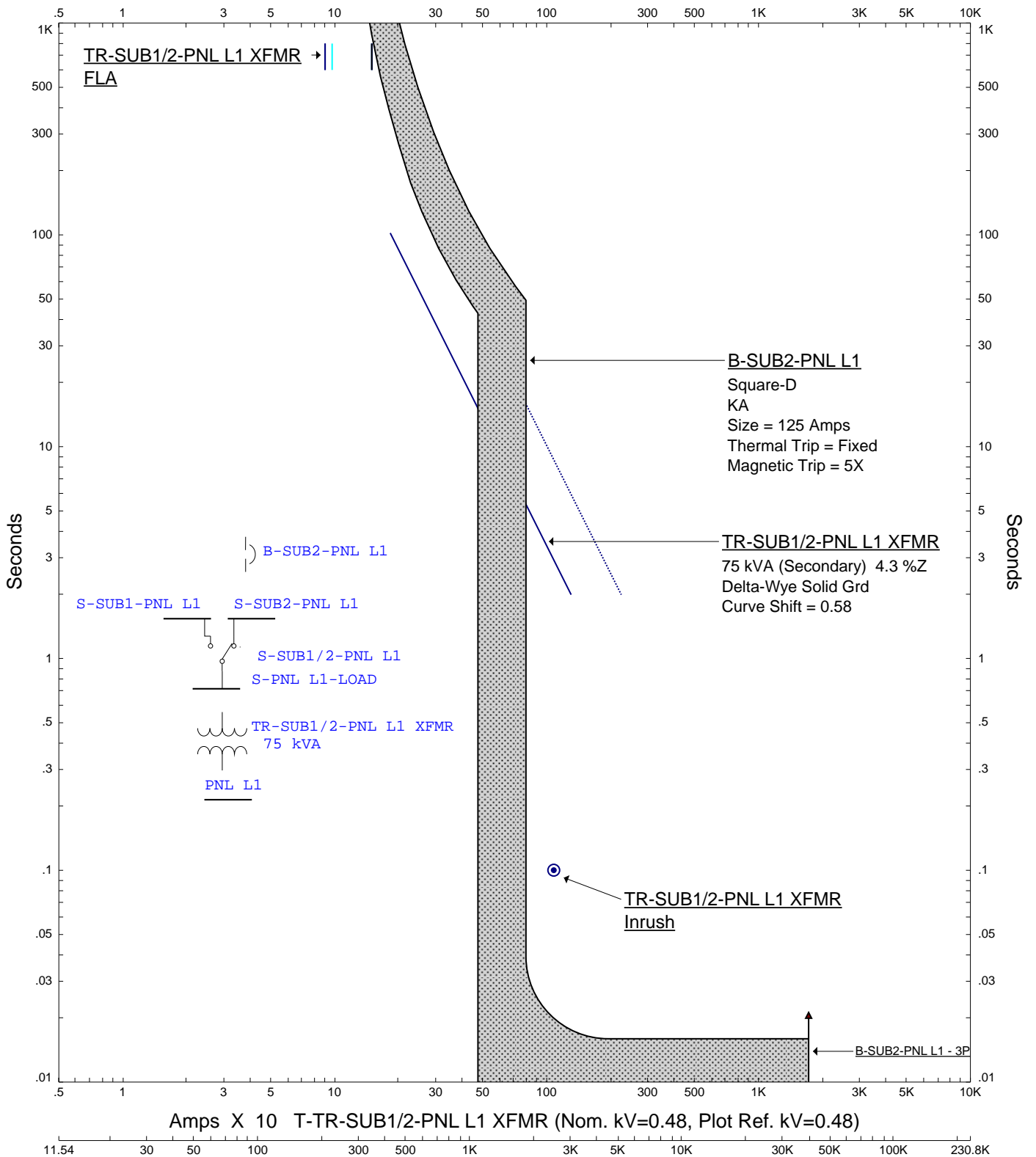
TCC 06: SUB2/PNL CP



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 T-TR-SUB1/2-PNL L1 XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 T-TR-SUB1/2-PNL L1 XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)

Amps PNL L1 (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

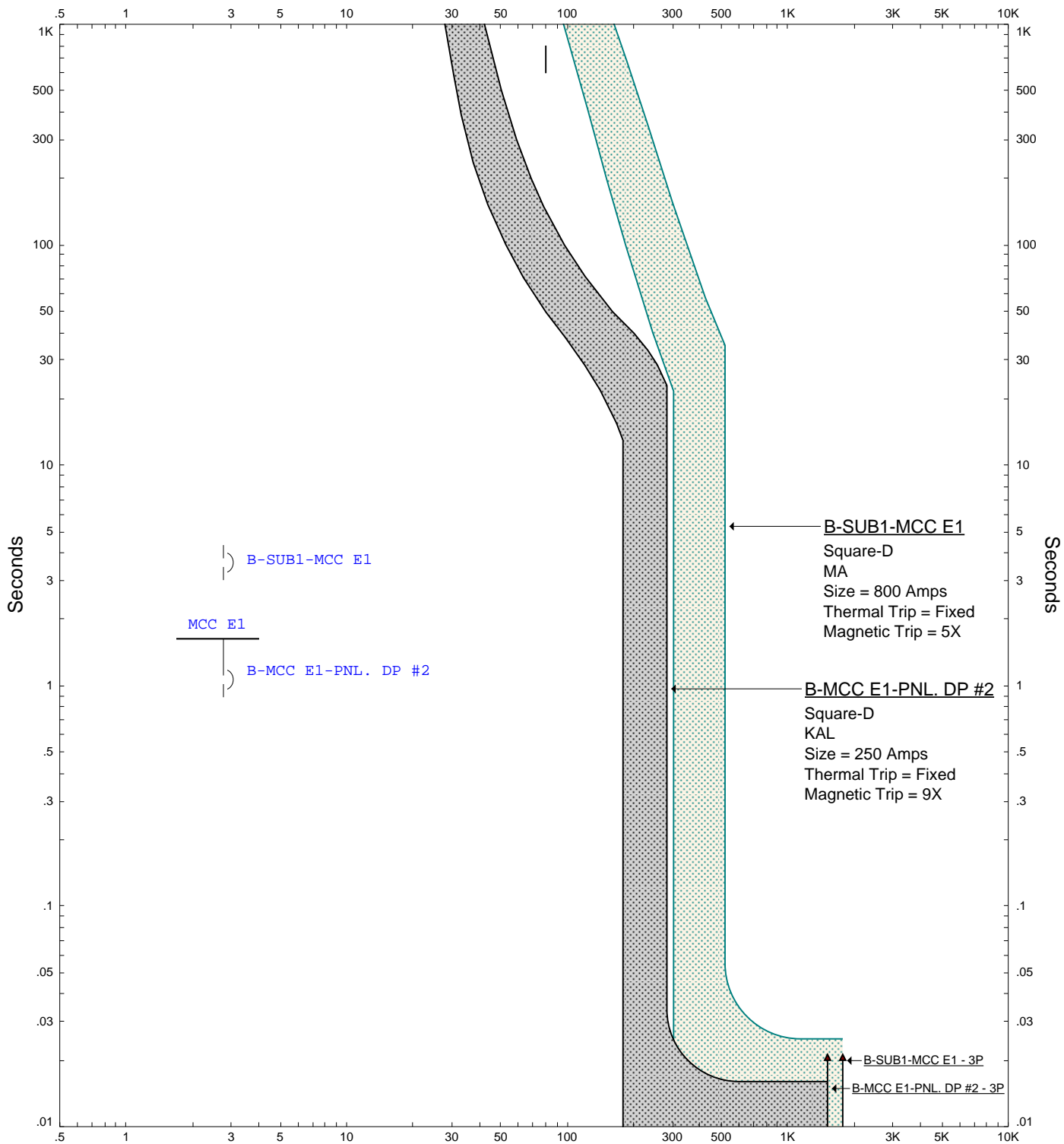
TCC 07:SUB2/PNL L1



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 SUB 1 BUS A (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 SUB 1 BUS A (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

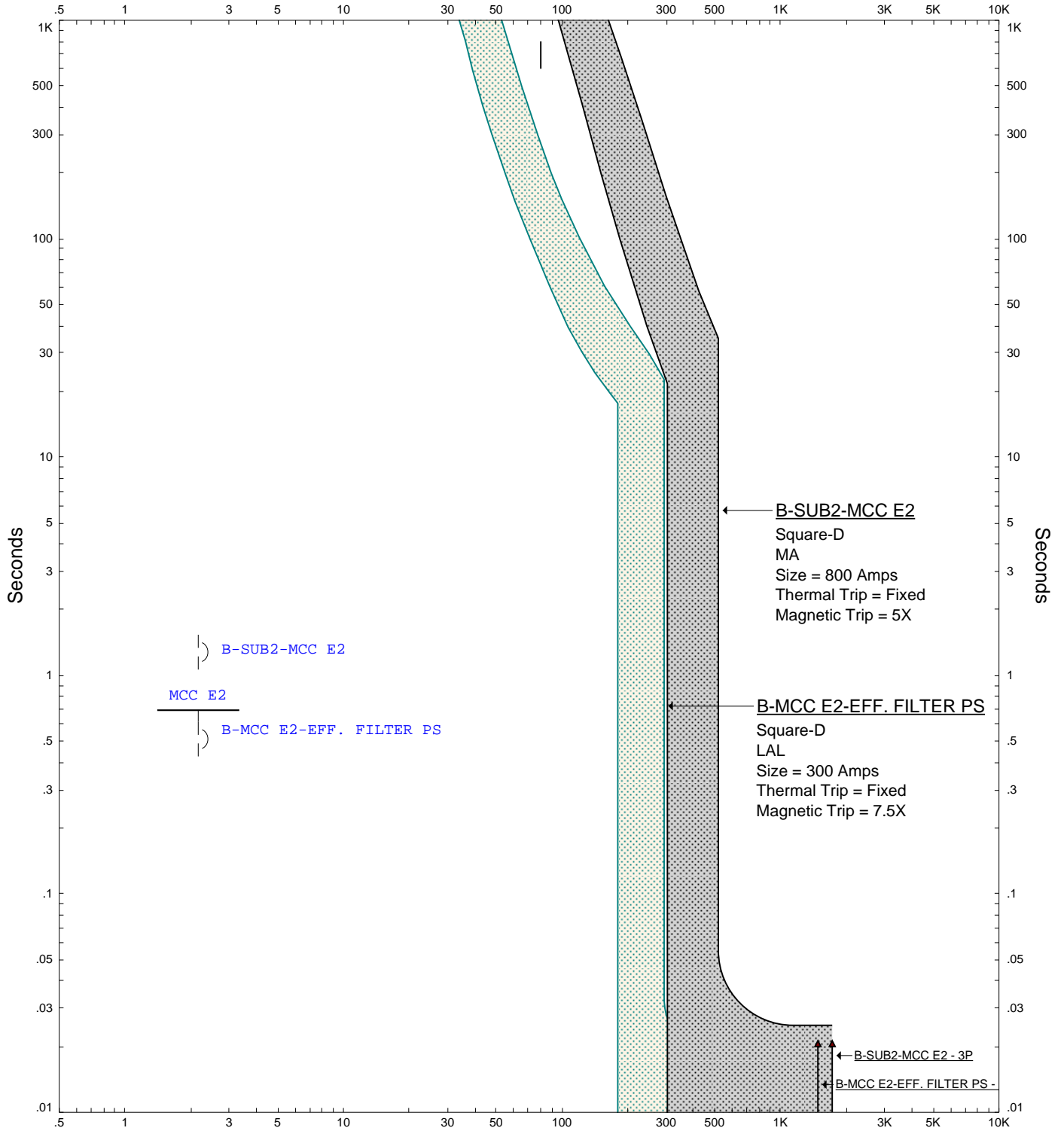
TCC 08:SUB1/MCCE1/PNL DP2



Project: MANATEE COUNTY ESS  
 Location: Swwrf  
 Contract: 8910V.00  
 Engineer: KTW


Date: 04-28-2014

Amps X 10 MCC E2 (Nom. kV=0.48, Plot Ref. kV=0.48)

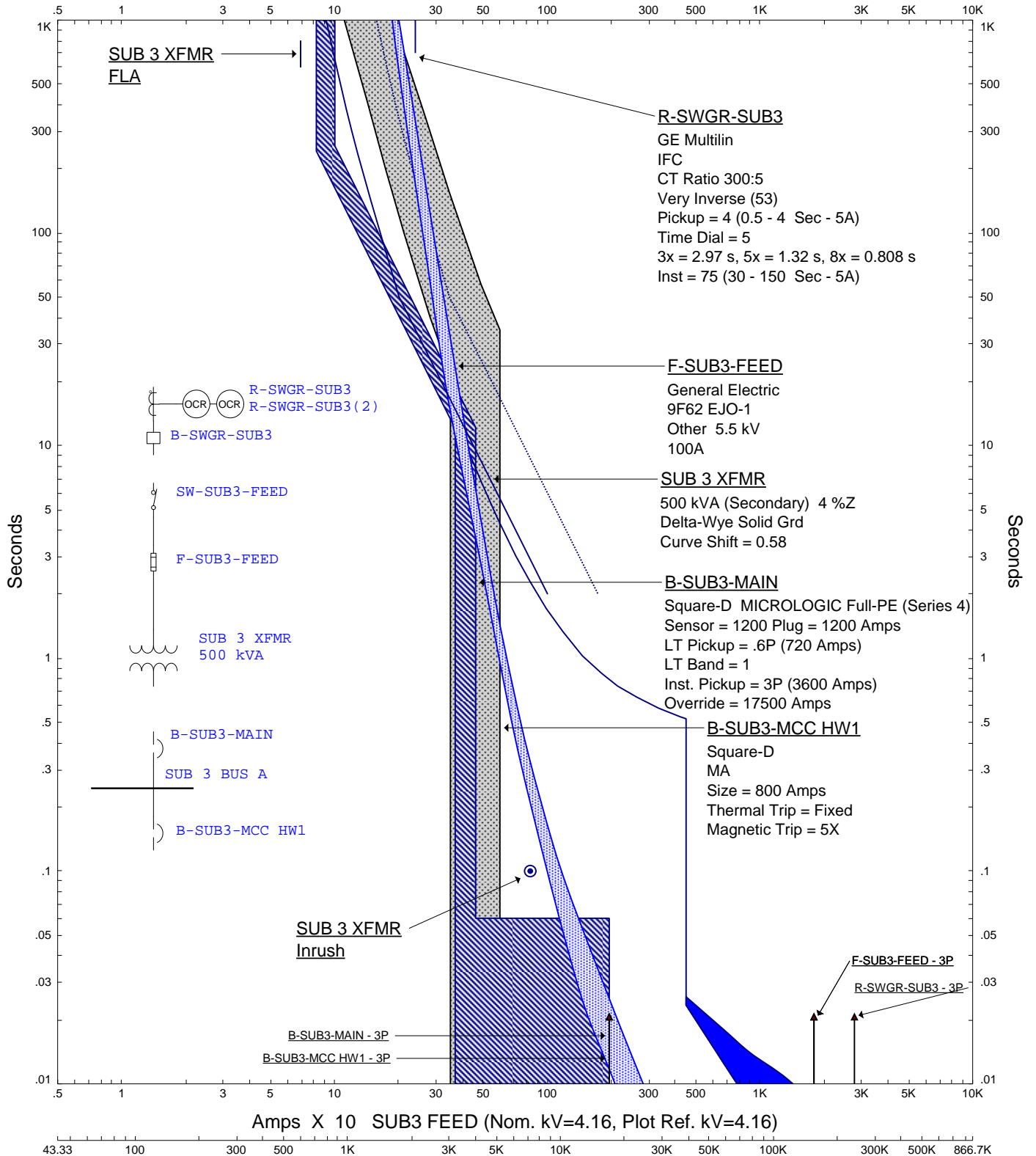


Amps X 10 MCC E2 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 09:SUB2/MCCE2/EFF FIL</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SwwRF Contract: 8910V.00 Engineer: KTW		Date: 04-28-2014

Amps X 10 SUB3 FEED (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps MCC HW 1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

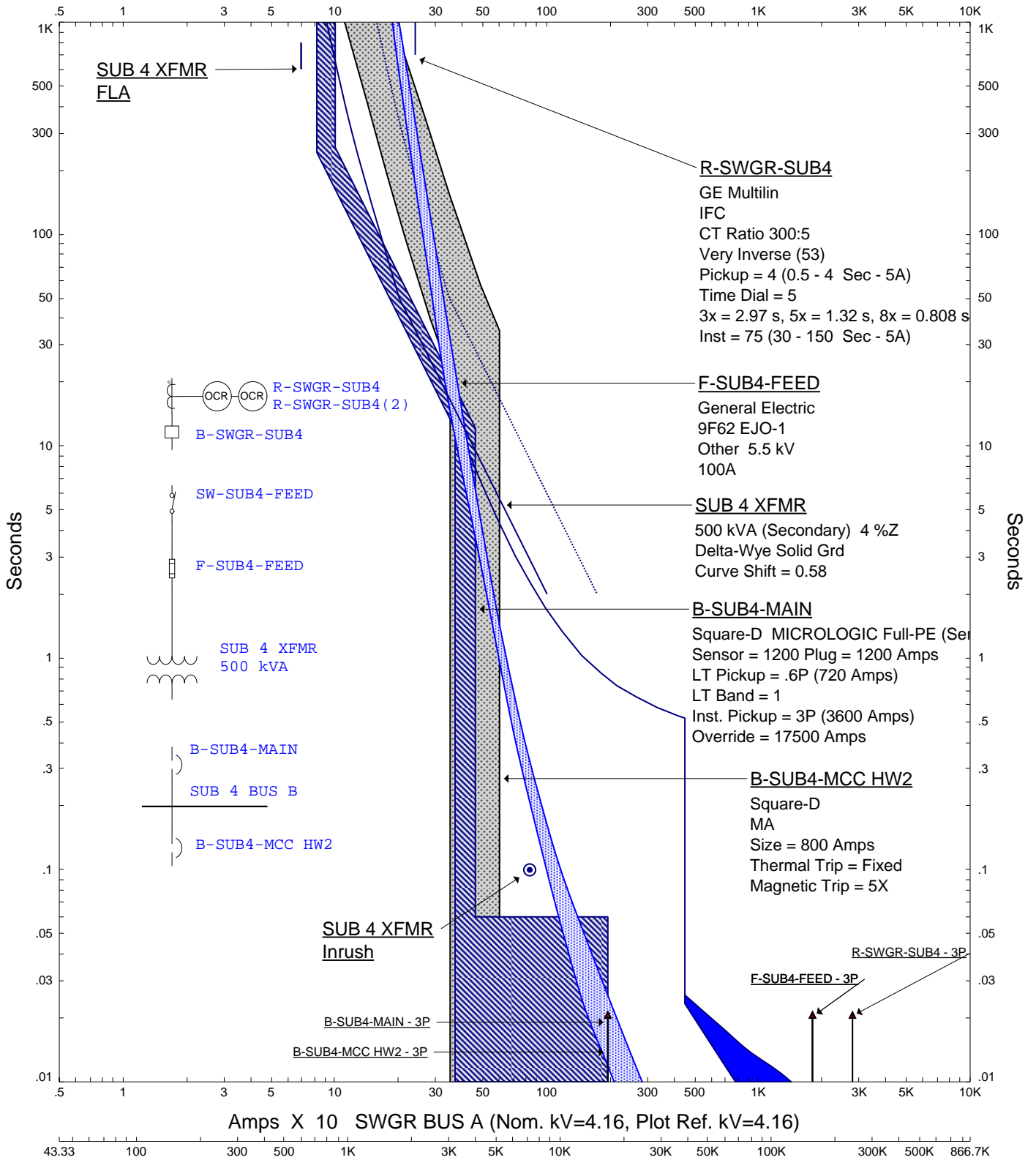
TCC 10:SWGR/SUB3/MCCHW1



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)



TCC 11:SWGR/SUB4/MCCHW2



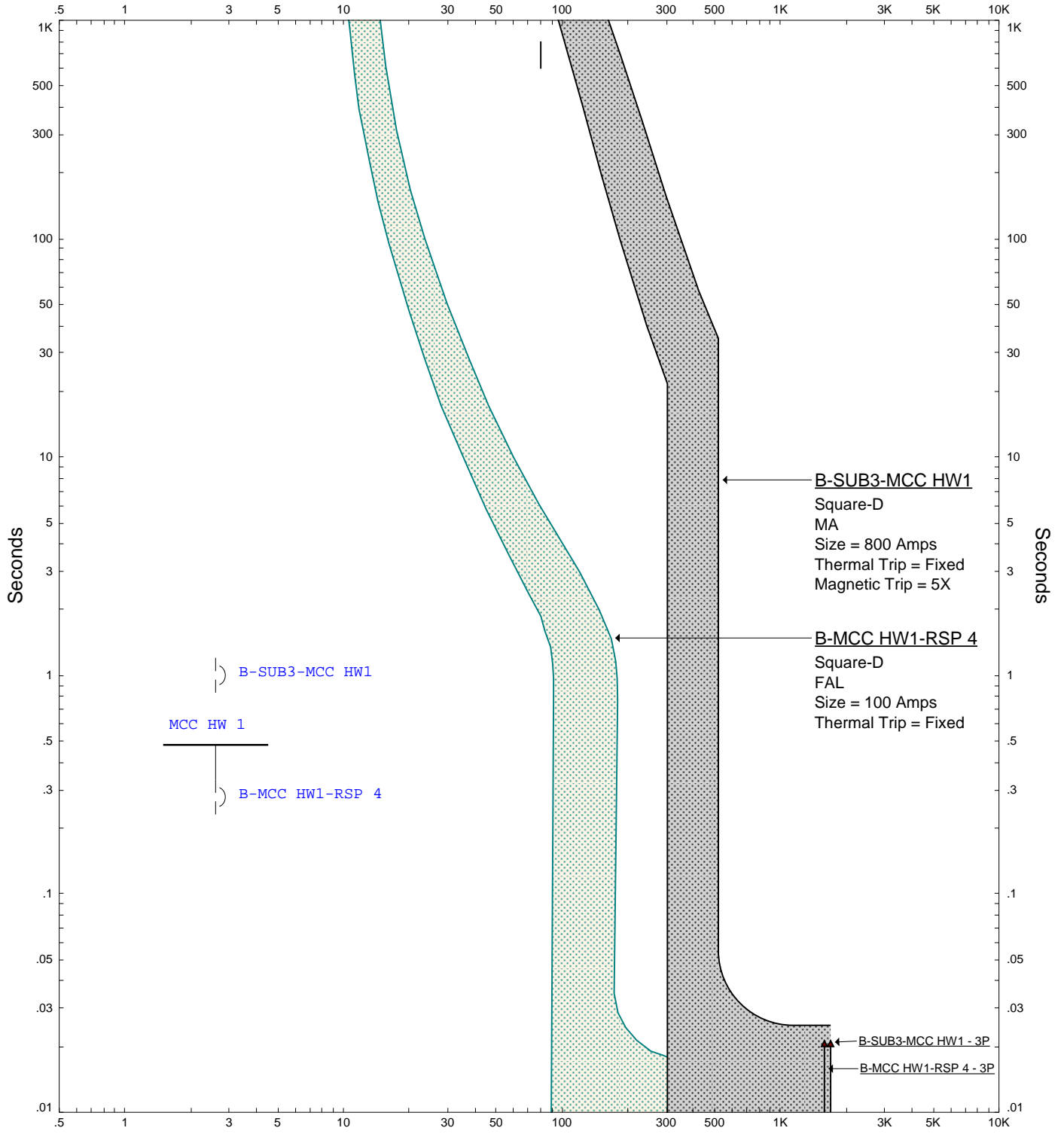
ETAP Star 12.6.0C

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014



Amps X 10 MCC HW 1 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 MCC HW 1 (Nom. kV=0.48, Plot Ref. kV=0.48)

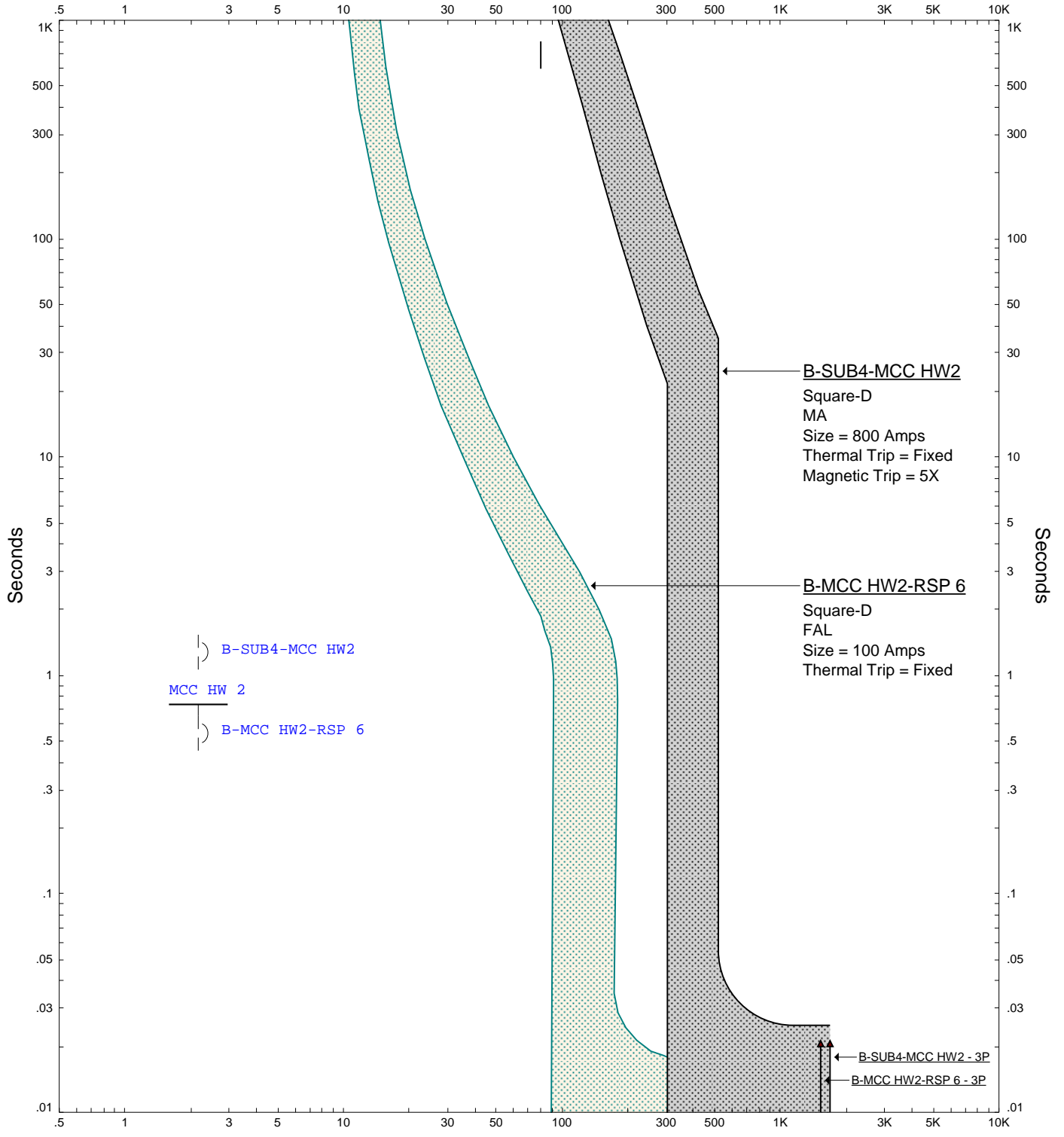
ETAP Star 12.6.0C

TCC 12:SUB3/MCCHW1/RSP4




<p>Project: MANATEE COUNTY ESS                  Location: SWWRF                  Contract: 8910V.00                  Engineer: KTW</p>		<p>Date: 04-28-2014</p>
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Amps X 10 MCC HW 2 (Nom. kV=0.48, Plot Ref. kV=0.48)



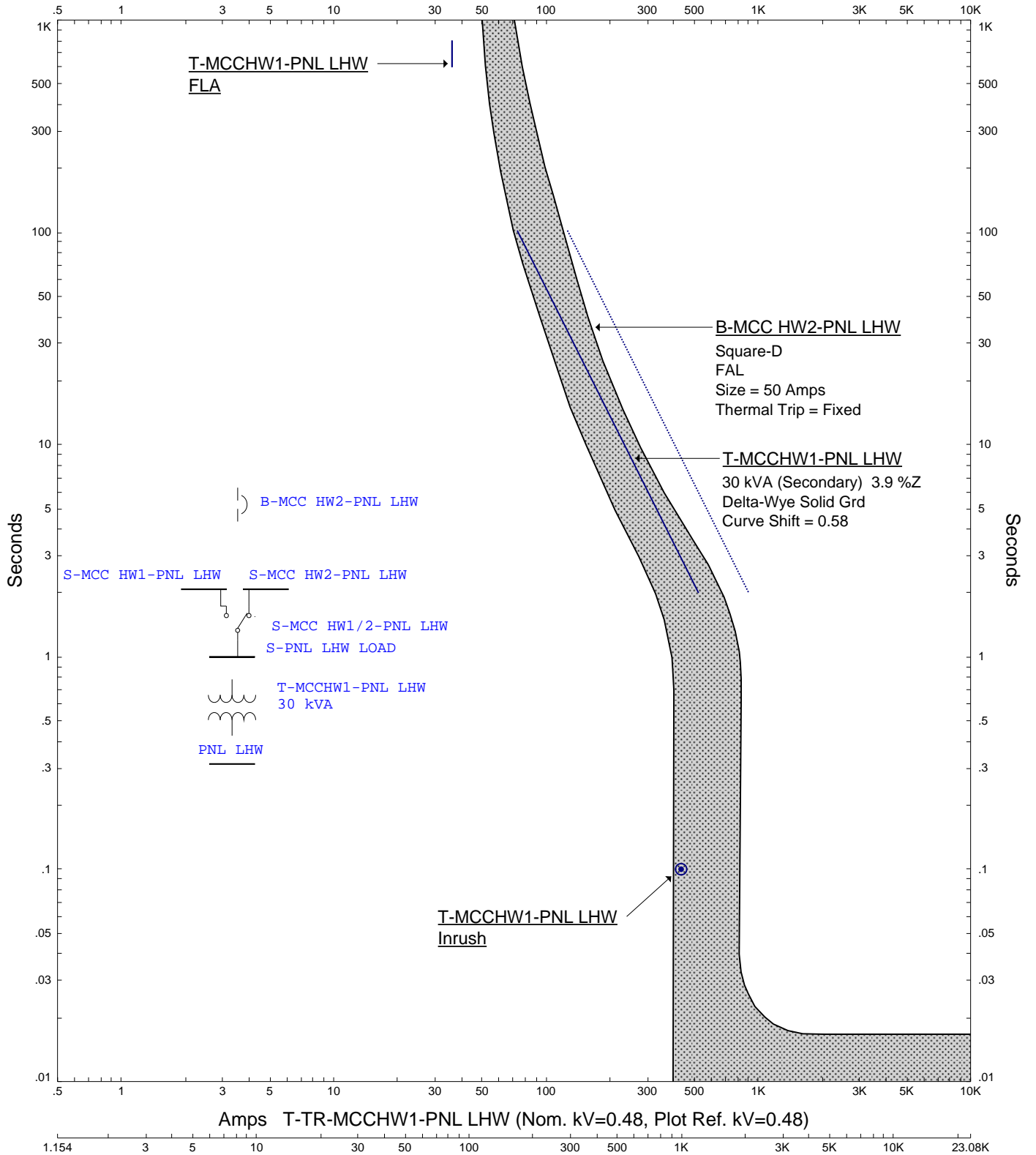
Amps X 10 MCC HW 2 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 13:SUB4/MCCHW2/RSP6</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SwwRF Contract: 8910V.00 Engineer: KTW		Date: 04-28-2014



Amps T-TR-MCCHW1-PNL LHW (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps T-TR-MCCHW1-PNL LHW (Nom. kV=0.48, Plot Ref. kV=0.48)

Amps PNL LHW (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

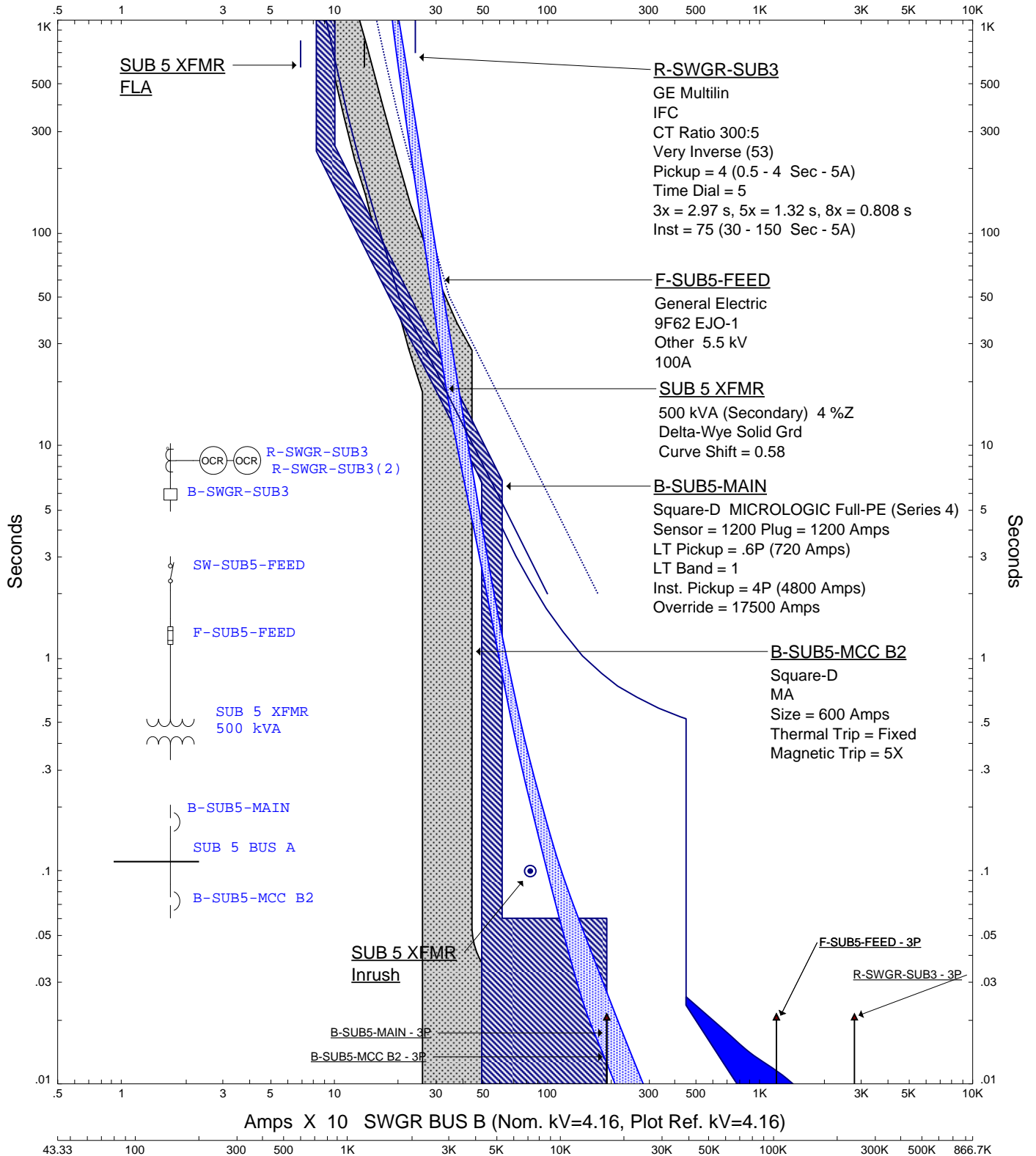
TCC 14:MCCHW2/PNL LHW



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)

43.33 100 300 500 1K 3K 5K 10K 30K 50K 100K 300K 500K 866.7K

Amps SUB 5 BUS A (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

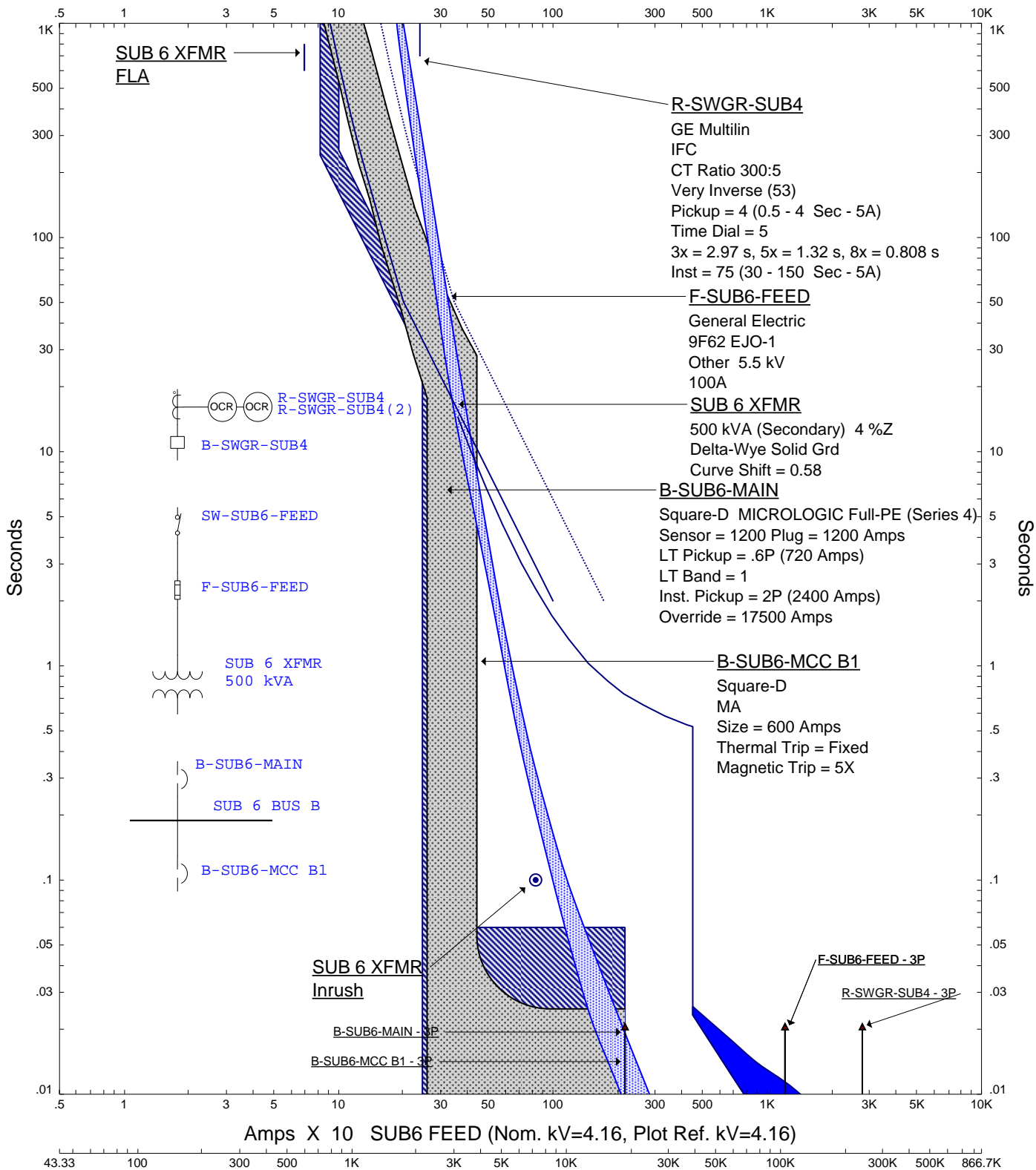
TCC 15:SWGR/SUB5/MCCB2



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 SUB6 FEED (Nom. kV=4.16, Plot Ref. kV=4.16)



ETAP Star 12.6.0C

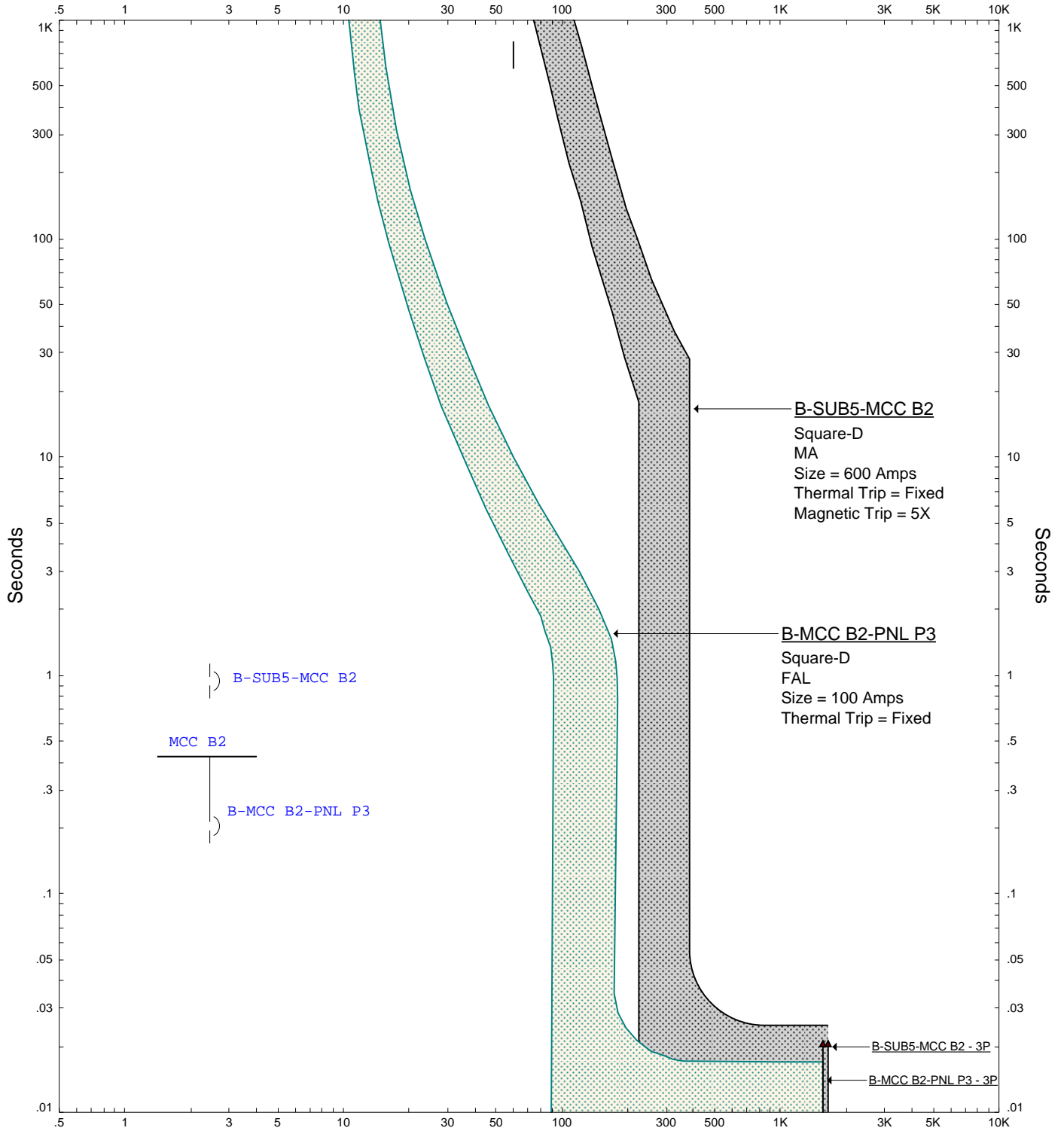
TCC 16:SWGR/SUB6/MCCB1



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-28-2014

Amps X 10 MCC B2 (Nom. kV=0.48, Plot Ref. kV=0.48)



**B-SUB5-MCC B2**  
 Square-D  
 MA  
 Size = 600 Amps  
 Thermal Trip = Fixed  
 Magnetic Trip = 5X


**B-MCC B2-PNL P3**  
 Square-D  
 FAL  
 Size = 100 Amps  
 Thermal Trip = Fixed

**B-SUB5-MCC B2**  
**MCC B2**  
**B-MCC B2-PNL P3**

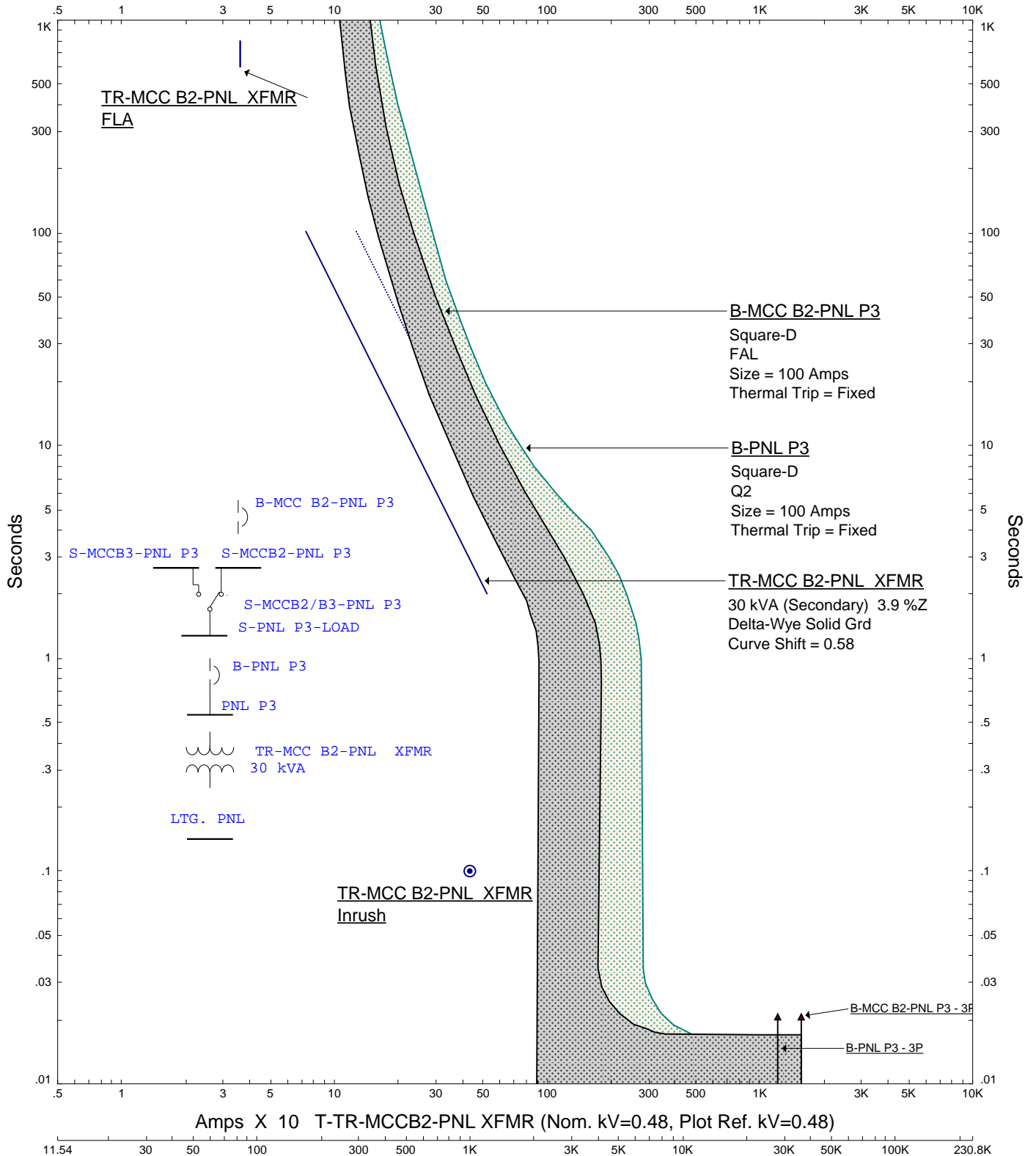
**B-SUB5-MCC B2 - 3P**  
**B-MCC B2-PNL P3 - 3P**

Amps X 10 MCC B2 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 17:SUB5/MCCB2/PNL P3</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SwwRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

Amps X 10 T-TR-MCCB2-PNL XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 T-TR-MCCB2-PNL XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)

Amps LTG. PNL (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

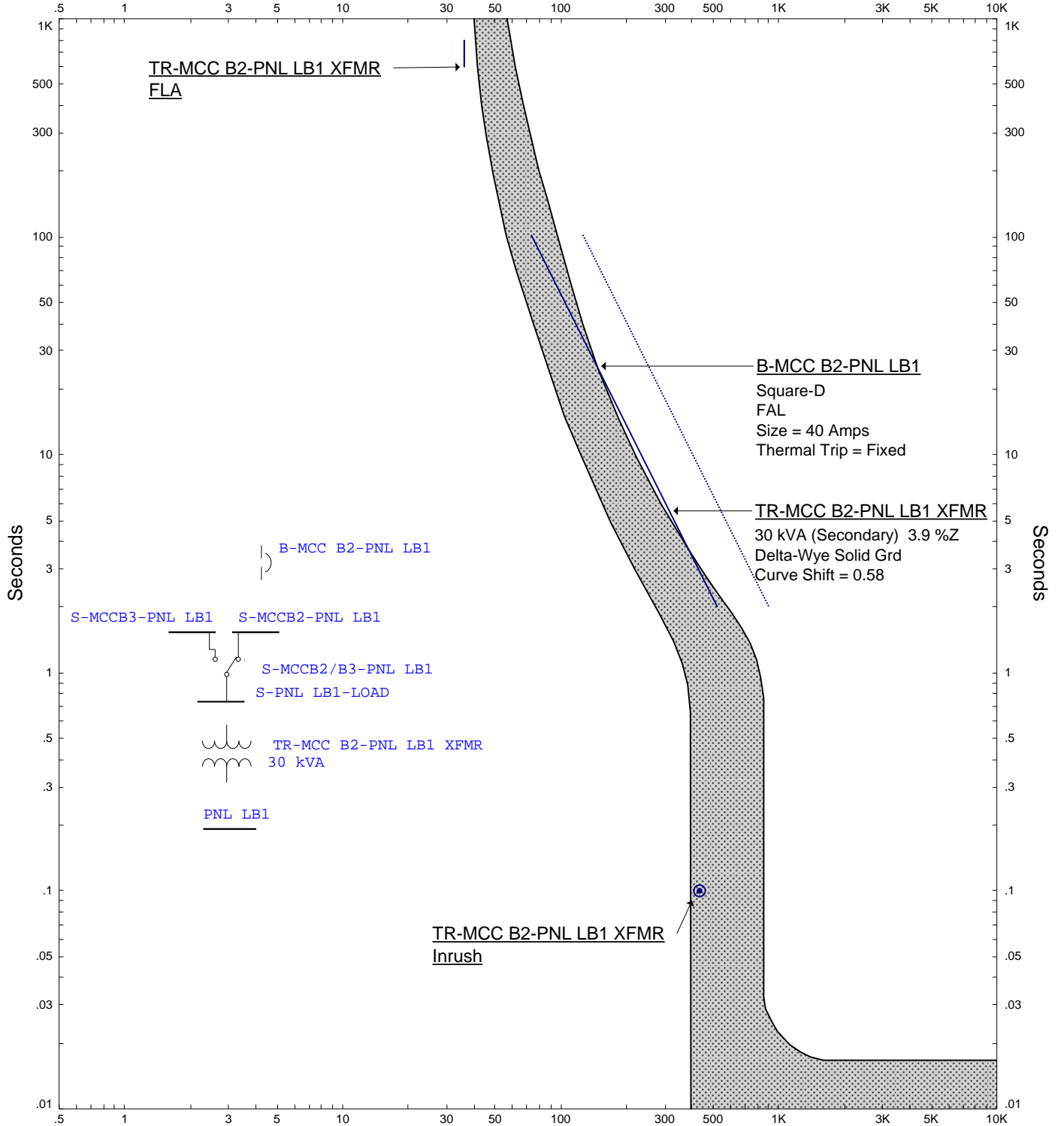
TCC 18:MCCB2/PNL P3



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014

Amps T-TR-MCCB2-PNL LB1 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps T-TR-MCCB2-PNL LB1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

TCC 19:MCCB2/PNL LB1

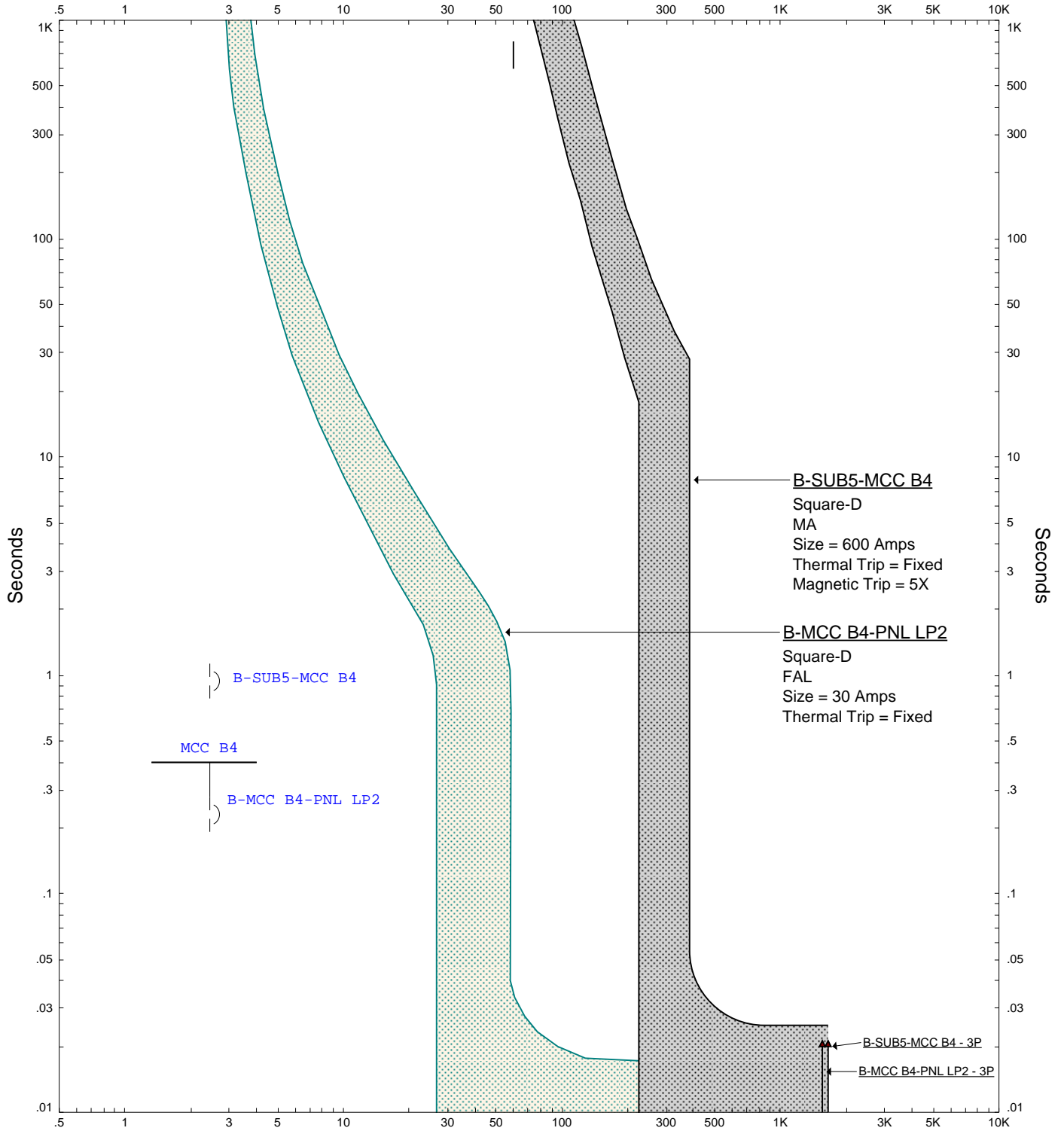


Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014



Amps X 10 MCC B4 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 MCC B4 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

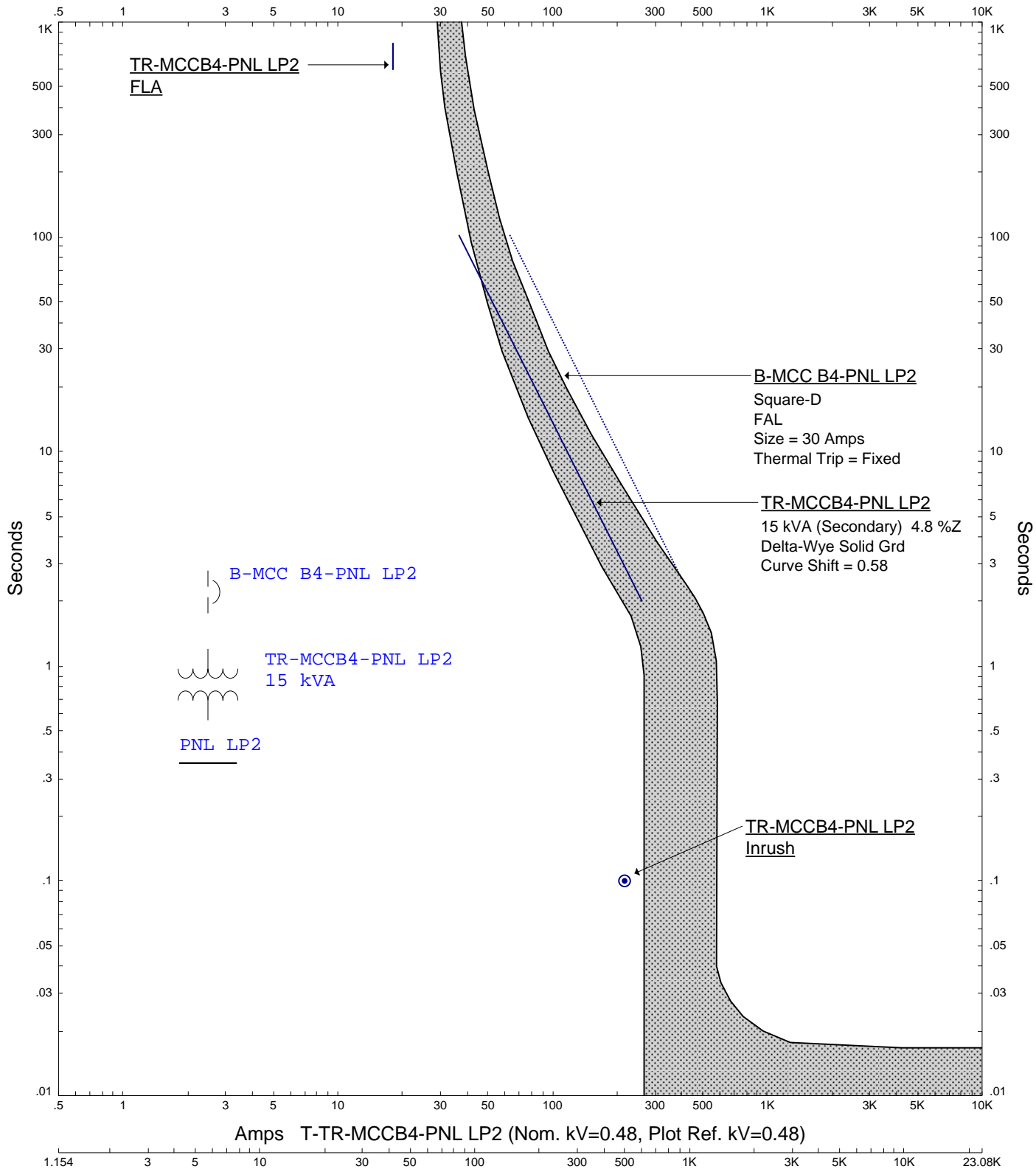
TCC 20:SUB5/MCCB4/PNL LP2



Project: MANATEE COUNTY ESS  
 Location: SwwRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014

Amps T-TR-MCCB4-PNL LP2 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps T-TR-MCCB4-PNL LP2 (Nom. kV=0.48, Plot Ref. kV=0.48)

Amps PNL LP2 (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

TCC 21:MCCB4/PNL LP2

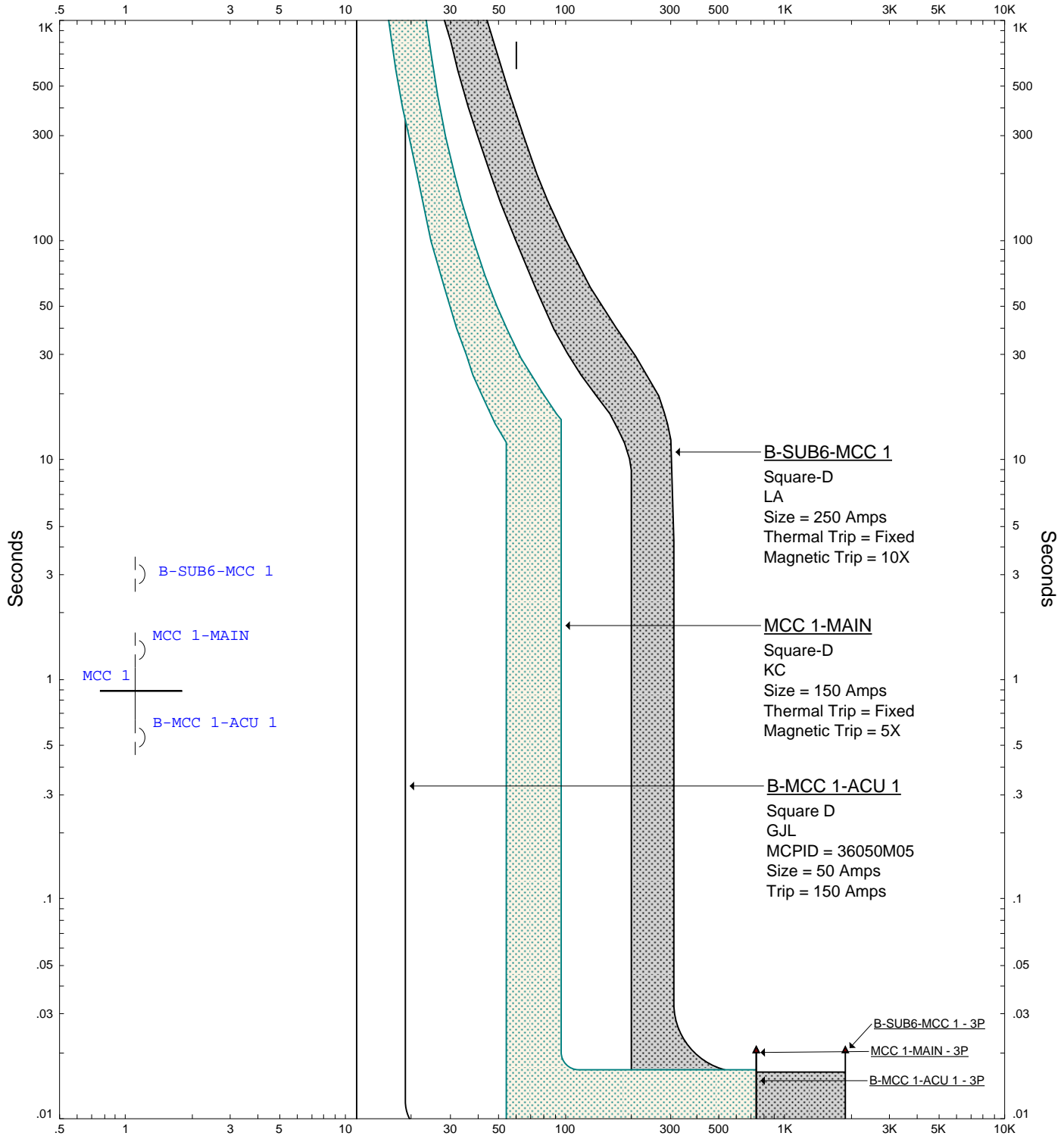


Project: MANATEE COUNTY ESS  
 Location: SwwRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014



Amps X 10 MCC 1 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 MCC 1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

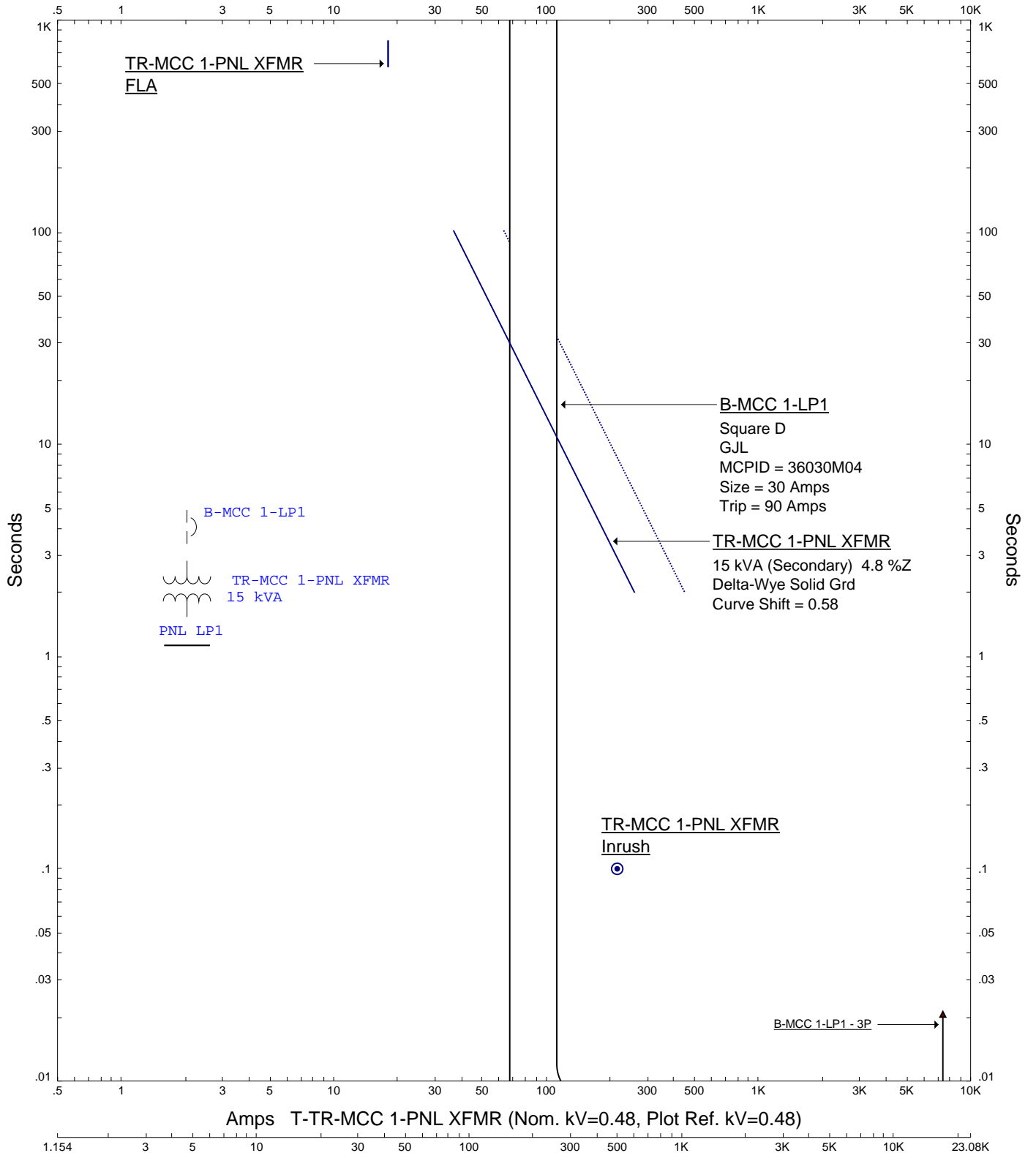
TCC 22:SUB6/MCC1/ACU



Project: MANATEE COUNTY ESS  
 Location: SwwRF  
 Contract: 8910V.00  
 Engineer: KTW


Date: 04-29-2014

Amps T-TR-MCC 1-PNL XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)

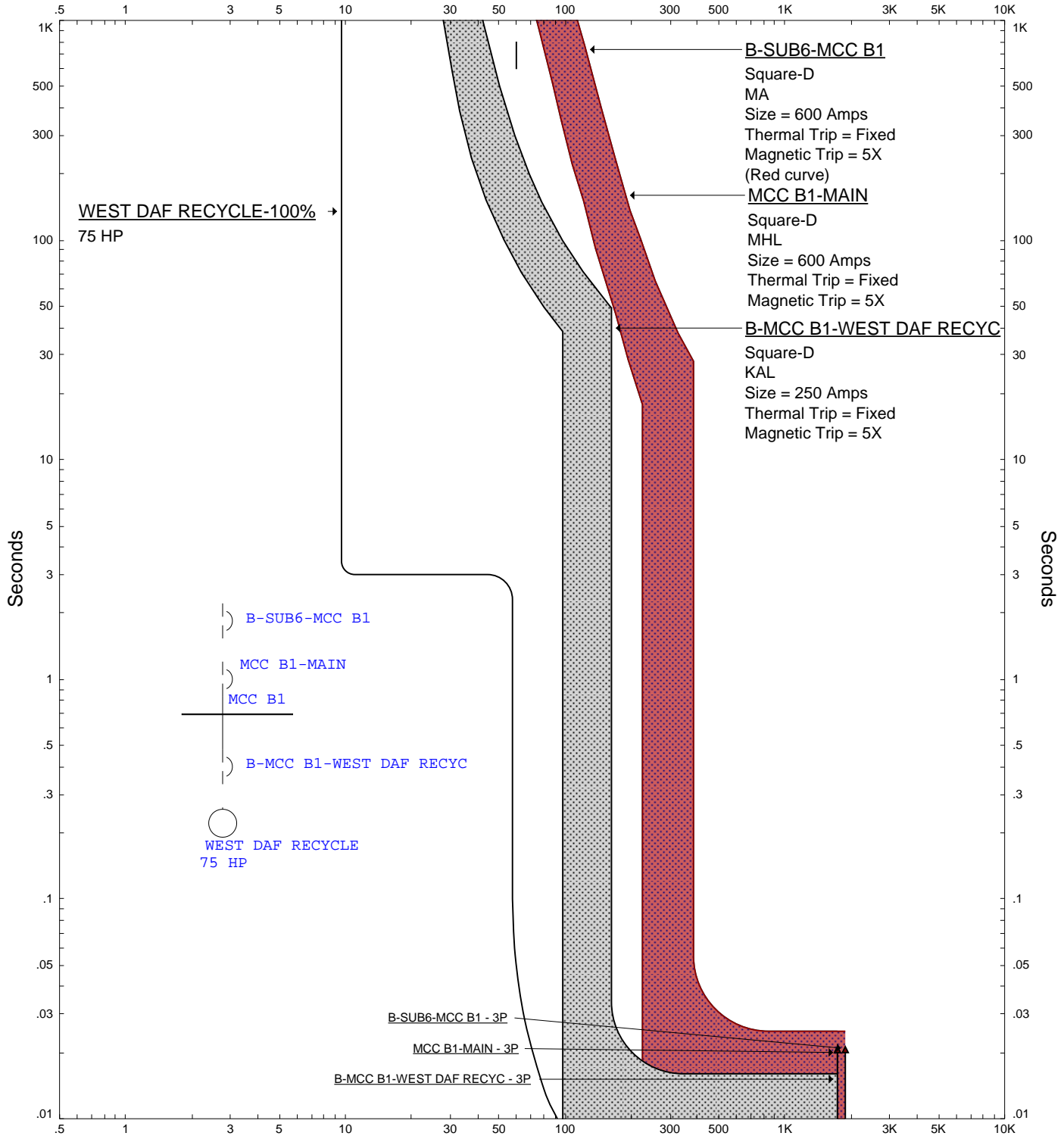


Amps PNL LP1 (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C


	<p><b>TCC 23:MCC1/PNL LP1</b></p>	
<p>Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW</p>		<p>Date: 04-29-2014</p> <p style="text-align: right;">217</p>

Amps X 10 MCC B1 (Nom. kV=0.48, Plot Ref. kV=0.48)

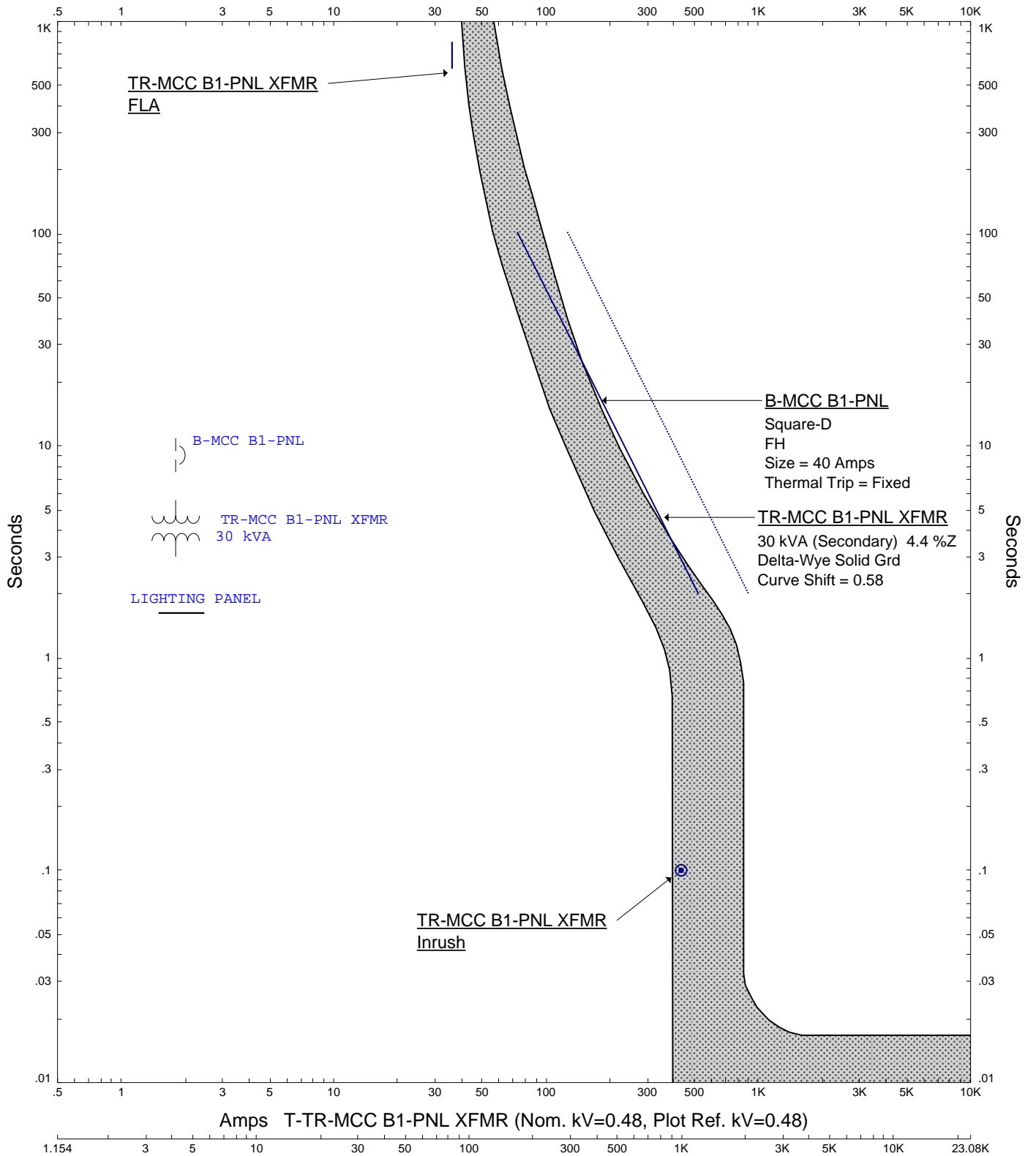


Amps X 10 MCC B1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 24:SUB6/MCCB1/W DAF</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SwwRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014


Amps T-TR-MCC B1-PNL XFMR (Nom. kV=0.48, Plot Ref. kV=0.48)



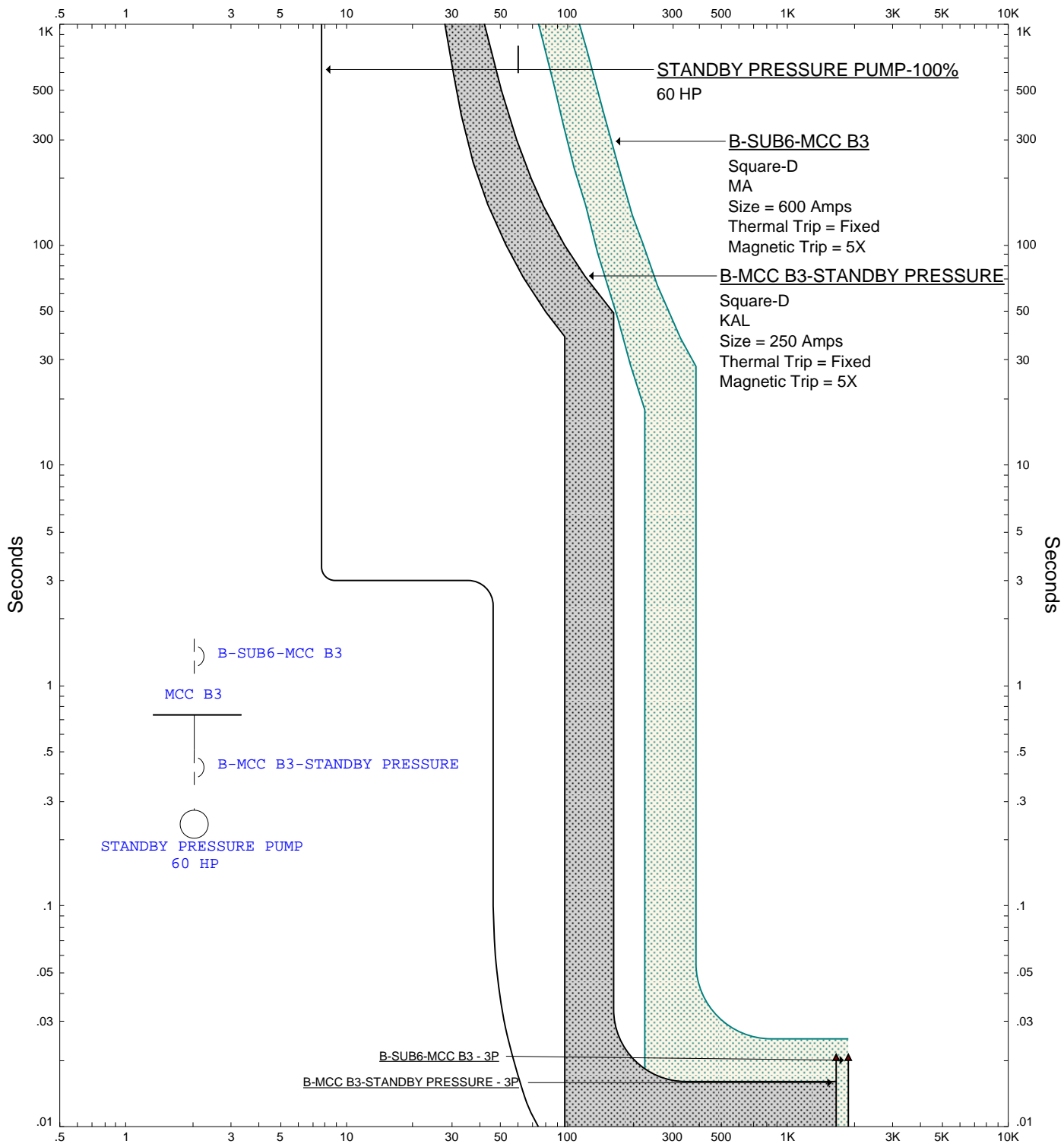
Amps LIGHTING PANEL (Nom. kV=0.208, Plot Ref. kV=0.208)

1.154 3 5 10 30 50 100 300 500 1K 3K 5K 10K 23.08K

ETAP Star 12.6.0C

	<b>TCC 25:MCCB1/PNL</b>	
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

Amps X 10 SUB 6 BUS B (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 SUB 6 BUS B (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

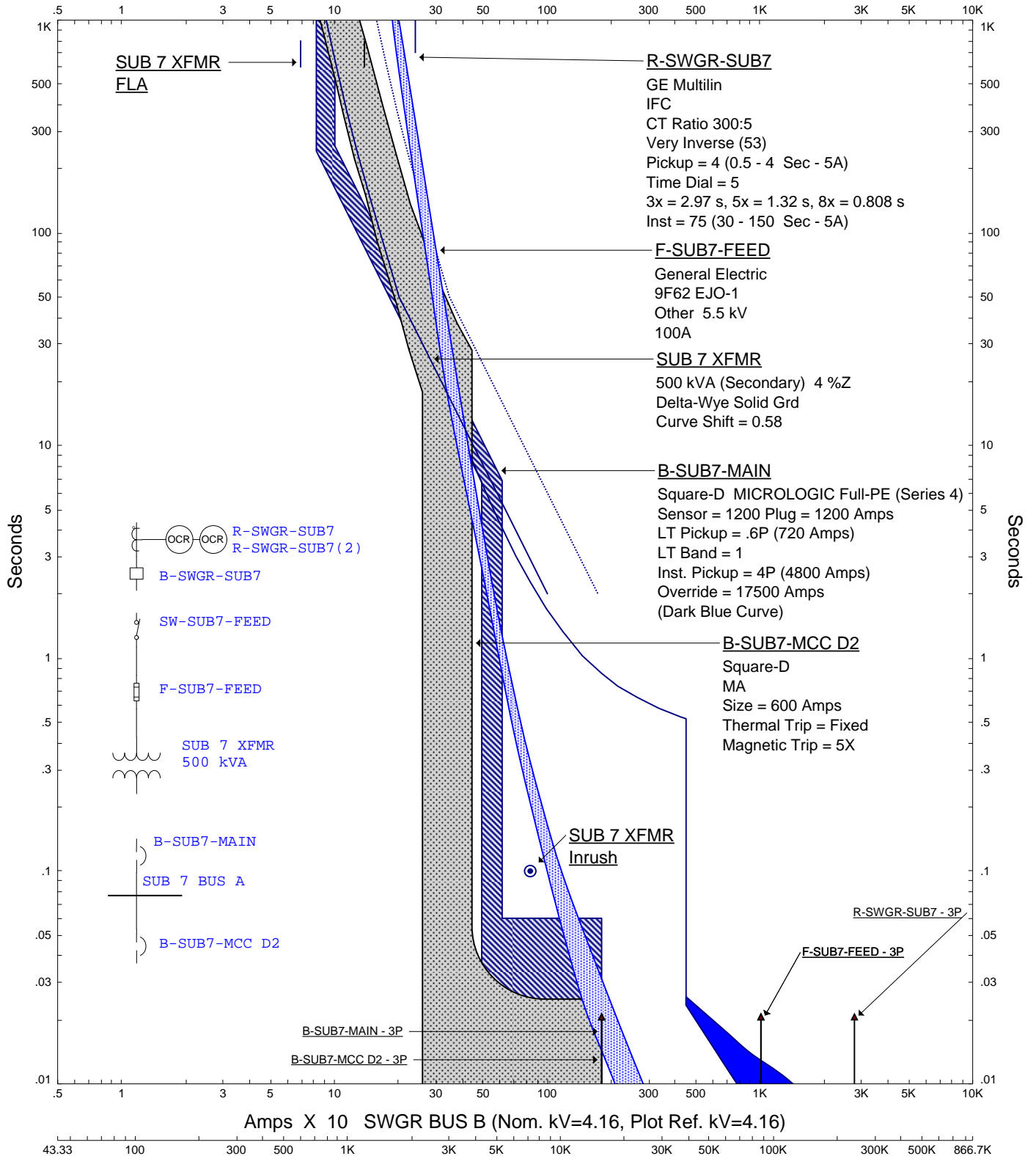
**TCC 26:SUB6/MCCB3/STBY**



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014

Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR BUS B (Nom. kV=4.16, Plot Ref. kV=4.16)

Amps SUB 7 BUS A (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

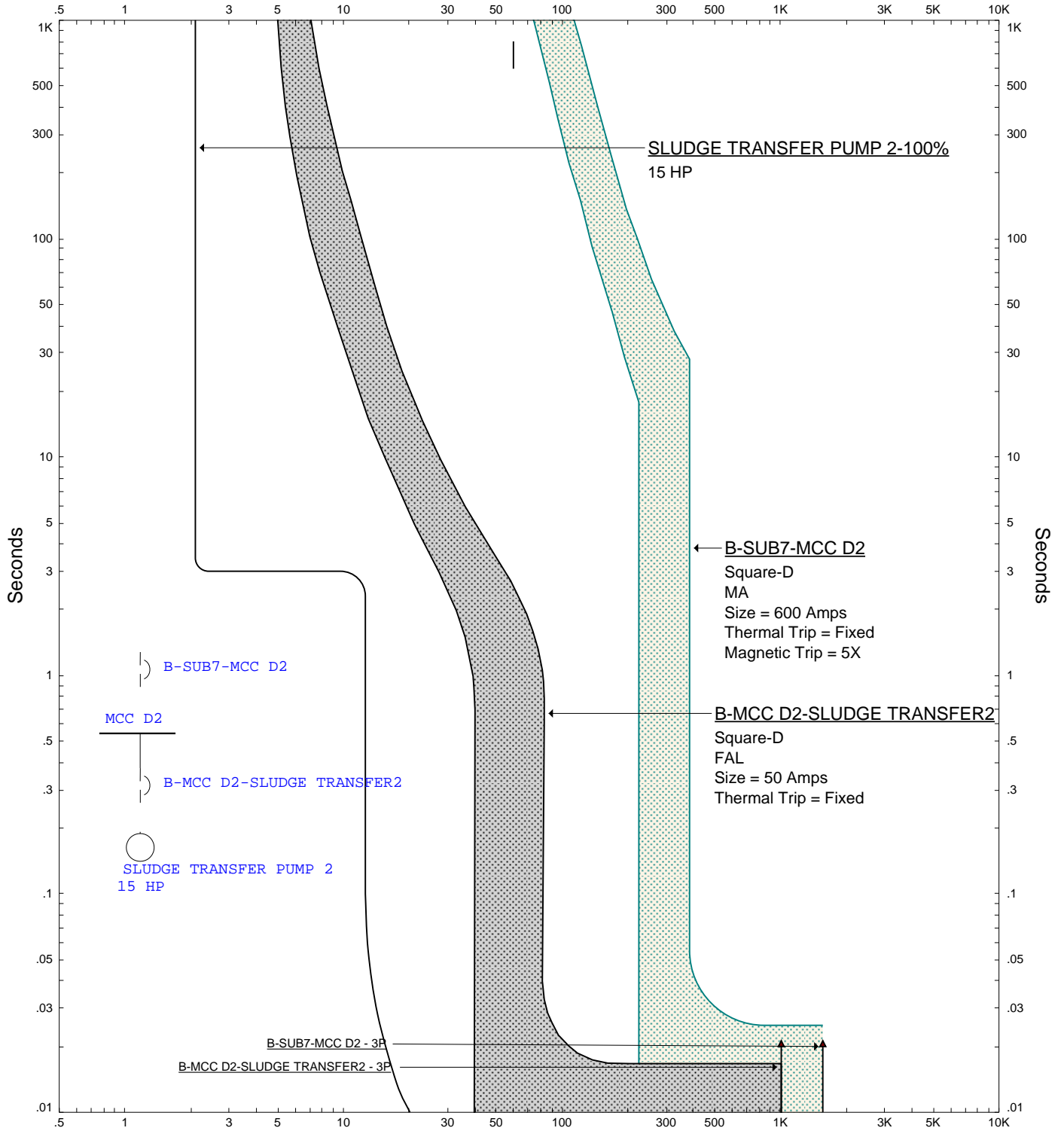
TCC 27:SWGR/SUB7/MCCD2



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW


Date: 04-29-2014

Amps X 10 MCC D2 (Nom. kV=0.48, Plot Ref. kV=0.48)



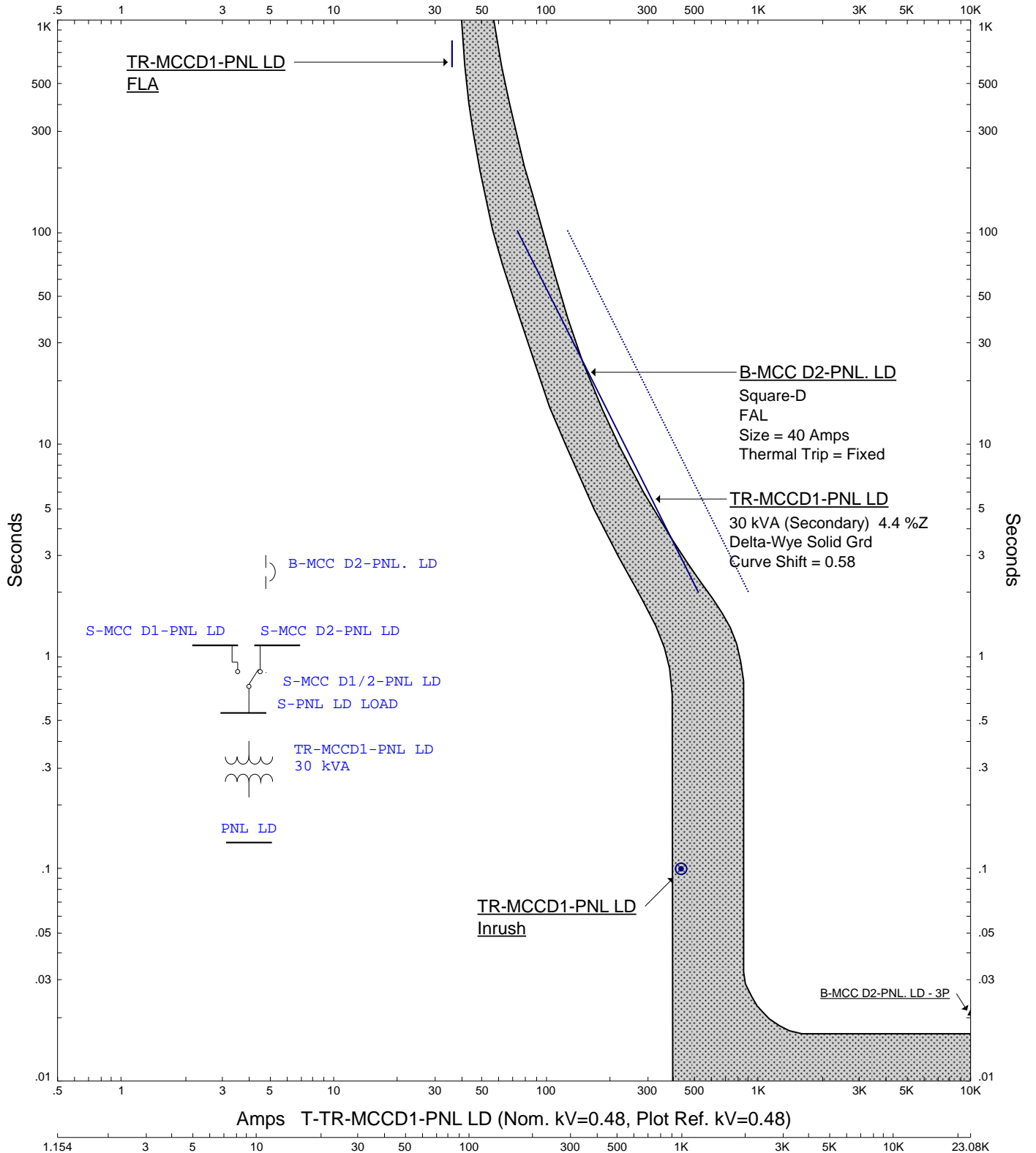
Amps X 10 MCC D2 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 28:SUB7/MCCD2/SLDG</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SwwRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014




Amps T-TR-MCCD1-PNL LD (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps T-TR-MCCD1-PNL LD (Nom. kV=0.48, Plot Ref. kV=0.48)

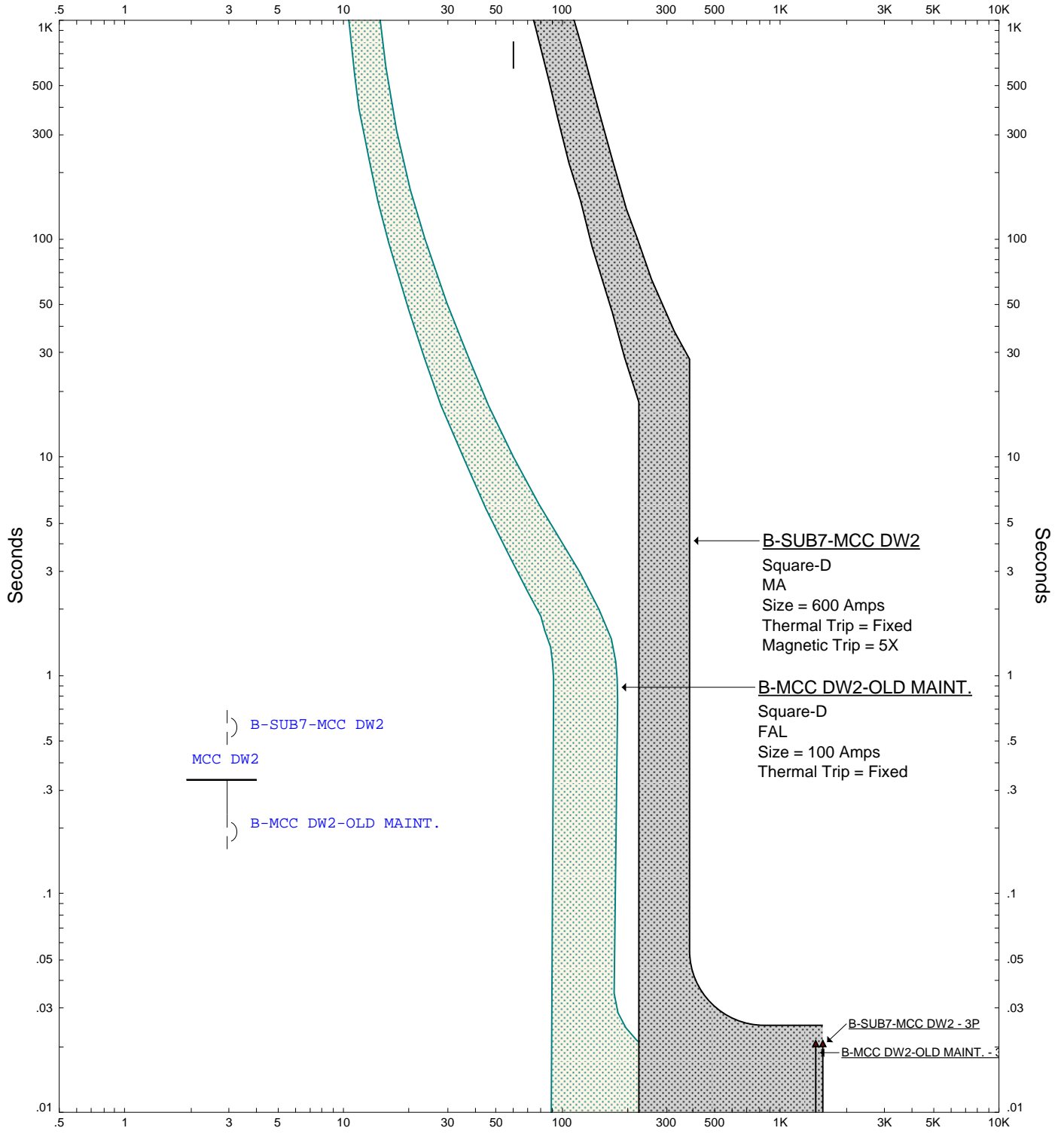
Amps PNL LD (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

	<b>TCC 29:MCCD2/PNL LD</b>	
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014 <div style="text-align: right; font-weight: bold; font-size: 1.2em;">223</div>




Amps X 10 MCC DW2 (Nom. kV=0.48, Plot Ref. kV=0.48)

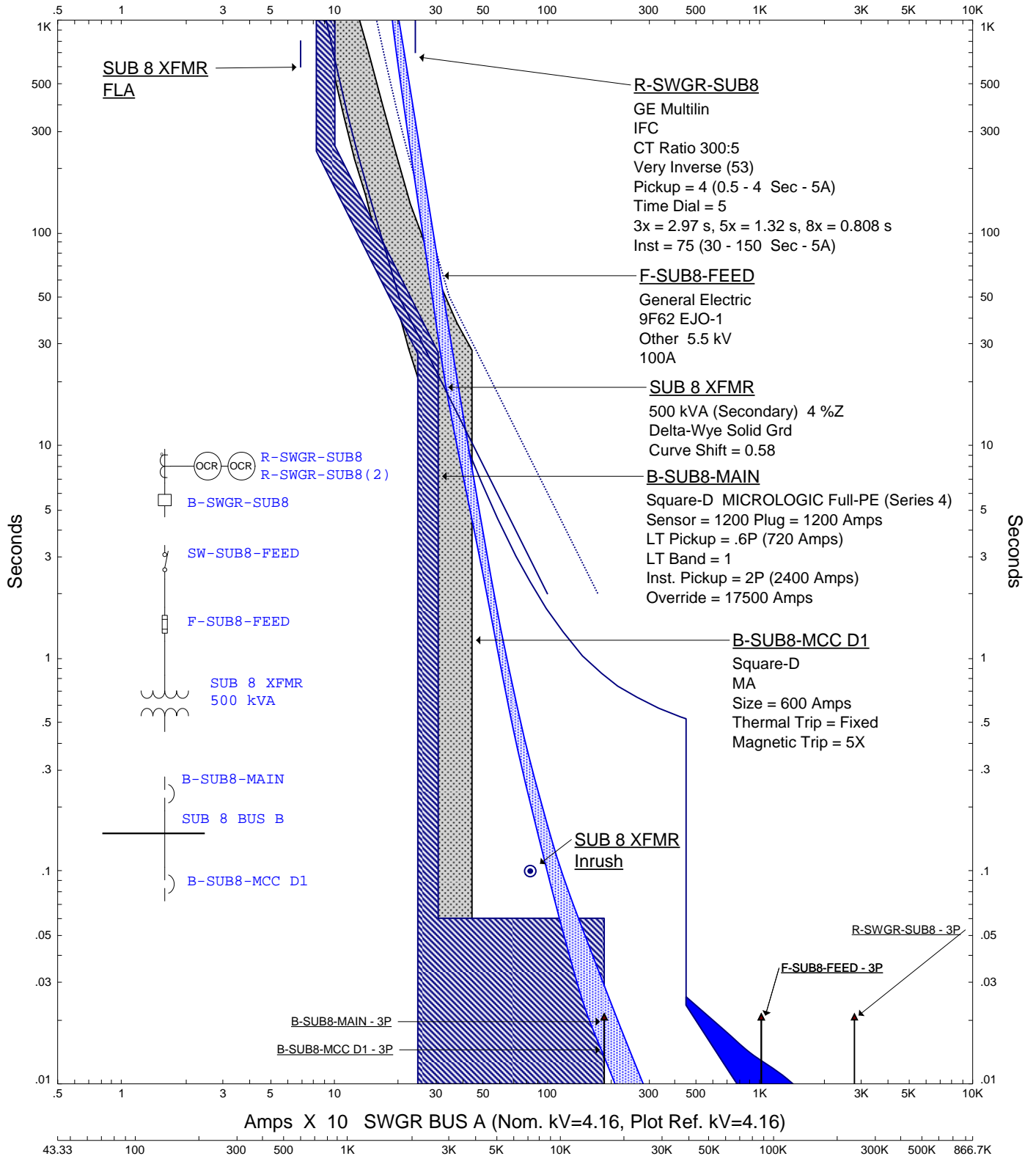


Amps X 10 MCC DW2 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 30:SUB7/MCCDW2/MAINT</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)

43.33 100 300 500 1K 3K 5K 10K 30K 50K 100K 300K 500K 866.7K

Amps SUB 8 BUS B (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

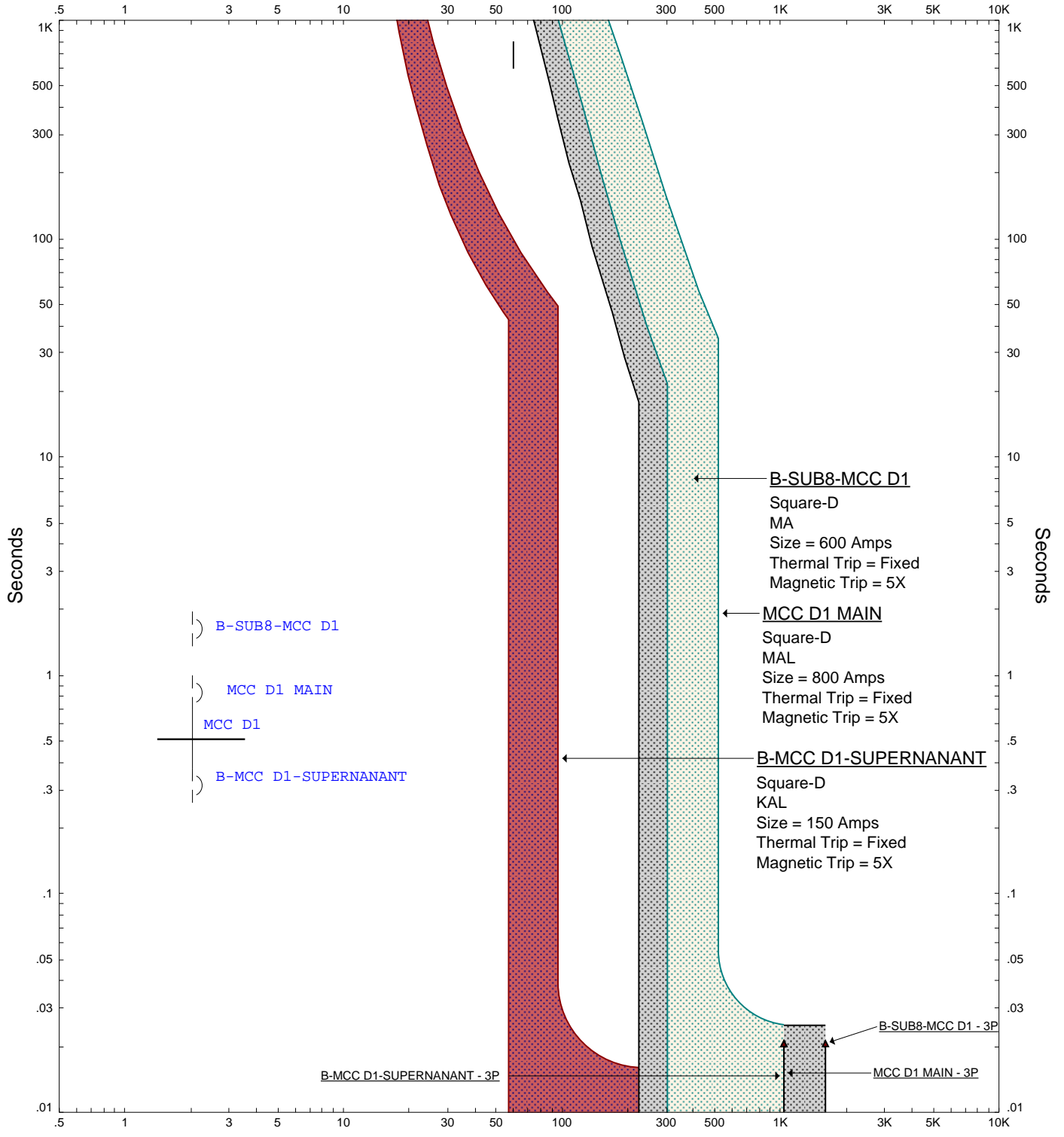
TCC 31:SWGR/SUB8/MCCD1



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW


Date: 04-29-2014

Amps X 10 MCC D1 (Nom. kV=0.48, Plot Ref. kV=0.48)

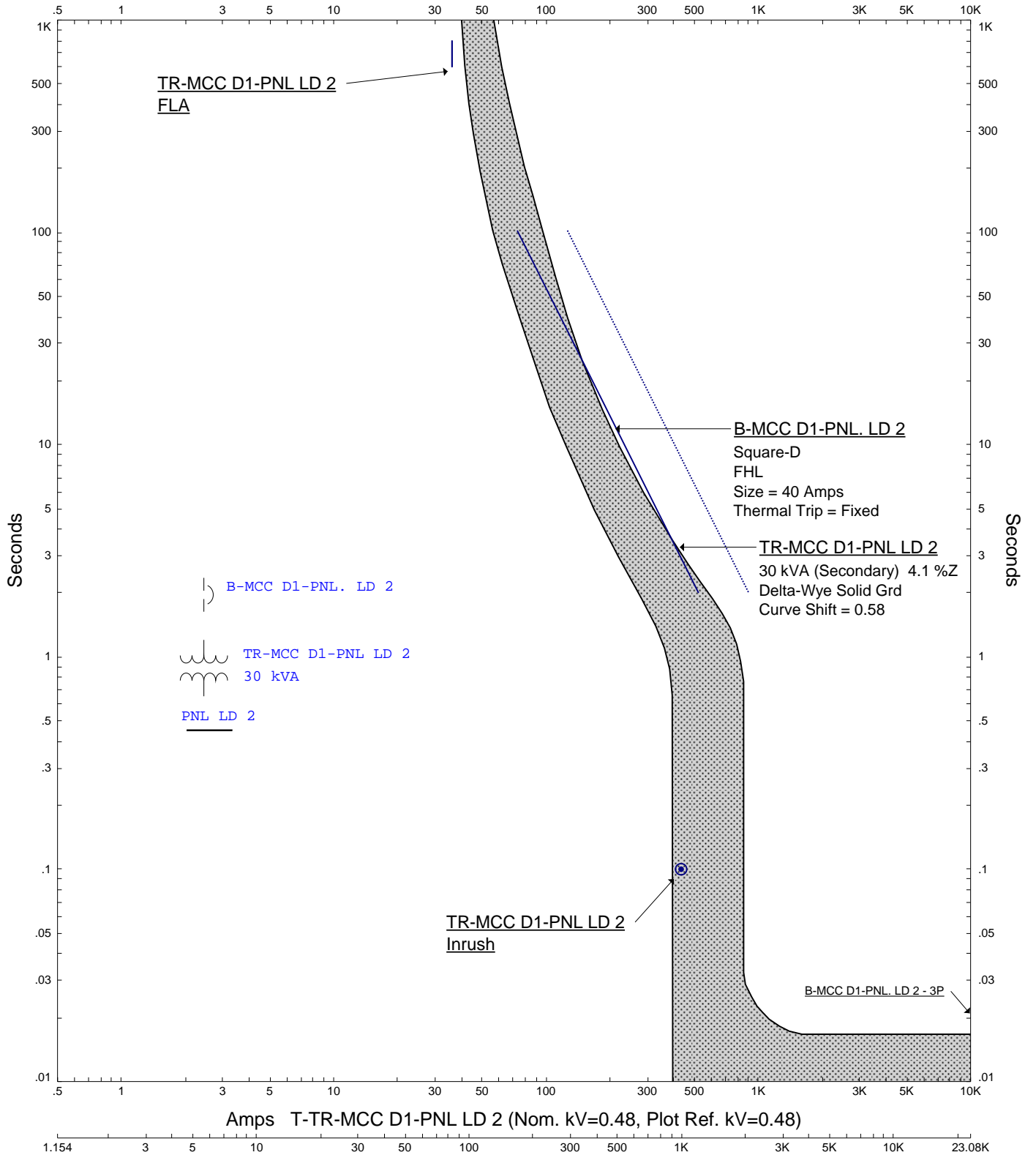


Amps X 10 MCC D1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

	<b>TCC 32:SUB8/MCCD1/SUPER</b>	 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: SwwRF Contract: 8910V.00 Engineer: KTW		Date: 04-29-2014

Amps T-TR-MCC D1-PNL LD 2 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps PNL LD 2 (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

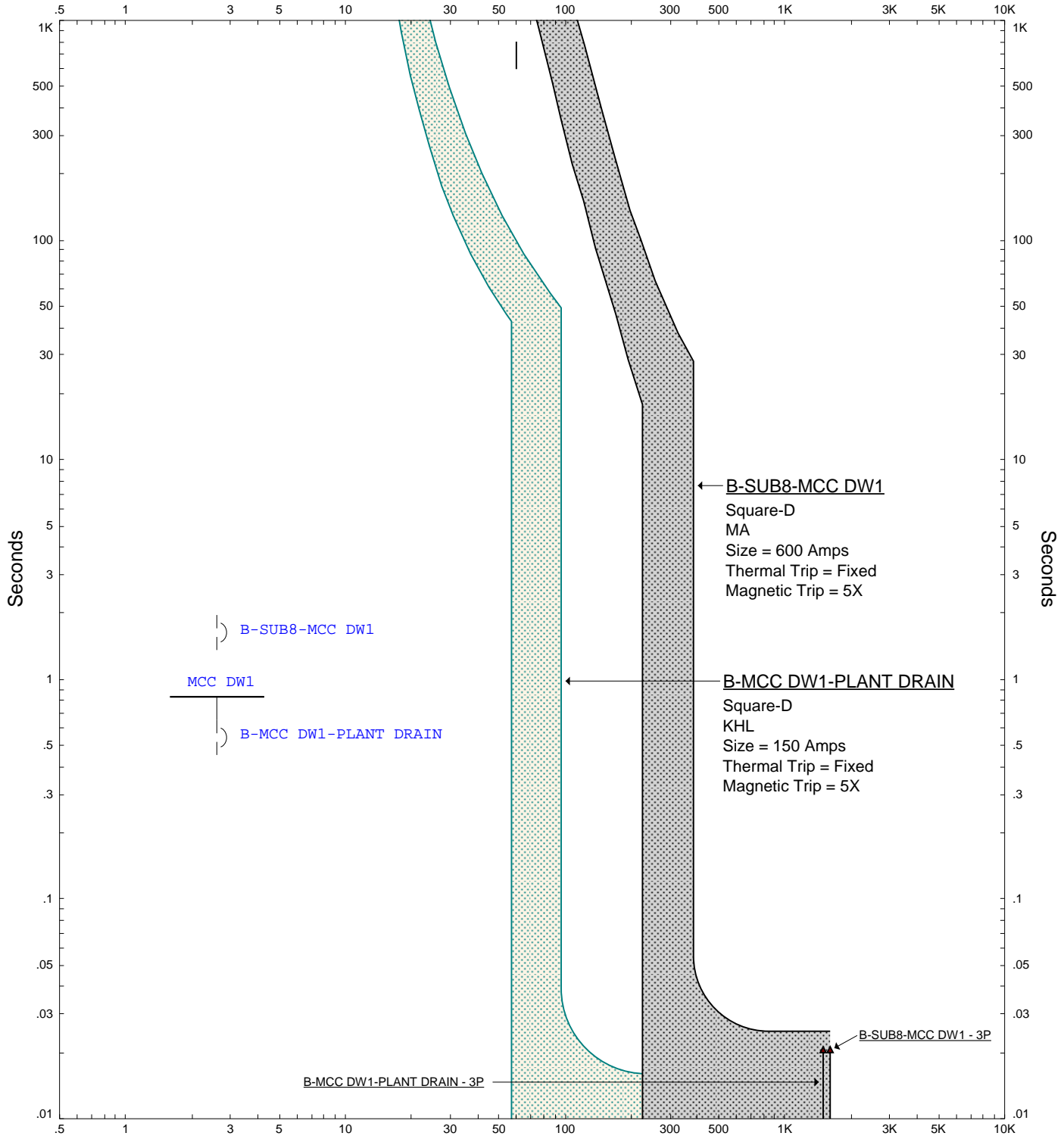
TCC 33:MCCD1/PNL LD2



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014

Amps X 10 MCC DW1 (Nom. kV=0.48, Plot Ref. kV=0.48)



Amps X 10 MCC DW1 (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

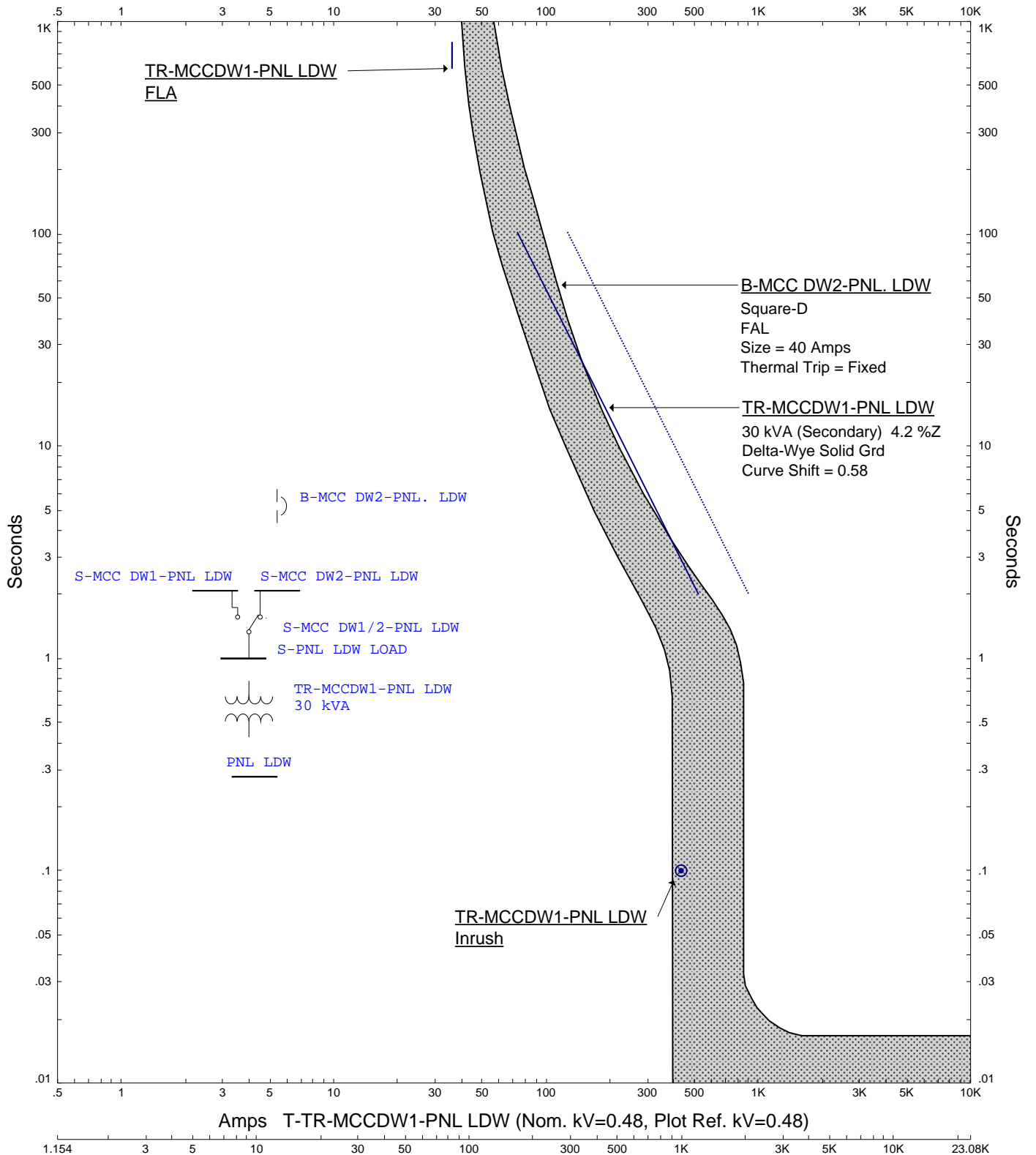
TCC 34:SUB8/MCCDW1/DRAIN



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014

Amps T-TR-MCCDW1-PNL LDW (Nom. kV=0.48, Plot Ref. kV=0.48)



1.154 3 5 10 30 50 100 300 500 1K 3K 5K 10K 23.08K

Amps PNL LDW (Nom. kV=0.208, Plot Ref. kV=0.208)

ETAP Star 12.6.0C

TCC 35:MCCDW2/PNL LDW

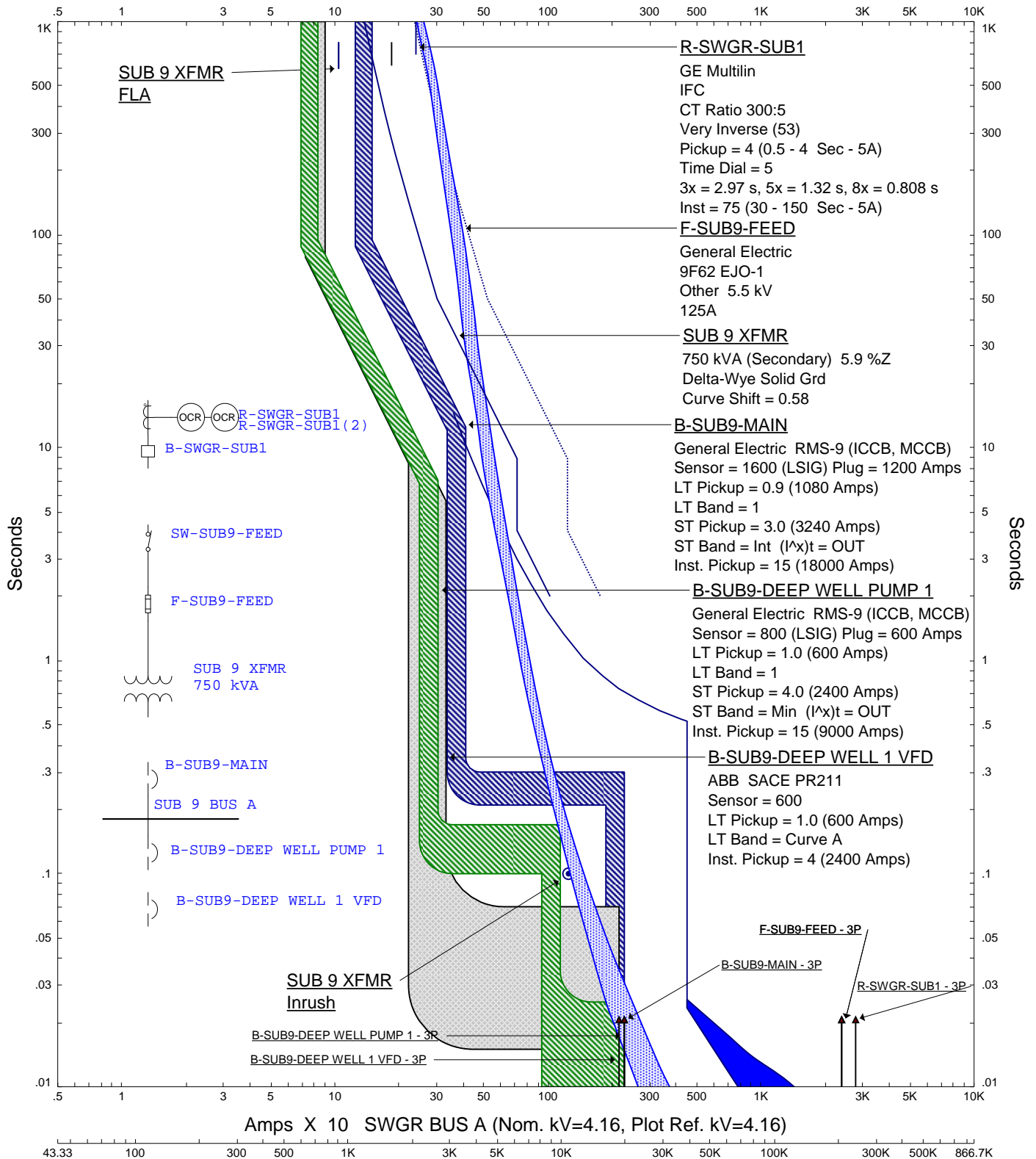


Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW

Date: 04-29-2014



Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR BUS A (Nom. kV=4.16, Plot Ref. kV=4.16)

43.33 100 300 500 1K 3K 5K 10K 30K 50K 100K 300K 500K 866.7K

Amps SUB 9 BUS A (Nom. kV=0.48, Plot Ref. kV=0.48)

ETAP Star 12.6.0C

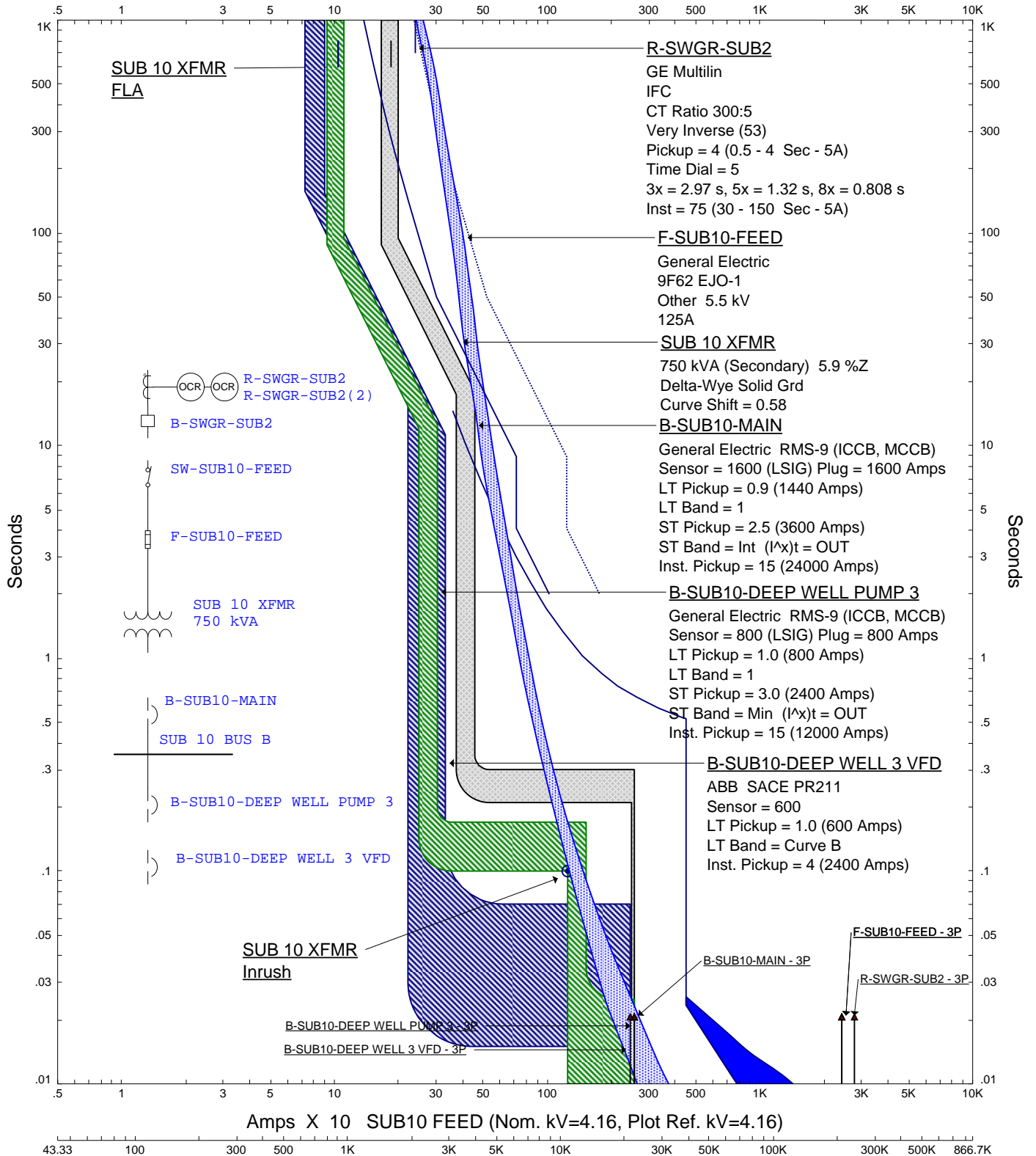
TCC 36:SWGR/SUB9/VFD




Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014

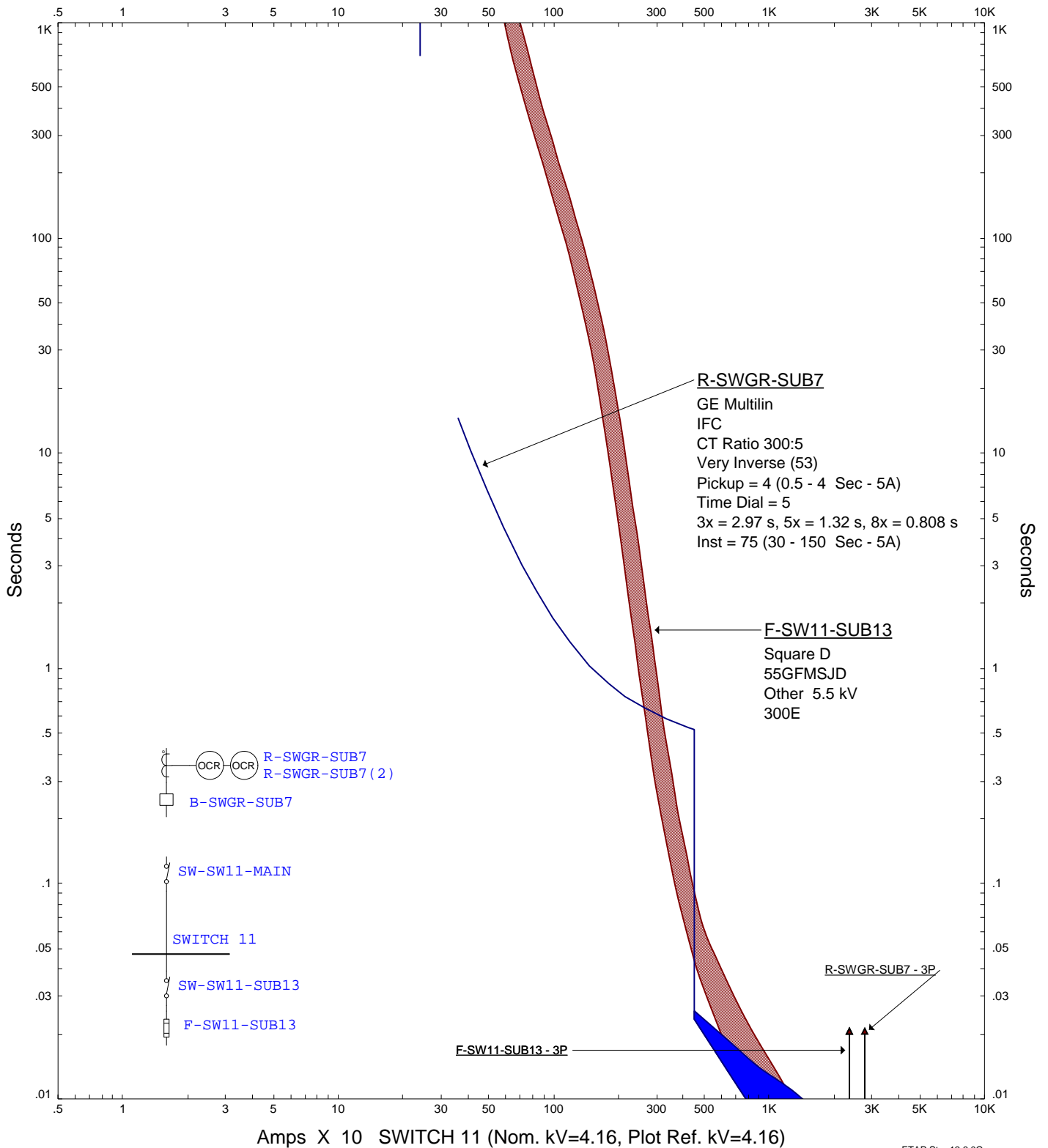
Amps X 10 SUB10 FEED (Nom. kV=4.16, Plot Ref. kV=4.16)



<b>TCC 37:SWGR/SUB10/VFD</b>		ETAP Star 12.6.0C
 Engineers...Working Wonders With Water™		
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW	Date: 04-29-2014	
		<b>231</b>



Amps X 10 SWITCH 11 (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWITCH 11 (Nom. kV=4.16, Plot Ref. kV=4.16)

ETAP Star 12.6.0C

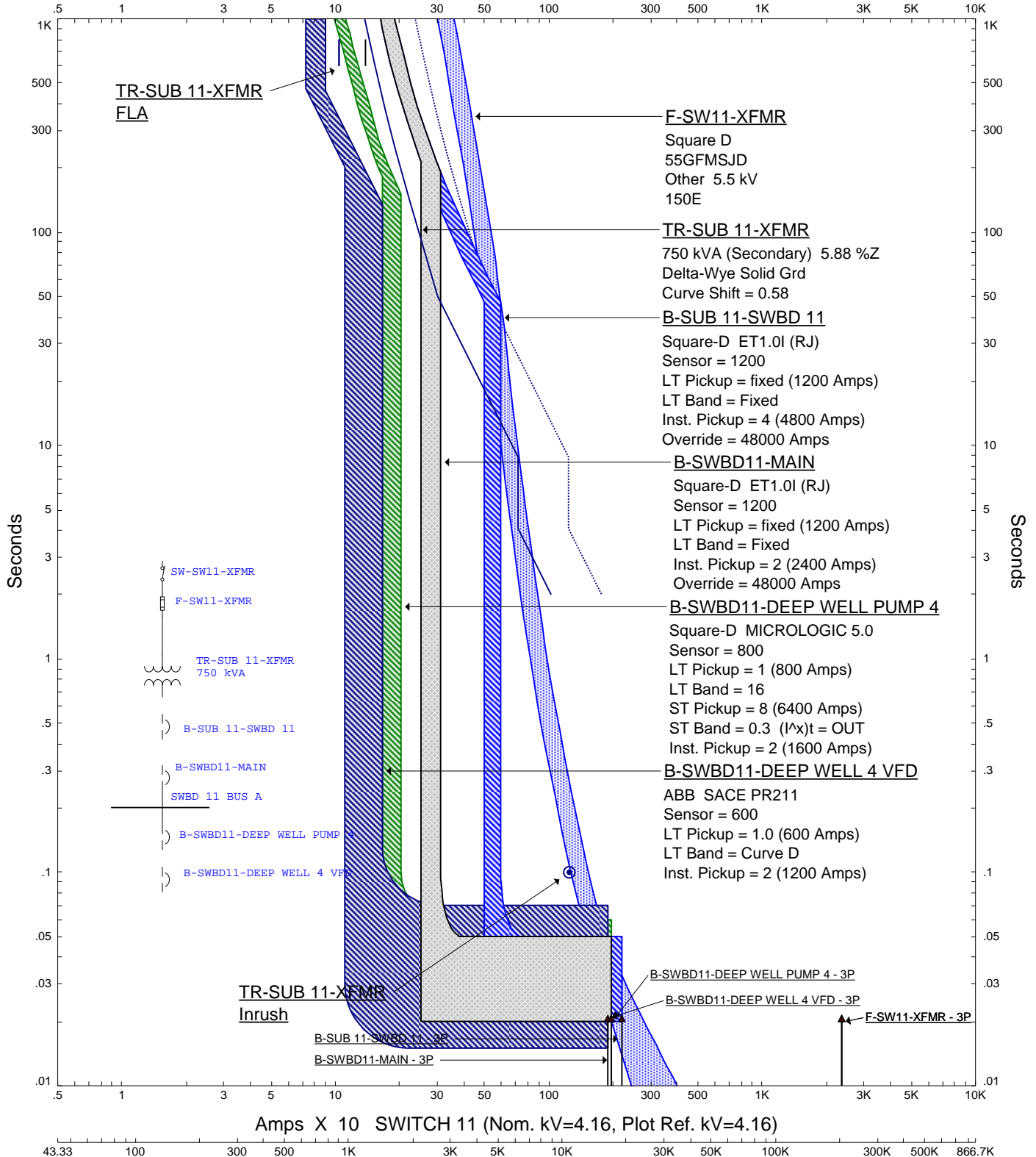
TCC 38:SWGR/SW11/SUB13




Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 04-29-2014

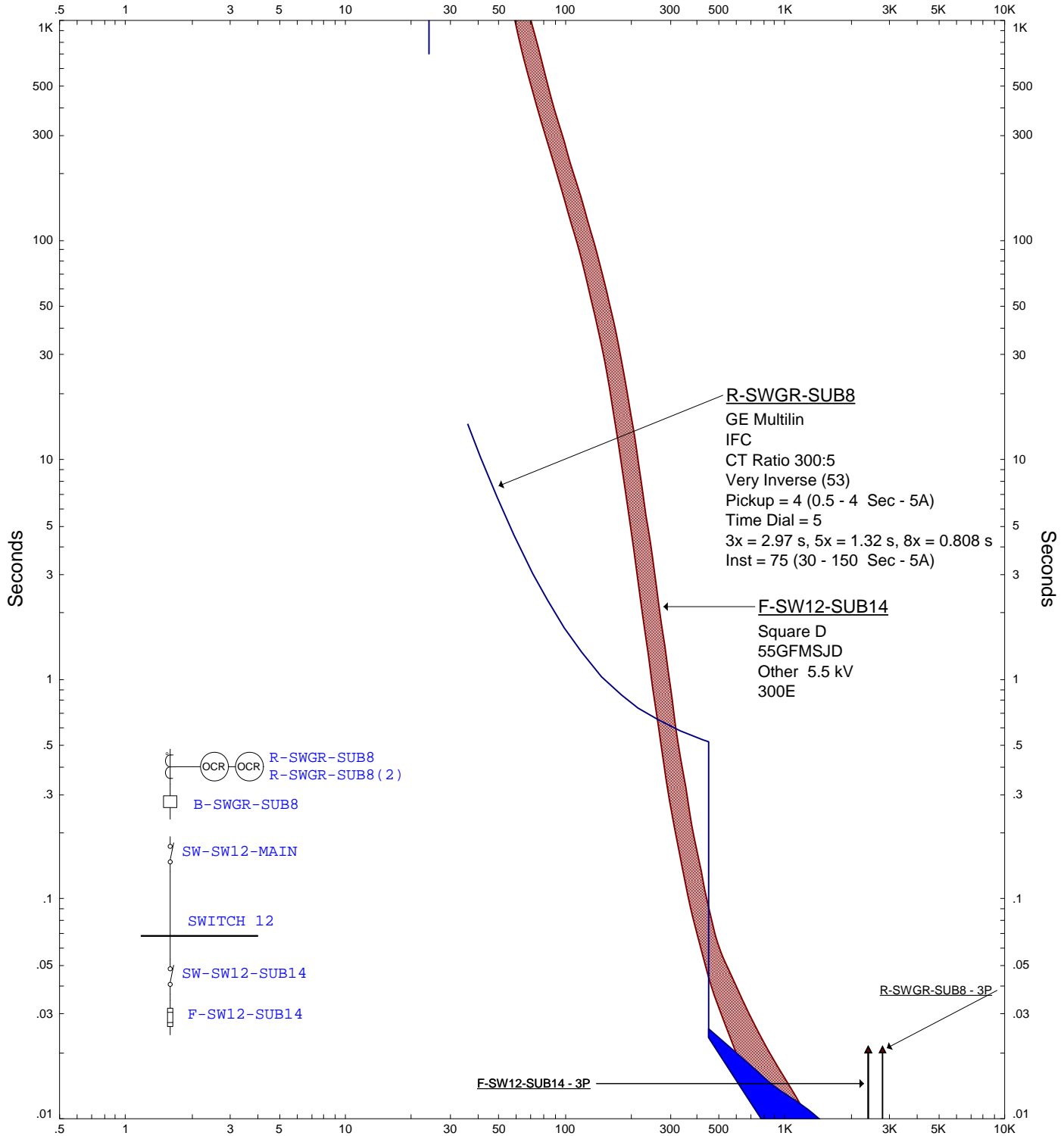
Amps X 10 SWITCH 11 (Nom. kV=4.16, Plot Ref. kV=4.16)



ETAP Star 12.6.0C

<b>TCC 39:SW11/SUB11/VFD</b>		 Engineers...Working Wonders With Water™
Project: MANATEE COUNTY ESS Location: Swwrf Contract: 8910V.00 Engineer: KTW	Date: 04-29-2014	
		233

Amps X 10 SWITCH 12 (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWITCH 12 (Nom. kV=4.16, Plot Ref. kV=4.16)

ETAP Star 12.6.0C

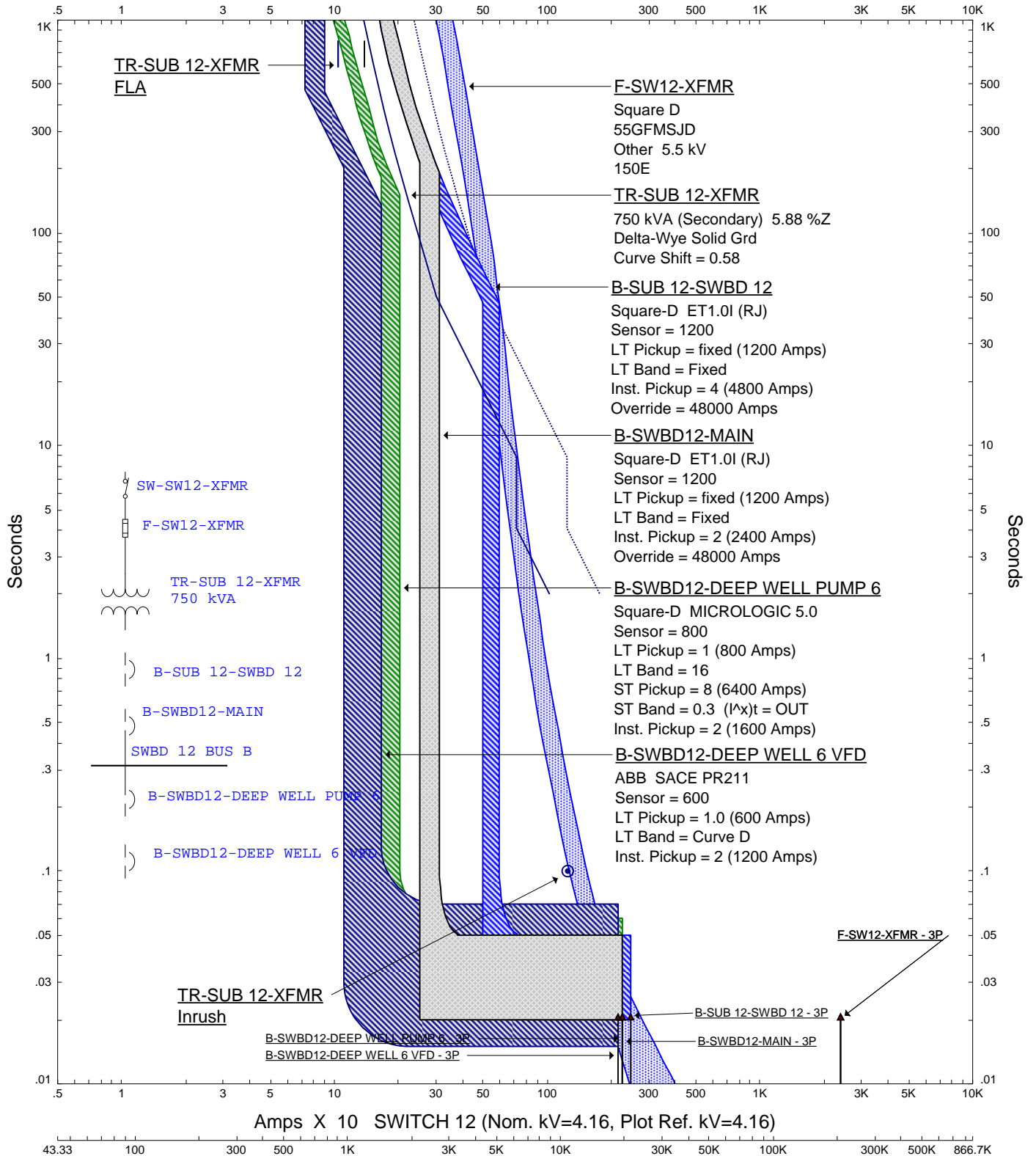
TCC 40:SWGR/SW12/SUB14



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

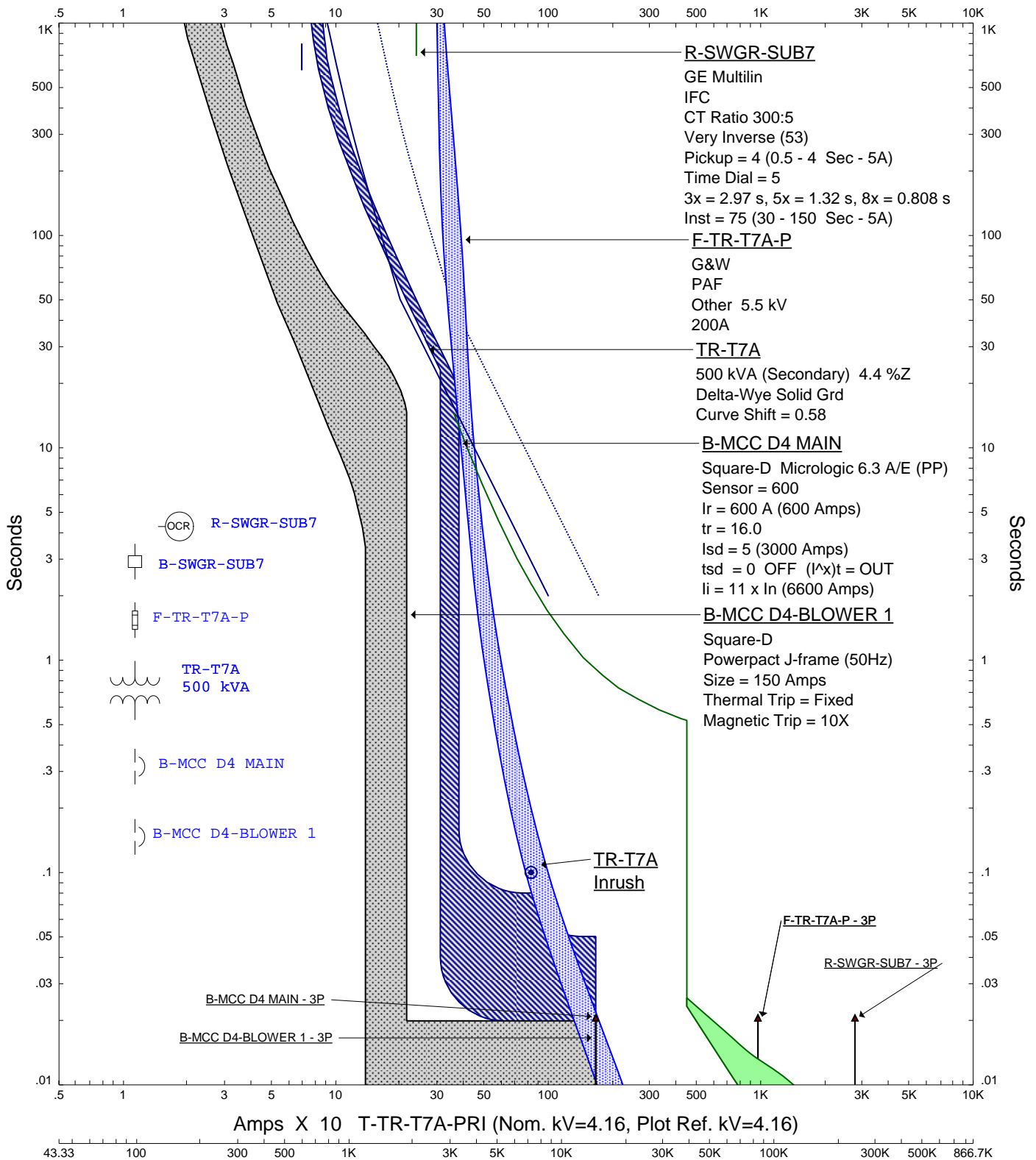
Date: 04-29-2014

Amps X 10 SWITCH 12 (Nom. kV=4.16, Plot Ref. kV=4.16)



	<b>TCC 41:SW12/SUB12/VFD</b>	ETAP Star 12.6.0C
Project: MANATEE COUNTY ESS Location: SWWRF Contract: 8910V.00 Engineer: KTW	Date: 04-29-2014	235

Amps X 10 T-TR-T7A-PRI (Nom. kV=4.16, Plot Ref. kV=4.16)



ETAP Star 12.6.0C

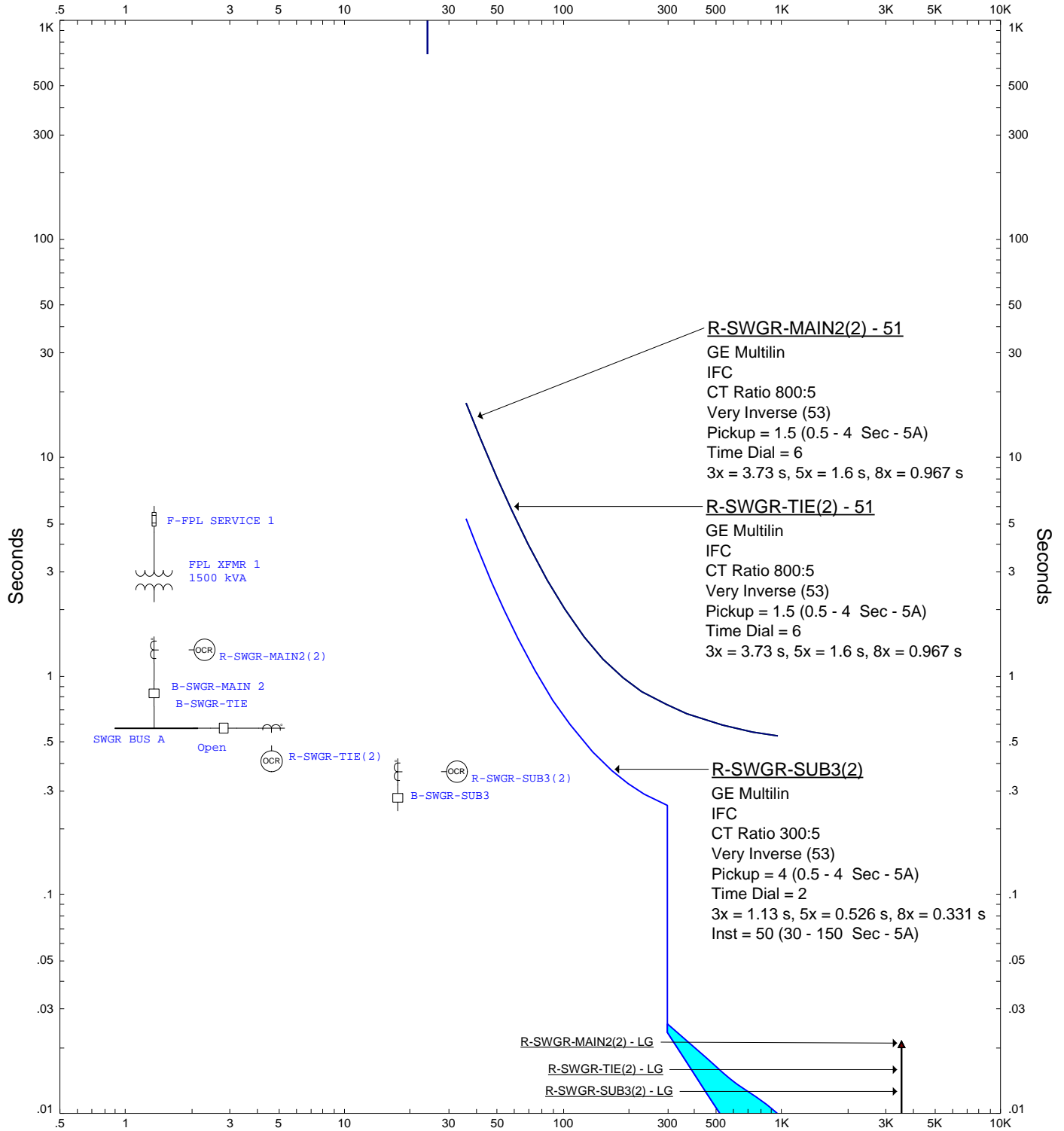
TCC 42:SWGR/MCCD4



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 11-06-2014

Amps X 10 SWGR MAIN 2 LS (Nom. kV=4.16, Plot Ref. kV=4.16)



Amps X 10 SWGR MAIN 2 LS (Nom. kV=4.16, Plot Ref. kV=4.16)

ETAP Star 12.6.0C

TCC 43:MAIN2/TIE/SUB3 G



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW

Date: 11-06-2014  
 Rev: Revision  
 Fault: Ground

**APPENDIX D1 – ARC FLASH STUDY  
(EXISTING SETTINGS)**



ID	kV (kV)	Configuration	Total Energy (cal/cm²)	AFB (ft)	Energy Levels	Final FCT (sec)	Ia at FCT (kA)	Source PD ID	% Ia Variation
54" METER VAULT VALVE	0.48	Generator 1	0.054436	0.3	Level 0	0.026	0.723	B-MCC E1-54" METER VAULT	15%
A/C ROOF UNIT #2	0.48	Normal	0.222541	0.6	Level 0	0.017	4.016	B-MCC E2-A/C ROOF UNIT 2	
ABFV-1	0.48	Normal	0.09184	0.4	Level 0	0.008	3.499	B-MCC 1-ABFV-1	
ABFV-2	0.48	Normal	0.080594	0.4	Level 0	0.008	3.1	B-MCC 1-ABFV-2	
ABFV-3	0.48	Normal	0.071587	0.4	Level 0	0.008	2.778	B-MCC 1-ABFV-3	
ABFV-4	0.48	Normal	0.064279	0.3	Level 0	0.008	2.515	B-MCC 1-ABFV-4	
ABFV-5	0.48	Normal	0.058265	0.3	Level 0	0.008	2.297	B-MCC 1-ABFV-5	
ABW #1 EFF. WEIR GATE	0.48	Generator 1	0.054436	0.3	Level 0	0.026	0.723	B-MCC E1-EFF. WEIR GATE	15%
ABW #1 FESTON SYSTEM	0.48	Generator 1	0.168206	0.6	Level 0	0.035	1.558	B-MCC-E1 ABW #1 FESTON	15%
ABW #1 INF. WEIR GATE	0.48	Generator 1	0.053521	0.3	Level 0	0.025	0.75	B-MCC E1-INF. WEIR GATE	15%
ABW #1 SLUICE GATE #1	0.48	Generator 1	0.263006	0.7	Level 0	0.378	0.591	B-MCC E2-ABW #1 SLUICE 1	
ABW #3 FESTON SYSTEM	0.48	Normal	0.093136	0.4	Level 0	0.017	1.794	B-MCC-E2 ABW #3 FESTON	
ABW #3,4,5 FESTON SYSTEM	0.48	Generator 1	0.066773	0.4	Level 0	0.023	0.97	B-MCC E2-ABW 3,4,5 FESTON	15%
ABW 3,4,5 FLOCCULATOR	0.48	Normal	0.010712	0.1	Level 0	0.016	0.569	B-MCC E2-ABW 3,4,5 FLOCC	
ABW #3,4,6 FESTON SYSTEM	0.48	Normal	0.06765	0.4	Level 0	0.019	1.189	B-MCC E1-ABW 3,4,6 FESTON	
ABW #3,4,6 SLUICE GATE	0.48	Generator 1	0.067508	0.4	Level 0	0.035	0.675	B-MCC-E1 ABW 3,5,6 SLUICE	15%
ABW #5 SLUICE GATE	0.48	Generator 1	0.061521	0.3	Level 0	0.029	0.723	B-MCC-E1 ABW #5 SLUICE	15%
ABW #6 FESTON SYSTEM	0.48	Normal	0.093259	0.4	Level 0	0.017	1.796	B-MCC-E1 ABW #6 FESTON	
ABW #6 SLUICE GATE	0.48	Generator 1	0.056154	0.3	Level 0	0.028	0.698	B-MCC-E1 ABW #6 SLUICE	15%
ABW 6,7 FLASH MIXER #3	0.48	Generator 1	0.056216	0.3	Level 0	0.031	0.632	B-MCC E2-ABW 6,7FLASH MIX	15%
ABW #7 FESTON SYSTEM	0.48	Normal	0.083932	0.4	Level 0	0.017	1.63	B-MCC E2-ABW #7 FESTON	
ABW FILTER #2	0.48	Normal	0.08985	0.4	Level 0	0.017	1.736	B-MCC E2-ABW FILTER 2	
ABW SLUICE GATE	0.48	Generator 2	0.410103	0.9	Level 0	0.616	0.559	B-MCC E2-ABW SLUICE GATE	
ACU-1	0.48	Normal	0.128925	0.5	Level 0	0.008	4.788	B-MCC 1-ACU 1	
AFD-MCC D1-THICKENER	0.48	Normal	0.279095	0.7	Level 0	0.017	4.952	B-MCC D1-THICKENER	
AIR COMPRESSOR	0.48	Normal	0.380111	0.8	Level 0	0.017	6.594	B-MCC B1-AIR COMPRESSOR	
AIR COMPRESSOR 2	0.48	Normal	0.361854	0.8	Level 0	0.017	6.297	B-MCC B1-AIR COMPRESSOR 2	
BASIN 1 ADFV 13	0.48	Normal	0.120217	0.5	Level 0	0.017	2.272	B-MCC B4-ADVF 13	
BASIN 2 ADFV 14	0.48	Normal	0.097737	0.4	Level 0	0.017	1.876	B-MCC B4-ADVF 14	
BASIN 3 ADFV 15	0.48	Normal	0.077781	0.4	Level 0	0.017	1.519	B-MCC B4-ADVF 15	
BASIN 4 ADFV 16	0.48	Normal	0.065662	0.4	Level 0	0.017	1.28	B-MCC B4-ADVF 16	
BELT FILTER PRESS 1	0.48	Normal	0.256049	0.7	Level 0	0.017	4.572	B-MCC DW1-BFP 1	
BELT FILTER PRESS 2	0.48	Normal	0.253415	0.7	Level 0	0.017	4.529	B-MCC DW2-BFP 2	
BELT FILTER PRESS 3	0.48	Normal	0.293294	0.7	Level 0	0.017	5.184	B-MCC DW1-BFP 3	
BELT FILTER PRESS 4	0.48	Normal	0.297171	0.7	Level 0	0.017	5.248	B-MCC DW1-BFP 4	
BELT FILTER PRESS 5	0.48	Normal	0.350897	0.8	Level 0	0.017	6.12	B-MCC DW1-BFP 5	
BELT FILTER PRESS 6	0.48	Normal	0.350765	0.8	Level 0	0.017	6.118	B-MCC DW1-BFP 6	
BLOWER #6 INLET VALVE	0.48	Normal	0.299507	0.7	Level 0	0.017	5.286	B-MCC 1-BLOWER #6 INLET	
BLOWER A LS	4.16	Normal	2.02	2.6	Level 1	0.099	9.416	B-SWGR-SUB3	
BLOWER B LS	4.16	Normal	2.04	2.6	Level 1	0.099	9.531	B-SWGR-SUB4	
BLOWER BUS A	4.16	Generator 2	1.47	1.8	Level 1	0.279	2.193	B-SWGR-SUB3	
BLOWER BUS B	4.16	Generator 2	1.5	1.9	Level 1	0.281	2.218	B-SWGR-SUB4	
CLARIFIER 1 CP	0.48	Normal	0.065317	0.3	Level 0	0.017	1.294	B-DP2-CLARIFIER1	
CLARIFIER 2 CP	0.48	Normal	0.065652	0.4	Level 0	0.017	1.3	B-DP4-CLARIFIER	
CLARIFIER 5 CP	0.48	Normal	0.065218	0.3	Level 0	0.017	1.292	B-DP1-CLARIFIER	
CONVEYOR CP	0.48	Normal	0.198997	0.6	Level 0	0.017	3.622	B-MCC DW2-CONVEYOR CP	
D-DP1-RAS PUMP 7	0.48	Normal	0.125311	0.5	Level 0	0.017	3.696	B-DP1-RAS 7	
D-DP1-RAS PUMP 8	0.48	Normal	0.125311	0.5	Level 0	0.017	3.696	B-DP1-RAS 8	
D-DP1-WAS 5	0.48	Normal	0.246856	0.7	Level 0	0.016	4.573	B-MCC E1-PNL DP #1	
D-DP1-WAS 6	0.48	Normal	0.246856	0.7	Level 0	0.016	4.573	B-MCC E1-PNL DP #1	
D-DP2-RAS PUMP 1	0.48	Normal	0.109298	0.5	Level 0	0.017	3.255	B-DP2-RAS 1	
D-DP2-RAS PUMP 3	0.48	Normal	0.109298	0.5	Level 0	0.017	3.255	B-DP2-RAS 3	
D-DP2-WAS 1	0.48	Normal	0.256839	0.7	Level 0	0.017	4.605	B-DP2-WAS 1	
D-DP2-WAS 2	0.48	Normal	0.256839	0.7	Level 0	0.017	4.605	B-DP2-WAS 2	
D-DP4-RAS PUMP 2	0.48	Normal	0.131006	0.5	Level 0	0.016	3.912	B-MCC E2-PNL DP #4	
D-DP4-WAS 2	0.48	Normal	0.253921	0.7	Level 0	0.016	4.64	B-MCC E2-PNL DP #4	
D-DP4-WAS PUMP 2	0.48	Normal	0.061664	0.3	Level 0	0.017	1.916	B-DP4-WAS 2(2)	
D-MCC 1-EXHAUST 1	0.48	Normal	0.059442	0.3	Level 0	0.016	1.916	B-MCC 1-EXHAUST 1	
D-MCC 1-EXHAUST 2	0.48	Normal	0.059442	0.3	Level 0	0.016	1.916	B-MCC 1-EXHAUST 2	
D-MCC 1-EXHAUST 3	0.48	Normal	0.059442	0.3	Level 0	0.016	1.916	B-MCC 1-EXHAUST 3	
D-MCC 1-EXHAUST 4	0.48	Normal	0.059442	0.3	Level 0	0.016	1.916	B-MCC 1-EXHAUST 4	
D-MCC B1-AIR BLOWER	0.48	Normal	0.205632	0.6	Level 0	0.016	5.957	B-MCC B1-AIR BLOWER	
D-MCC B1-DAF THICK 2	0.48	Normal	0.065086	0.3	Level 0	0.017	2.003	B-MCC B1-DAF THICK 2	
D-MCC B1-EAST DAF RECYC	0.48	Normal	0.201457	0.6	Level 0	0.016	5.816	B-MCC B1-EAST DAF RECYC	
D-MCC B1-PRESSURIZATION	0.48	Normal	0.178662	0.6	Level 0	0.017	4.931	B-MCC B1-PRESSURIZATION	
D-MCC B1-THICK WAS 3	0.48	Normal	0.179676	0.6	Level 0	0.017	5.104	B-MCC B1-THICK WAS 3	
D-MCC B1-THICK WAS 4	0.48	Normal	0.179676	0.6	Level 0	0.017	5.104	B-MCC B1-THICK WAS 4	
D-MCC B1-WEST DAF RECYC	0.48	Normal	0.201457	0.6	Level 0	0.016	5.816	B-MCC B1-WEST DAF RECYC	
D-MCC B2-AIR COMPRESSOR	0.48	Normal	0.132846	0.5	Level 0	0.017	3.783	B-MCC B2-AIR COMPRESSOR	
D-MCC B2-EQ DIVERSION VLV	0.48	Normal	0.061657	0.3	Level 0	0.017	1.905	B-MCC B2-EQ DIVERSION VLV	
D-MCC B2-RETURN SLUDGE 1	0.48	Normal	0.089707	0.4	Level 0	0.017	2.695	B-MCC B2-RETURN SLUDGE 1	
D-MCC B2-RETURN SLUDGE 2	0.48	Normal	0.111977	0.5	Level 0	0.017	3.308	B-MCC B2-RETURN SLUDGE 2	
D-MCC B2-RETURN SLUDGE 3	0.48	Normal	0.099611	0.4	Level 0	0.017	2.969	B-MCC B2-RETURN SLUDGE 3	
D-MCC B2-RETURN SLUDGE 4	0.48	Normal	0.099611	0.4	Level 0	0.017	2.969	B-MCC B2-RETURN SLUDGE 4	
D-MCC B2-RETURN SLUDGE 5	0.48	Normal	0.089707	0.4	Level 0	0.017	2.695	B-MCC B2-RETURN SLUDGE 5	
D-MCC B3-STANDBY PRESSURE	0.48	Normal	0.178502	0.6	Level 0	0.016	5.299	B-MCC B3-STANDBY PRESSURE	
D-MCC D1-BFP FEED PUMP	0.48	Normal	0.079077	0.4	Level 0	0.017	2.336	B-MCC D1-BFP FEED PUMP	
D-MCC D1-BFP FEED PUMP5	0.48	Normal	0.083004	0.4	Level 0	0.017	2.448	B-MCC D1-BFP FEED PUMP5	
D-MCC D1-GRAVITY THICK	0.48	Normal	0.019927	0.2	Level 0	0.008	1.324	B-MCC D1-GRAVITY THICK	
D-MCC D1-SLUDGE RECIRC 1	0.48	Normal	0.120403	0.5	Level 0	0.017	3.509	B-MCC D1-SLUDGE RECIRC 1	
D-MCC D1-SLUDGE RECIRC 3	0.48	Normal	0.11201	0.5	Level 0	0.017	3.272	B-MCC D1-SLUDGE RECIRC 3	
D-MCC D1-SLUDGE RECIRC 4	0.48	Normal	0.103007	0.4	Level 0	0.017	3.063	B-MCC D1-SLUDGE RECIRC 4	
D-MCC D1-SLUDGE TRANSFER 1	0.48	Normal	0.130094	0.5	Level 0	0.017	3.781	B-MCC D1-SLUDGE TRANSFER 1	
D-MCC D1-THICKENER	0.48	Normal	0.04228	0.3	Level 0	0.017	1.331	B-MCC D1-THICKENER	
D-MCC D2-BFP FEED PUMP1	0.48	Normal	0.095996	0.4	Level 0	0.017	2.818	B-MCC D2-BFP FEED PUMP1	
D-MCC D2-BFP FEED PUMP4	0.48	Normal	0.074137	0.4	Level 0	0.017	2.195	B-MCC D2-BFP FEED PUMP4	
D-MCC D2-BFP FEED PUMP6	0.48	Normal	0.066609	0.4	Level 0	0.017	1.979	B-MCC D2-BFP FEED PUMP6	



ID	kV (kV)	Configuration	Total Energy (cal/cm²)	AFB (ft)	Energy Levels	Final FCT (sec)	Ia at FCT (kA)	Source PD ID	% Ia Variation
D-MCC D2-SLUDGE RECIRC 2	0.48	Normal	0.094129	0.4	Level 0	0.017	2.765	B-MCC D2-SLUDGE RECIRC 2	
D-MCC D2-SLUDGE TRANSFER2	0.48	Normal	0.045969	0.3	Level 0	0.017	1.394	B-MCC D2-SLUDGE TRANSFER2	
D-MCC D2-SLUDGE TRANSFER3	0.48	Normal	0.084162	0.4	Level 0	0.017	2.54	B-MCC D2-SLUDGE TRANSFER3	
D-MCC D2-SLUDGE TRANSFER4	0.48	Normal	0.131293	0.5	Level 0	0.017	3.833	B-MCC D2-SLUDGE TRANSFER4	
D-MCC DW1-PLANT DRAIN1	0.48	Normal	0.053807	0.3	Level 0	0.018	1.566	B-MCC DW1-PLANT DRAIN	
D-MCC DW1-PLANT DRAIN2	0.48	Normal	0.053807	0.3	Level 0	0.018	1.566	B-MCC DW1-PLANT DRAIN	
D-MCC DW1-PLANT DRAIN3	0.48	Normal	0.053807	0.3	Level 0	0.018	1.566	B-MCC DW1-PLANT DRAIN	
D-MCC E1-EF-7	0.48	Normal	0.058239	0.3	Level 0	0.017	1.807	B-MCC E1-EF-7	
D-MCC E1-FLASH MIXER 1	0.48	Normal	0.005152	0.1	Level 0	0.008	0.53	B-MCC E1-FLASH MIXER 1	
D-MCC E1-FLASH MIXER 2	0.48	Normal	0.010759	0.1	Level 0	0.008	0.748	B-MCC E1-FLASH MIXER 2	
D-MCC E2-EF-5.1	0.48	Normal	0.036999	0.3	Level 0	0.016	1.236	B-MCC E2-EF-5.1	
D-MCC E2-EF-5.2	0.48	Normal	0.036999	0.3	Level 0	0.016	1.236	B-MCC E2-EF-5.2	
D-MCC HW1-CONVEYOR EAST	0.48	Normal	0.080385	0.4	Level 0	0.016	2.533	B-MCC HW1-CONVEYOR EAST	
D-MCC HW1-FINAL CLAR. 3	0.48	Normal	0.005057	0.1	Level 0	0.016	0.269	B-MCC HW1-FINAL CLAR. 3	
D-MCC HW1-FINAL CLAR. 4	0.48	Normal	0.005132	0.1	Level 0	0.016	0.273	B-MCC HW1-FINAL CLAR. 4	
D-MCC HW1-GRIT CLASS WEST	0.48	Normal	0.03622	0.3	Level 0	0.02	0.969	B-MCC HW1-GRIT CLASS WEST	
D-MCC HW1-PRI. SLUDGE	0.48	Normal	0.377114	0.8	Level 0	0.84	0.382	B-MCC HW1-PRI. SLUDGE	
D-MCC HW1-RSP 4	0.48	Normal	0.09963	0.4	Level 0	0.019	2.639	B-MCC HW1-RSP 4	
D-MCC HW1-RSP 5	0.48	Normal	0.09963	0.4	Level 0	0.019	2.639	B-MCC HW1-RSP 5	
D-MCC HW1-WEST CONVEYOR	0.48	Normal	0.027518	0.2	Level 0	0.016	0.94	B-MCC HW1-WEST CONVEYOR	
D-MCC HW2-GRIT CLASS 2	0.48	Normal	0.044293	0.3	Level 0	0.017	1.37	B-MCC HW2-GRIT CLASS 2	
D-MCC HW2-GRIT PUMP 2	0.48	Normal	0.075771	0.4	Level 0	0.017	2.241	B-MCC HW2-GRIT PUMP 2	
D-MCC HW2-PRI. SLUDGE 1	0.48	Generator 2	0.335533	0.8	Level 0	0.544	0.518	B-MCC HW2-PRI. SLUDGE 1	
D-MCC HW2-PRI. SLUDGE 3	0.48	Generator 2	0.335533	0.8	Level 0	0.544	0.518	B-MCC HW2-PRI. SLUDGE 3	
D-MCC HW2-RSP 6	0.48	Normal	0.099132	0.4	Level 0	0.019	2.621	B-MCC HW2-RSP 6	
D-MCC HW2-WAS PUMP 3	0.48	Generator 1	0.037992	0.3	Level 0	0.035	0.611	B-MCC HW2-WAS PUMP 3	15%
D-MCC HW2-WAS PUMP 4	0.48	Generator 1	0.383813	0.8	Level 0	0.362	0.598	B-MCC HW2-WAS PUMP 4	15%
D-MCCB4-SUBM PUMP START	0.48	Normal	0.052456	0.3	Level 0	0.018	1.57	B-MCCB4-SUBM PUMP START	
DAF THICKENER 2 AFD	0.48	Normal	0.322744	0.8	Level 0	0.017	5.664	B-MCC B1-DAF THICK 2	
DAVIS SCRUBBER	0.48	Normal	0.349881	0.8	Level 0	0.017	5.98	B-MCC HW2-DAVIS SCRUBBER	
DEEP WELL PUMP 1 VFD	0.48	Generator 2	10.31	4.4	Level 3	0.443	6.389	B-SWGR-SUB1	
DEEP WELL PUMP 2 VFD	0.48	Gen 1 & 2	11.72	4.7	Level 3	0.425	7.487	B-SWGR-SUB2	
DEEP WELL PUMP 3 VFD	0.48	Generator 2	11.22	4.6	Level 3	0.447	6.772	B-SWGR-SUB2	
DEEP WELL PUMP 4 VFD	0.48	Normal	1.69	1.8	Level 1	0.05	9.48	B-SUB 11-SWBD 11	
DEEP WELL PUMP 5 VFD	0.48	Normal	1.86	1.9	Level 1	0.05	10.356	B-SWBD12-MAIN	
DEEP WELL PUMP 6 VFD	0.48	Normal	1.89	1.9	Level 1	0.05	10.534	B-SWBD12-MAIN	
DEGRITTER CP	0.48	Normal	0.118752	0.4	Level 0	0.017	2.343	B-MCC HW2-DEGRITTER CP	
DP1 MAIN LS	0.48	Normal	0.338119	0.8	Level 0	0.016	6.152	B-MCC E1-PNL. DP #1	
DP2 MAIN LS	0.48	Normal	0.343813	0.8	Level 0	0.016	6.209	B-MCC E1-PNL. DP #2	
DP4 MAIN LS	0.48	Normal	0.346003	0.8	Level 0	0.016	6.178	B-MCC E2-PNL. DP #4	
EFF. FILTER PS CNTRL	0.48	Normal	0.33815	0.8	Level 0	0.016	6.048	B-MCC E2-EFF. FILTER PS	
ELECTRIC ROLL-UP DOOR	0.48	Normal	0.149438	0.5	Level 0	0.017	2.778	MCC 1-MAIN	
EQ TANK RETURN	0.48	Normal	0.110117	0.5	Level 0	0.017	2.095	B-MCC B4-EQ TANK RETURN	
FPL PRIMARY	23	Normal	36.34	16.5	Level 4	2	1.28	F-FPL SERVICE 1	
FPL SERVICE	4.16	Normal	81.19	12.3	> Level 4	2	18.642		
GEN BUS	4.16	Gen 1 & 2	9.6	4.2	Level 3	2	1.622	B-GEN 2	
GEN MASTER LS	4.16	Gen 1 & 2	4.54	11.8	Level 2	2	1.619	B-GEN 2	
HOIST	0.48	Normal	0.294439	0.7	Level 0	0.017	5.203	B-MCC B2-HOIST	
LIGHTING PANEL	0.208	Gen 1 & 2	4	3.1	Level 1		1.194		
LTG. PNL	0.208	Gen 1 & 2	4	3.1	Level 1		1.35		
MAIN GATE CP	0.48	Generator 1	0.07006	0.3	Level 0	0.043	0.612	B-MCC HW1-MAIN GATE	15%
MCC 1	0.48	Normal	0.262877	0.6	Level 0	0.017	5.013	MCC 1-MAIN	
MCC B1	0.48	Normal	0.749702	1.1	Level 0	0.025	9.061	MCC B1-MAIN	
MCC B2	0.48	Gen 1 & 2	1.47	1.7	Level 1	0.06	7.547	B-SUB5-MAIN	
MCC B3	0.48	Generator 2	1.51	1.7	Level 1	0.06	7.739	B-SUB6-MAIN	
MCC B4	0.48	Gen 1 & 2	1.46	1.7	Level 1	0.06	7.521	B-SUB5-MAIN	
MCC D1	0.48	Normal	1.02	1.4	Level 0	0.06	5.382	B-SUB8-MAIN	15%
MCC D2	0.48	Normal	0.535022	0.9	Level 0	0.027	6.17	B-SUB7-MCC D2	
MCC D4 LS	0.48	Gen 1 & 2	8.66	4	Level 3	0.377	6.374	B-SWGR-SUB7	
MCC D5 LS	0.48	Gen 1 & 2	8.75	4	Level 3	0.382	6.375	B-SWGR-SUB8	
MCC DW1	0.48	Normal	0.665803	1	Level 0	0.025	8.129	B-SUB8-MCC DW1	
MCC DW2	0.48	Normal	0.646237	1	Level 0	0.025	7.908	B-SUB7-MCC DW2	
MCC E1	0.48	Gen 1 & 2	1.43	1.7	Level 1	0.06	7.351	B-SUB1-MAIN	
MCC E2	0.48	Generator 1	0.714327	1.1	Level 0	0.04	5.657	B-SUB2-MCC E2	15%
MCC HW 1	0.48	Normal	1.63	1.8	Level 1	0.06	8.307	B-SUB3-MAIN	
MCC HW 2	0.48	Normal	1.58	1.8	Level 1	0.06	8.085	B-SUB4-MAIN	
MCC-D4	0.48	Normal	2.03	2.1	Level 1	0.08	7.241	B-MCC D4 MAIN	
MCC-D5	0.48	Normal	2.03	2.1	Level 1	0.08	7.243	B-MCC D5 MAIN	
MCC1 LS	0.48	Normal	0.268109	0.6	Level 0	0.017	5.013	B-SUB6-MCC 1	
MCCB1 LS	0.48	Gen 1 & 2	1.64	1.8	Level 1	0.06	8.341	B-SUB6-MAIN	
MCCD1 LS	0.48	Gen 1 & 2	1.13	1.4	Level 0	0.06	5.919	B-SUB8-MAIN	
MCCD2 LS	0.48	Normal	0.535022	0.9	Level 0	0.027	6.17	B-SUB7-MCC D2	
MECH SCREEN CP	0.48	Normal	0.101037	0.3	Level 0	0.017	2.07	B-MCC HW1-MECH SCREEN	
MOV RATE OF FLOW	0.48	Generator 1	0.053381	0.3	Level 0	0.028	0.674	B-MCC E2-MOV RATE	15%
MTS-AC1-LOAD	0.48	Normal	0.083446	0.4	Level 0	0.018	1.504	B-MCC D4-MTS	
MTS-MCC D4 LINE	0.48	Normal	0.083446	0.4	Level 0	0.018	1.504	B-MCC D4-MTS	
MTS-MCC D5-LINE	0.48	Normal	0.082574	0.4	Level 0	0.018	1.49	B-MCC D5-MTS	
NEW MAINT. BLDG	0.48	Normal	0.30304	0.8	Level 0	0.017	5.344	B-SUB8-NEW MAINT. BLDG	
OLD MAINTENANCE BLDG	0.48	Normal	0.204121	0.6	Level 0	0.017	3.619	B-MCC DW2-OLD MAINT.	
PLANT DRAIN #3	0.48	Normal	0.481073	0.9	Level 0	0.016	8.525	B-MCC DW1-PLANT DRAIN	
PLANT DRAIN PS CTL PNL	0.48	Normal	0.29921	0.7	Level 0	0.016	5.495	B-MCC-E2-PLANT DRAIN PS	
PMS-7A LS	4.16	Normal	2.04	2	Level 1	0.099	8.88	B-SWGR-SUB7	
PMS-8A LS	4.16	Normal	2.05	2	Level 1	0.099	8.911	B-SWGR-SUB8	
PNL CP	0.208	Gen 1 & 2	4	3.1	Level 1		1.014		
PNL DP #1	0.48	Normal	0.293245	0.6	Level 0	0.016	5.771	B-MCC E1-PNL. DP #1	
PNL DP #2	0.48	Normal	0.301539	0.6	Level 0	0.016	5.822	B-MCC E1-PNL. DP #2	
PNL DP #4	0.48	Normal	0.300028	0.6	Level 0	0.016	5.794	B-MCC E2-PNL. DP #4	

ID	kV (kV)	Configuration	Total Energy (cal/cm²)	AFB (ft)	Energy Levels	Final FCT (sec)	Ia at FCT (kA)	Source PD ID	% Ia Variation
PNL L1	0.208	Gen 1 & 2	4	3.1	Level 1		1.636		
PNL LB1	0.208	Gen 1 & 2	4	3.1	Level 1		1.341		
PNL LC1/LC2	0.208	Gen 1 & 2	4	3.1	Level 1		1.303		
PNL LD	0.208	Gen 1 & 2	4	2.7	Level 1		1.226		
PNL LD 2	0.208	Gen 1 & 2	4	2.7	Level 1		1.287		
PNL LDW	0.208	Gen 1 & 2	4	2.7	Level 1		1.289		
PNL LHW	0.208	Gen 1 & 2	4	3.1	Level 1		1.366		
PNL LP1	0.208	Gen 1 & 2	4	3.1	Level 1		0.738		
PNL LP2	0.208	Gen 1 & 2	4	3.1	Level 1		0.748		
PNL P3	0.48	Normal	0.393365	0.8	Level 0	0.016	7.404	B-PNL P3	
PNL PC/TC-2	0.208	Gen 1 & 2	4	3.1	Level 1		1.342		
PNL PC/TC-3	0.208	Gen 1 & 2	4	3.1	Level 1		1.294		
PNL PC/TC-4	0.208	Gen 1 & 2	4	2.7	Level 1		1.245		
PNL XLC	0.208	Gen 1 & 2	4	2.7	Level 1		0.569		
PNL XLC (2)	0.208	Gen 1 & 2	4	2.7	Level 1		0.569		
PNL-P1	0.48	Normal	0.182239	0.5	Level 0	0.016	3.717	B-SUB2-PNL P1	
PNL-P4	0.48	Normal	0.279707	0.6	Level 0	0.017	5.197	B-MCC E2-PNL P4	
POLYMER FEED 5, 6	0.48	Normal	0.115504	0.5	Level 0	0.017	2.145	B-MCC DW2-POLYMER FEED5/6	
POLYMER FEED CP	0.48	Normal	0.106161	0.4	Level 0	0.017	1.958	B-MCC DW2-POLYMER FEED	
POLYMER MIX CP	0.48	Normal	0.106702	0.4	Level 0	0.017	1.967	B-MCC DW1-POLYMER MIX	
RAS 1 VFD	0.48	Normal	0.328026	0.8	Level 0	0.016	5.895	B-MCC E1-PNL DP #2	
RAS 2 VFD	0.48	Normal	0.328217	0.8	Level 0	0.016	5.884	B-MCC E2-PNL DP #4	
RAS 3 VFD	0.48	Normal	0.328026	0.8	Level 0	0.016	5.895	B-MCC E1-PNL DP #2	
RAS 7 VFD	0.48	Normal	0.319808	0.8	Level 0	0.016	5.844	B-MCC E1-PNL DP #1	
RAS 8 VFD	0.48	Normal	0.319808	0.8	Level 0	0.016	5.844	B-MCC E1-PNL DP #1	
REUSE LIFT STATION PUMP	0.48	Normal	0.072122	0.4	Level 0	0.017	1.416	B-MCC E1-REUSE LIFT PUMP	
ROOF A/C #1	0.48	Normal	0.06861	0.4	Level 0	0.018	1.231	B-MCC E1-ROOF A/C #1	
S-DEEP WELL 2 LOAD	0.48	Generator 2	11.22	4.6	Level 3	0.447	6.772	B-SWGR-SUB2	
S-DEEP WELL 5 LOAD	0.48	Normal	1.91	1.9	Level 1	0.05	10.657	B-SWBD12-MAIN	
S-MCC D1-PNL LD	0.48	Normal	0.258058	0.7	Level 0	0.017	4.606	B-MCC D1-PNL LD	
S-MCC D2-PNL LD	0.48	Normal	0.254006	0.7	Level 0	0.017	4.539	B-MCC D2-PNL LD	
S-MCC DW1-PNL LDW	0.48	Normal	0.337048	0.8	Level 0	0.017	5.897	B-MCC DW1-PNL LDW	
S-MCC DW2-PNL LDW	0.48	Normal	0.331781	0.8	Level 0	0.017	5.811	B-MCC DW2-PNL LDW	
S-MCC HW1-PNL LHW	0.48	Normal	0.227811	0.6	Level 0	0.017	6.687	B-MCC HW1-PNL LHW	
S-MCC HW2-PNL LHW	0.48	Normal	0.237664	0.7	Level 0	0.017	6.954	B-MCC HW2-PNL LHW	
S-MCCB2-PNL LB1	0.48	Normal	0.21713	0.6	Level 0	0.017	6.396	B-MCC B2-PNL LB1	
S-MCCB2-PNL P3	0.48	Normal	0.260428	0.7	Level 0	0.017	7.427	B-MCC B2-PNL P3	
S-MCCB3-PNL LB1	0.48	Normal	0.226124	0.6	Level 0	0.017	6.641	B-MCC B3-PNL LB1	
S-MCCB3-PNL P3	0.48	Normal	0.275479	0.7	Level 0	0.017	7.826	B-MCC B3-PNL P3	
S-MCCE1-PNL P4	0.48	Normal	0.162234	0.5	Level 0	0.017	4.778	B-MCC E1-PNL P4	
S-MCCE2-PNL P4	0.48	Normal	0.182775	0.6	Level 0	0.017	5.339	B-MCC E2-PNL P4	
S-PNL L1-LOAD	0.48	Normal	0.229017	0.6	Level 0	0.016	6.991	B-SUB2-PNL L1	
S-PNL LB1-LOAD	0.48	Normal	0.21713	0.6	Level 0	0.017	6.396	B-MCC B2-PNL LB1	
S-PNL LD LOAD	0.48	Normal	0.254006	0.7	Level 0	0.017	4.539	B-MCC D2-PNL LD	
S-PNL LDW LOAD	0.48	Normal	0.331781	0.8	Level 0	0.017	5.811	B-MCC DW2-PNL LDW	
S-PNL LHW LOAD	0.48	Normal	0.237664	0.7	Level 0	0.017	6.954	B-MCC HW2-PNL LHW	
S-PNL P1-LOAD	0.48	Normal	0.229017	0.6	Level 0	0.016	6.991	B-SUB2-PNL P1	
S-PNL P3-LOAD	0.48	Normal	0.260428	0.7	Level 0	0.017	7.427	B-MCC B2-PNL P3	
S-PNL P4-LOAD	0.48	Normal	0.182775	0.6	Level 0	0.017	5.339	B-MCC E2-PNL P4	
S-SUB1-PNL L1	0.48	Normal	0.253275	0.7	Level 0	0.016	7.673	B-SUB1-PNL L1	
S-SUB1-PNL P1	0.48	Normal	0.253275	0.7	Level 0	0.016	7.673	B-SUB1-PNL P1	
S-SUB2-PNL L1	0.48	Normal	0.229017	0.6	Level 0	0.016	6.991	B-SUB2-PNL L1	
S-SUB2-PNL P1	0.48	Normal	0.229017	0.6	Level 0	0.016	6.991	B-SUB2-PNL P1	
S-SUB9-DEEP WELL 2	0.48	Generator 2	9.33	4.2	Level 3	0.487	5.37	B-SWGR-SUB1	15%
S-SUB10-DEEP WELL 2	0.48	Generator 2	11.22	4.6	Level 3	0.447	6.772	B-SWGR-SUB2	
S-SWBD11-DEEP WELL 5	0.48	Normal	1.7	1.8	Level 1	0.05	9.53	B-SUB 11-SWBD 11	
S-SWBD12-DEEP WELL 5	0.48	Normal	1.91	1.9	Level 1	0.05	10.657	B-SWBD12-MAIN	
SCUM EJECTOR CP	0.48	Normal	0.051893	0.2	Level 0	0.022	0.865	B-MCC HW1-SCUM EJECTOR	
SEC CLARIFIERS 3, 4	0.48	Generator 1	0.021778	0.2	Level 0	0.027	0.685	B-MCC HW2-SEC CLARIFIER	
SLUDGE THICKENER DRIVE	0.48	Normal	0.158975	0.5	Level 0	0.017	2.894	B-MCC B2-SLUDGE THICKENER	
SLUICE GATE 2	0.48	Generator 1	0.263006	0.7	Level 0	0.378	0.591	B-MCC E2-SLUICE GATE 2	
SLUICE GATE #4	0.48	Generator 1	0.263211	0.7	Level 0	0.379	0.591	B-MCC E1-SLUICE GATE #4	
SODIUM BICARBONATE CP	0.48	Normal	0.309522	0.8	Level 0	0.017	5.335	B-MCC D1-SODIUM BICARB CP	
SUB 1 BUS A	0.48	Normal	1.06	1.8	Level 0	0.06	8.525	B-SUB1-MAIN	
SUB1 FEED	4.16	Normal	4.18	2.8	Level 2	0.099	17.39	B-SWGR-SUB1	
SUB1 LS	0.48	Gen 1 & 2	5.73	5.8	Level 2	0.437	6.23	B-SWGR-SUB1	
SUB1/SUB9	4.16	Normal	4.48	2.9	Level 2	0.099	18.586	B-SWGR-SUB1	
SUB 2 BUS B	0.48	Normal	1.03	1.8	Level 0	0.06	8.28	B-SUB2-MAIN	
SUB2 FEED	4.16	Normal	4.24	2.8	Level 2	0.099	17.636	B-SWGR-SUB2	
SUB2 LS	0.48	Gen 1 & 2	5.77	5.8	Level 2	0.439	6.276	B-SWGR-SUB2	
SUB2/SUB10	4.16	Normal	4.48	2.9	Level 2	0.099	18.583	B-SWGR-SUB2	
SUB 3 BUS A	0.48	Normal	1.03	1.8	Level 0	0.06	8.26	B-SUB3-MAIN	
SUB3 FEED	4.16	Normal	3.41	2.5	Level 1	0.099	14.363	B-SWGR-SUB3	
SUB3 MAIN LS	0.48	Normal	5	5.3	Level 2	0.359	6.772	B-SWGR-SUB3	15%
SUB 4 BUS B	0.48	Normal	1.02	1.8	Level 0	0.06	8.208	B-SUB4-MAIN	
SUB4 FEED	4.16	Normal	3.41	2.5	Level 1	0.099	14.398	B-SWGR-SUB4	
SUB4 MAIN LS	0.48	Normal	5.02	5.3	Level 2	0.36	6.779	B-SWGR-SUB4	15%
SUB 5 BUS A	0.48	Normal	1.02	1.8	Level 0	0.06	8.186	B-SUB5-MAIN	
SUB5 FEED	4.16	Normal	2.45	2.1	Level 1	0.099	10.53	B-SWGR-SUB3	
SUB5 MAIN LS	0.48	Gen 1 & 2	8.81	4.1	Level 3	0.358	6.797	B-SWGR-SUB3	
SUB 6 BUS B	0.48	Normal	1.14	1.9	Level 0	0.06	9.049	B-SUB6-MAIN	
SUB6 FEED	4.16	Normal	2.47	2.2	Level 1	0.099	10.64	B-SWGR-SUB4	
SUB6 MAIN LS	0.48	Gen 1 & 2	9.73	4.3	Level 3	0.363	7.265	B-SWGR-SUB4	
SUB 7 BUS A	0.48	Normal	0.979974	1.7	Level 0	0.06	7.899	B-SUB7-MAIN	
SUB7 FEED	4.16	Normal	2.11	2	Level 1	0.099	9.137	B-SWGR-SUB7	
SUB7 MAIN LS	0.48	Normal	4.84	5.2	Level 2	0.366	6.451	B-SWGR-SUB7	15%
SUB7/SUB11	4.16	Normal	4.48	2.9	Level 2	0.099	18.583	B-SWGR-SUB7	

ID	kV (kV)	Configuration	Total Energy (cal/cm²)	AFB (ft)	Energy Levels	Final FCT (sec)	Ia at FCT (kA)	Source PD ID	% Ia Variation
SUB 8 BUS B	0.48	Normal	1.01	1.8	Level 0	0.06	8.106	B-SUB8-MAIN	
SUB8 FEED	4.16	Normal	2.11	2	Level 1	0.099	9.17	B-SWGR-SUB8	
SUB8 MAIN LS	0.48	Normal	4.86	5.2	Level 2	0.367	6.418	B-SWGR-SUB8	15%
SUB8/SUB12	4.16	Normal	4.48	2.9	Level 2	0.099	18.586	B-SWGR-SUB8	
SUB 9 BUS A	0.48	Generator 2	5.73	5.8	Level 2	0.467	5.757	B-SWGR-SUB1	
SUB9 FEED	4.16	Normal	4.12	2.8	Level 2	0.099	17.158	B-SWGR-SUB1	
SUB9 LS	0.48	Generator 2	10.43	4.4	Level 3	0.437	6.523	B-SWGR-SUB1	
SUB 10 BUS B	0.48	Normal	6.68	6.4	Level 2	0.424	7.474	B-SWGR-SUB2	15%
SUB10 FEED	4.16	Normal	4.16	2.8	Level 2	0.099	17.298	B-SWGR-SUB2	
SUB10 LS	0.48	Generator 2	11.31	4.6	Level 3	0.443	6.873	B-SWGR-SUB2	
SUB11 LS	0.48	Normal	11.49	4.6	Level 3	0.324	9.767	B-SWGR-SUB7	
SUB12 LS	0.48	Normal	12.18	4.8	Level 3	0.325	10.154	B-SWGR-SUB8	
SUBNATANT PUMP	0.48	Normal	0.385285	0.8	Level 0	0.017	6.673	B-MCC B1-SUBNATANT	
SUPERANANT PS CP	0.48	Normal	0.237446	0.7	Level 0	0.016	4.437	B-MCC D1-SUPERANANT	
SWBD 11 BUS A	0.48	Normal	0.88727	1.6	Level 0	0.05	8.528	B-SUB 11-SWBD 11	
SWBD11 LS	0.48	Normal	1.73	1.8	Level 1	0.05	9.722	B-SUB 11-SWBD 11	
SWBD 12 BUS B	0.48	Normal	0.99109	1.8	Level 0	0.05	9.448	B-SWBD12-MAIN	
SWBD12 LS	0.48	Normal	1.95	1.9	Level 1	0.05	10.847	B-SUB 12-SWBD 12	
SWGR BUS A	4.16	Normal	8.63	22.8	Level 3	0.423	16.998	B-SWGR-MAIN 2	
SWGR BUS B	4.16	Normal	8.61	22.7	Level 3	0.422	16.997	B-SWGR-MAIN 1	
SWGR MAIN 1 LS	4.16	Normal	38.4	105.7	Level 4	2	18.583		
SWGR MAIN 2 LS	4.16	Normal	38.4	105.7	Level 4	2	18.586		
SWITCH 11	4.16	Normal	4.09	2.8	Level 2	0.099	17.035	B-SWGR-SUB7	
SWITCH 12	4.16	Normal	4.13	2.8	Level 2	0.099	17.18	B-SWGR-SUB8	
T-AC-1	0.48	Generator 1	0.074474	0.4	Level 0	0.028	0.89	B-MCC D4-MTS	15%
T-BLOWER AB1	4.16	Gen 1 & 2	2.12	2	Level 1	0.271	3.093	B-SWGR-SUB4	
T-BLOWER AB2	4.16	Gen 1 & 2	2.13	2	Level 1	0.271	3.101	B-SWGR-SUB4	
T-BLOWER AB3	4.16	Gen 1 & 2	2.14	2	Level 1	0.271	3.11	B-SWGR-SUB4	
T-BLOWER AB4	4.16	Generator 2	1.54	1.7	Level 1	0.279	2.165	B-SWGR-SUB3	
T-BLOWER AB5	4.16	Generator 2	1.55	1.7	Level 1	0.279	2.168	B-SWGR-SUB3	
T-DEEP WELL PUMP 1	0.48	Normal	10.1	4.4	Level 3	0.453	6.34	B-SWGR-SUB1	
T-DEEP WELL PUMP 2	0.48	Normal	10.44	4.4	Level 3	0.47	6.292	B-SWGR-SUB2	
T-DEEP WELL PUMP 3	0.48	Normal	10.55	4.4	Level 3	0.464	6.438	B-SWGR-SUB2	
T-DEEP WELL PUMP 4	0.48	Normal	1.17	1.5	Level 0	0.05	6.76	B-SUB 11-SWBD 11	
T-DEEP WELL PUMP 5	0.48	Normal	1.23	1.5	Level 1	0.05	7.058	B-SWBD12-MAIN	
T-DEEP WELL PUMP 6	0.48	Normal	1.23	1.5	Level 1	0.05	7.082	B-SWBD12-MAIN	
T-DP1-WAS PUMP 5	0.48	Normal	0.061958	0.3	Level 0	0.017	1.238	B-DP1-WAS 5(2)	
T-DP1-WAS PUMP 6	0.48	Normal	0.061958	0.3	Level 0	0.017	1.238	B-DP1-WAS 6(2)	
T-DP2-WAS PUMP 1	0.48	Normal	0.120036	0.5	Level 0	0.017	2.281	B-DP2-WAS 1(2)	
T-DP2-WAS PUMP 2	0.48	Normal	0.120036	0.5	Level 0	0.017	2.281	B-DP2-WAS 2(2)	
T-GEN 1	4.16	Gen 1 & 2	9.59	4.2	Level 3	2	6.862		
T-GEN 2	4.16	Gen 1 & 2	9.58	4.2	Level 3	2	6.857		
T-MCC D4-BLOWER 1	0.48	Normal	0.298819	0.7	Level 0	0.02	4.464	B-MCC D4-BLOWER 1	
T-MCC D4-BLOWER 3	0.48	Normal	0.327705	0.8	Level 0	0.02	4.862	B-MCC D4-BLOWER 3	
T-MCC D4-PMP 1	0.48	Normal	0.195973	0.6	Level 0	0.017	3.57	B-MCC D4-PMP 1	
T-MCC D4-PMP 3	0.48	Normal	0.222558	0.6	Level 0	0.017	4.016	B-MCC D4-PMP 3	
T-MCC D5-BLOWER 2	0.48	Normal	0.269617	0.7	Level 0	0.02	4.059	B-MCC D5-BLOWER 2	
T-MCC D5-BLOWER 4	0.48	Normal	0.327401	0.8	Level 0	0.02	4.858	B-MCC D5-BLOWER 4	
T-MCC D5-PMP 2	0.48	Normal	0.175021	0.6	Level 0	0.017	3.216	B-MCC D5-PMP 2	
T-MCC D5-PMP 4	0.48	Normal	0.222412	0.6	Level 0	0.017	4.014	B-MCC D5-PMP 4	
T-MCCD1-PNL LD	0.208	Gen 1 & 2	4	2.7	Level 1		1.236		
T-MCCDW1-PNL LDW	0.208	Gen 1 & 2	4	2.7	Level 1		1.3		
T-MCCHW1-PNL LHW 2	0.208	Gen 1 & 2	4	2.7	Level 1		1.391		
T-SUB2-PNL CP	0.208	Gen 1 & 2	4	2.7	Level 1		1.022		
T-SUB11-SWBD11	0.48	Normal	1.89	1.9	Level 1	0.05	10.527	B-SUB 11-SWBD 11	
T-SUB12-SWBD12	0.48	Normal	2.09	2	Level 1	0.05	11.561	B-SUB 12-SWBD 12	
T-TR-DP1-XLC	0.48	Normal	0.278821	0.7	Level 0	0.016	5.147	B-MCC E1-PNL DP #1	
T-TR-DP4-XLC	0.48	Normal	0.287901	0.7	Level 0	0.016	5.212	B-MCC E2-PNL DP #4	
T-TR-MCC 1-PNL XFMR	0.48	Normal	0.11391	0.5	Level 0	0.008	4.27	B-MCC 1-LP1	
T-TR-MCC 1-PNL XFMR (2)	0.208	Gen 1 & 2	4	2.7	Level 1		0.73		
T-TR-MCC B1-PNL XFMR	0.48	Normal	0.468092	0.9	Level 0	0.017	7.99	B-MCC B1-PNL	
T-TR-MCC B1-PNL XFMR2	0.208	Gen 1 & 2	4	2.7	Level 1		1.292		
T-TR-MCC B2-PNL (2)	0.208	Gen 1 & 2	4	2.7	Level 1		1.387		
T-TR-MCC B2-PNL LB1 (2)	0.208	Gen 1 & 2	4	2.7	Level 1		1.377		
T-TR-MCC D1-PNL LD 2	0.48	Normal	0.276754	0.7	Level 0	0.017	4.914	B-MCC D1-PNL LD 2	
T-TR-MCC D1-PNL LD2 (2)	0.208	Gen 1 & 2	4	2.7	Level 1		1.309		
T-TR-MCCB2-PNL LB1	0.48	Normal	0.344051	0.8	Level 0	0.017	6.01	B-MCC B2-PNL LB1	
T-TR-MCCB2-PNL XFMR	0.48	Normal	0.386243	0.9	Level 0	0.016	6.804	B-PNL P3	
T-TR-MCCB4-PNL LP2	0.48	Normal	0.433566	0.9	Level 0	0.017	7.443	B-MCC B4-PNL LP2	
T-TR-MCCB4-PNL LP2 (2)	0.208	Gen 1 & 2	4	2.7	Level 1		0.745		
T-TR-MCCD1-PNL LD	0.48	Normal	0.237781	0.7	Level 0	0.017	4.27	B-MCC D2-PNL LD	
T-TR-MCCDW1-PNL LDW	0.48	Normal	0.304649	0.8	Level 0	0.017	5.37	B-MCC DW2-PNL LDW	
T-TR-MCCHW1-PNL LHW	0.48	Normal	0.419688	0.9	Level 0	0.017	7.222	B-MCC HW2-PNL LHW	
T-TR-SUB1/2-PNL L1 XFMR	0.48	Normal	0.4238	0.9	Level 0	0.016	7.582	B-SUB2-PNL L1	
T-TR-SUB1/2-PNL L1 XFMR 2	0.208	Gen 1 & 2	4	2.7	Level 1		2.367		
T-TR-SUB2-PNL CP XFMR	0.48	Normal	0.094888	0.4	Level 0	0.017	1.757	B-SUB2-PNL CP	
T-TR-SUB2-PNL CP XFMR 2	0.208	Gen 1 & 2	4	2.7	Level 1		1.036		
T-TR-T7A-PRI	4.16	Normal	0.084347	0.4	Level 0	0.004	8.603	F-TR-T7A-P	
T-TR-T7A-SEC	0.48	Generator 2	8.41	4	Level 3	0.394	5.884	B-SWGR-SUB7	
T-TR-T8A-PRI	4.16	Normal	0.084656	0.4	Level 0	0.004	8.633	F-TR-T8A-P	
T-TR-T8A-SEC	0.48	Generator 2	8.56	4	Level 3	0.401	5.885	B-SWGR-SUB8	
THICK WAS 3 AFD	0.48	Normal	0.555798	1	Level 0	0.017	9.365	B-MCC B1-THICK WAS 3	
THICK WAS 4 AFD	0.48	Normal	0.555798	1	Level 0	0.017	9.365	B-MCC B1-THICK WAS 4	
VALVE OPERATOR	0.48	Normal	0.214199	0.6	Level 0	0.017	3.877	B-MCC B3-VALVE OP	
WATER HEATER	0.48	Normal	0.426835	0.9	Level 0	0.017	7.198	B-MCC DW1-WATER HEATER	

**APPENDIX D2 – ARC FLASH STUDY  
(PROPOSED SETTINGS)**

ID	kV (kV)	Configuration	Total Energy (cal/cm²)	AFB (ft)	Energy Levels	Final FCT (sec)	Ia at FCT (kA)	Source PD ID	% Ia Variation
54" METER VAULT VALVE	0.48	Generator 1	0.054436	0.3	Level 0	0.026	0.723	B-MCC E1-54" METER VAULT	15%
A/C ROOF UNIT #2	0.48	Normal	0.222541	0.6	Level 0	0.017	4.016	B-MCC E2-A/C ROOF UNIT 2	
ABFV-1	0.48	Normal	0.09184	0.4	Level 0	0.008	3.499	B-MCC 1-ABFV-1	
ABFV-2	0.48	Normal	0.080594	0.4	Level 0	0.008	3.1	B-MCC 1-ABFV-2	
ABFV-3	0.48	Normal	0.071587	0.4	Level 0	0.008	2.778	B-MCC 1-ABFV-3	
ABFV-4	0.48	Normal	0.064279	0.3	Level 0	0.008	2.515	B-MCC 1-ABFV-4	
ABFV-5	0.48	Normal	0.058265	0.3	Level 0	0.008	2.297	B-MCC 1-ABFV-5	
ABW #1 EFF. WEIR GATE	0.48	Generator 1	0.054436	0.3	Level 0	0.026	0.723	B-MCC E1-EFF. WEIR GATE	15%
ABW #1 FESTON SYSTEM	0.48	Generator 1	0.168206	0.6	Level 0	0.035	1.558	B-MCC E1 ABW #1 FESTON	15%
ABW #1 INF. WEIR GATE	0.48	Generator 1	0.053521	0.3	Level 0	0.025	0.75	B-MCC E1-INF. WEIR GATE	15%
ABW #1 SLUICE GATE #1	0.48	Generator 1	0.263006	0.7	Level 0	0.378	0.591	B-MCC E2-ABW #1 SLUICE 1	
ABW #3 FESTON SYSTEM	0.48	Normal	0.093136	0.4	Level 0	0.017	1.794	B-MCC E2 ABW #3 FESTON	
ABW #3,4,5 FESTON SYSTEM	0.48	Generator 1	0.066773	0.4	Level 0	0.023	0.97	B-MCC E2-ABW 3,4,5 FESTON	15%
ABW 3,4,5 FLOCCULATOR	0.48	Normal	0.010712	0.1	Level 0	0.016	0.569	B-MCC E2-ABW 3,4,5 FLOCC	
ABW #3,4,6 FESTON SYSTEM	0.48	Normal	0.06765	0.4	Level 0	0.019	1.189	B-MCC E1-ABW 3,4,6 FESTON	
ABW #3,4,6 SLUICE GATE	0.48	Generator 1	0.067508	0.4	Level 0	0.035	0.675	B-MCC-E1 ABW 3,5,6 SLUICE	15%
ABW #5 SLUICE GATE	0.48	Generator 1	0.061521	0.3	Level 0	0.029	0.723	B-MCC-E1 ABW #5 SLUICE	15%
ABW #6 FESTON SYSTEM	0.48	Normal	0.093259	0.4	Level 0	0.017	1.796	B-MCC-E1 ABW #6 FESTON	
ABW #6 SLUICE GATE	0.48	Generator 1	0.056154	0.3	Level 0	0.028	0.698	B-MCC-E1 ABW #6 SLUICE	15%
ABW 6,7 FLASH MIXER #3	0.48	Generator 1	0.056216	0.3	Level 0	0.031	0.632	B-MCC E2-ABW 6,7FLASH MIX	15%
ABW #7 FESTON SYSTEM	0.48	Normal	0.083932	0.4	Level 0	0.017	1.63	B-MCC E2-ABW #7 FESTON	
ABW FILTER #2	0.48	Normal	0.08985	0.4	Level 0	0.017	1.736	B-MCC E2-ABW FILTER 2	
ABW SLUICE GATE	0.48	Generator 2	0.410103	0.9	Level 0	0.616	0.559	B-MCC E2-ABW SLUICE GATE	
ACU-1	0.48	Normal	0.128925	0.5	Level 0	0.008	4.788	B-MCC 1-ACU 1	
AFD-MCC D1-THICKENER	0.48	Normal	0.279095	0.7	Level 0	0.017	4.952	B-MCC D1-THICKENER	
AIR COMPRESSOR	0.48	Normal	0.380111	0.8	Level 0	0.017	6.594	B-MCC B1-AIR COMPRESSOR	
AIR COMPRESSOR 2	0.48	Normal	0.361854	0.8	Level 0	0.017	6.297	B-MCC B1-AIR COMPRESSOR 2	
BASIN 1 ADFV 13	0.48	Normal	0.120217	0.5	Level 0	0.017	2.272	B-MCC B4-ADVF 13	
BASIN 2 ADFV 14	0.48	Normal	0.097737	0.4	Level 0	0.017	1.876	B-MCC B4-ADVF 14	
BASIN 3 ADFV 15	0.48	Normal	0.077781	0.4	Level 0	0.017	1.519	B-MCC B4-ADVF 15	
BASIN 4 ADFV 16	0.48	Normal	0.065662	0.4	Level 0	0.017	1.28	B-MCC B4-ADVF 16	
BELT FILTER PRESS 1	0.48	Normal	0.256049	0.7	Level 0	0.017	4.572	B-MCC DW1-BFP 1	
BELT FILTER PRESS 2	0.48	Normal	0.253415	0.7	Level 0	0.017	4.529	B-MCC DW2-BFP 2	
BELT FILTER PRESS 3	0.48	Normal	0.293294	0.7	Level 0	0.017	5.184	B-MCC DW1-BFP 3	
BELT FILTER PRESS 4	0.48	Normal	0.297171	0.7	Level 0	0.017	5.248	B-MCC DW1-BFP 4	
BELT FILTER PRESS 5	0.48	Normal	0.350897	0.8	Level 0	0.017	6.12	B-MCC DW1-BFP 5	
BELT FILTER PRESS 6	0.48	Normal	0.350765	0.8	Level 0	0.017	6.118	B-MCC DW1-BFP 6	
BLOWER #6 INLET VALVE	0.48	Normal	0.299507	0.7	Level 0	0.017	5.286	B-MCC 1-BLOWER #6 INLET	
BLOWER A LS	4.16	Generator 2	3.89	5	Level 1	1.852	0.615	B-SWGR-SUB3	
BLOWER B LS	4.16	Generator 2	4.06	5.3	Level 2	1.978	0.614	B-SWGR-SUB4	
BLOWER BUS A	4.16	Generator 2	3.89	5	Level 1	1.852	0.615	B-SWGR-SUB3	
BLOWER BUS B	4.16	Generator 2	4.06	5.3	Level 2	1.978	0.614	B-SWGR-SUB4	
CLARIFIER 1 CP	0.48	Normal	0.065317	0.3	Level 0	0.017	1.294	B-DP2-CLARIFIER1	
CLARIFIER 2 CP	0.48	Normal	0.065652	0.4	Level 0	0.017	1.3	B-DP4-CLARIFIER	
CLARIFIER 5 CP	0.48	Normal	0.065218	0.3	Level 0	0.017	1.292	B-DP1-CLARIFIER	
CONVEYOR CP	0.48	Normal	0.198997	0.6	Level 0	0.017	3.622	B-MCC DW2-CONVEYOR CP	
D-DP1-RAS PUMP 7	0.48	Normal	0.125311	0.5	Level 0	0.017	3.696	B-DP1-RAS 7	
D-DP1-RAS PUMP 8	0.48	Normal	0.125311	0.5	Level 0	0.017	3.696	B-DP1-RAS 8	
D-DP1-WAS 5	0.48	Normal	0.246856	0.7	Level 0	0.016	4.573	B-MCC E1-PNL DP #1	
D-DP1-WAS 6	0.48	Normal	0.246856	0.7	Level 0	0.016	4.573	B-MCC E1-PNL DP #1	
D-DP2-RAS PUMP 1	0.48	Normal	0.109298	0.5	Level 0	0.017	3.255	B-DP2-RAS 1	
D-DP2-RAS PUMP 3	0.48	Normal	0.109298	0.5	Level 0	0.017	3.255	B-DP2-RAS 3	
D-DP2-WAS 1	0.48	Normal	0.256839	0.7	Level 0	0.017	4.605	B-DP2-WAS 1	
D-DP2-WAS 2	0.48	Normal	0.256839	0.7	Level 0	0.017	4.605	B-DP2-WAS 2	
D-DP4-RAS PUMP 2	0.48	Normal	0.131006	0.5	Level 0	0.016	3.912	B-MCC E2-PNL DP #4	
D-DP4-WAS 2	0.48	Normal	0.253921	0.7	Level 0	0.016	4.64	B-MCC E2-PNL DP #4	
D-DP4-WAS PUMP 2	0.48	Normal	0.061664	0.3	Level 0	0.017	1.916	B-DP4-WAS 2(2)	
D-MCC 1-EXHAUST 1	0.48	Normal	0.059442	0.3	Level 0	0.016	1.916	B-MCC 1-EXHAUST 1	
D-MCC 1-EXHAUST 2	0.48	Normal	0.059442	0.3	Level 0	0.016	1.916	B-MCC 1-EXHAUST 2	
D-MCC 1-EXHAUST 3	0.48	Normal	0.059442	0.3	Level 0	0.016	1.916	B-MCC 1-EXHAUST 3	
D-MCC 1-EXHAUST 4	0.48	Normal	0.059442	0.3	Level 0	0.016	1.916	B-MCC 1-EXHAUST 4	
D-MCC B1-AIR BLOWER	0.48	Normal	0.205632	0.6	Level 0	0.016	5.957	B-MCC B1-AIR BLOWER	
D-MCC B1-DAF THICK 2	0.48	Normal	0.065086	0.3	Level 0	0.017	2.003	B-MCC B1-DAF THICK 2	
D-MCC B1-EAST DAF RECYC	0.48	Normal	0.201457	0.6	Level 0	0.016	5.816	B-MCC B1-EAST DAF RECYC	
D-MCC B1-PRESSURIZATION	0.48	Normal	0.178662	0.6	Level 0	0.017	4.931	B-MCC B1-PRESSURIZATION	
D-MCC B1-THICK WAS 3	0.48	Normal	0.179676	0.6	Level 0	0.017	5.104	B-MCC B1-THICK WAS 3	
D-MCC B1-THICK WAS 4	0.48	Normal	0.179676	0.6	Level 0	0.017	5.104	B-MCC B1-THICK WAS 4	
D-MCC B1-WEST DAF RECYC	0.48	Normal	0.197409	0.6	Level 0	0.016	5.816	B-MCC B1-WEST DAF RECYC	
D-MCC B2-AIR COMPRESSOR	0.48	Normal	0.132846	0.5	Level 0	0.017	3.783	B-MCC B2-AIR COMPRESSOR	
D-MCC B2-EQ DIVERSION VLV	0.48	Normal	0.061657	0.3	Level 0	0.017	1.905	B-MCC B2-EQ DIVERSION VLV	
D-MCC B2-RETURN SLUDGE 1	0.48	Normal	0.089707	0.4	Level 0	0.017	2.695	B-MCC B2-RETURN SLUDGE 1	
D-MCC B2-RETURN SLUDGE 2	0.48	Normal	0.111977	0.5	Level 0	0.017	3.308	B-MCC B2-RETURN SLUDGE 2	
D-MCC B2-RETURN SLUDGE 3	0.48	Normal	0.099611	0.4	Level 0	0.017	2.969	B-MCC B2-RETURN SLUDGE 3	
D-MCC B2-RETURN SLUDGE 4	0.48	Normal	0.099611	0.4	Level 0	0.017	2.969	B-MCC B2-RETURN SLUDGE 4	
D-MCC B2-RETURN SLUDGE 5	0.48	Normal	0.089707	0.4	Level 0	0.017	2.695	B-MCC B2-RETURN SLUDGE 5	
D-MCC B3-STANDBY PRESSURE	0.48	Normal	0.178502	0.6	Level 0	0.016	5.299	B-MCC B3-STANDBY PRESSURE	
D-MCC D1-BFP FEED PUMP	0.48	Normal	0.079077	0.4	Level 0	0.017	2.336	B-MCC D1-BFP FEED PUMP	
D-MCC D1-BFP FEED PUMP5	0.48	Normal	0.083004	0.4	Level 0	0.017	2.448	B-MCC D1-BFP FEED PUMP5	
D-MCC D1-GRAVITY THICK	0.48	Normal	0.019927	0.2	Level 0	0.008	1.324	B-MCC D1-GRAVITY THICK	
D-MCC D1-SLUDGE RECIRC 1	0.48	Normal	0.120403	0.5	Level 0	0.017	3.509	B-MCC D1-SLUDGE RECIRC 1	
D-MCC D1-SLUDGE RECIRC 3	0.48	Normal	0.11201	0.5	Level 0	0.017	3.272	B-MCC D1-SLUDGE RECIRC 3	
D-MCC D1-SLUDGE RECIRC 4	0.48	Normal	0.103007	0.4	Level 0	0.017	3.063	B-MCC D1-SLUDGE RECIRC 4	
D-MCC D1-SLUDGE TRANSFER 1	0.48	Normal	0.130094	0.5	Level 0	0.017	3.781	B-MCC D1-SLUDGE TRANSFER 1	
D-MCC D1-THICKENER	0.48	Normal	0.04228	0.3	Level 0	0.017	1.331	B-MCC D1-THICKENER	
D-MCC D2-BFP FEED PUMP1	0.48	Normal	0.095996	0.4	Level 0	0.017	2.818	B-MCC D2-BFP FEED PUMP1	
D-MCC D2-BFP FEED PUMP4	0.48	Normal	0.074137	0.4	Level 0	0.017	2.195	B-MCC D2-BFP FEED PUMP4	
D-MCC D2-BFP FEED PUMP6	0.48	Normal	0.066609	0.4	Level 0	0.017	1.979	B-MCC D2-BFP FEED PUMP6	



ID	kV (kV)	Configuration	Total Energy (cal/cm²)	AFB (ft)	Energy Levels	Final FCT (sec)	Ia at FCT (kA)	Source PD ID	% Ia Variation
D-MCC D2-SLUDGE RECIRC 2	0.48	Normal	0.094129	0.4	Level 0	0.017	2.765	B-MCC D2-SLUDGE RECIRC 2	
D-MCC D2-SLUDGE TRANSFER2	0.48	Normal	0.045969	0.3	Level 0	0.017	1.394	B-MCC D2-SLUDGE TRANSFER2	
D-MCC D2-SLUDGE TRANSFER3	0.48	Normal	0.084162	0.4	Level 0	0.017	2.54	B-MCC D2-SLUDGE TRANSFER3	
D-MCC D2-SLUDGE TRANSFER4	0.48	Normal	0.131293	0.5	Level 0	0.017	3.833	B-MCC D2-SLUDGE TRANSFER4	
D-MCC DW1-PLANT DRAIN1	0.48	Normal	0.053807	0.3	Level 0	0.018	1.566	B-MCC DW1-PLANT DRAIN	
D-MCC DW1-PLANT DRAIN2	0.48	Normal	0.053807	0.3	Level 0	0.018	1.566	B-MCC DW1-PLANT DRAIN	
D-MCC DW1-PLANT DRAIN3	0.48	Normal	0.053807	0.3	Level 0	0.018	1.566	B-MCC DW1-PLANT DRAIN	
D-MCC E1-EF-7	0.48	Normal	0.058239	0.3	Level 0	0.017	1.807	B-MCC E1-EF-7	
D-MCC E1-FLASH MIXER 1	0.48	Normal	0.005152	0.1	Level 0	0.008	0.53	B-MCC E1-FLASH MIXER 1	
D-MCC E1-FLASH MIXER 2	0.48	Normal	0.010759	0.1	Level 0	0.008	0.748	B-MCC E1-FLASH MIXER 2	
D-MCC E2-EF-5.1	0.48	Normal	0.036999	0.3	Level 0	0.016	1.236	B-MCC E2-EF-5.1	
D-MCC E2-EF-5.2	0.48	Normal	0.036999	0.3	Level 0	0.016	1.236	B-MCC E2-EF-5.2	
D-MCC HW1-CONVEYOR EAST	0.48	Normal	0.080385	0.4	Level 0	0.016	2.533	B-MCC HW1-CONVEYOR EAST	
D-MCC HW1-FINAL CLAR. 3	0.48	Normal	0.005057	0.1	Level 0	0.016	0.269	B-MCC HW1-FINAL CLAR. 3	
D-MCC HW1-FINAL CLAR. 4	0.48	Normal	0.005132	0.1	Level 0	0.016	0.273	B-MCC HW1-FINAL CLAR. 4	
D-MCC HW1-GRIT CLASS WEST	0.48	Normal	0.03622	0.3	Level 0	0.02	0.969	B-MCC HW1-GRIT CLASS WEST	
D-MCC HW1-PRI. SLUDGE	0.48	Normal	0.377114	0.8	Level 0	0.84	0.382	B-MCC HW1-PRI. SLUDGE	
D-MCC HW1-RSP 4	0.48	Normal	0.09963	0.4	Level 0	0.019	2.639	B-MCC HW1-RSP 4	
D-MCC HW1-RSP 5	0.48	Normal	0.09963	0.4	Level 0	0.019	2.639	B-MCC HW1-RSP 5	
D-MCC HW1-WEST CONVEYOR	0.48	Normal	0.027518	0.2	Level 0	0.016	0.94	B-MCC HW1-WEST CONVEYOR	
D-MCC HW2-GRIT CLASS 2	0.48	Normal	0.044293	0.3	Level 0	0.017	1.37	B-MCC HW2-GRIT CLASS 2	
D-MCC HW2-GRIT PUMP 2	0.48	Normal	0.075771	0.4	Level 0	0.017	2.241	B-MCC HW2-GRIT PUMP 2	
D-MCC HW2-PRI. SLUDGE 1	0.48	Generator 2	0.335533	0.8	Level 0	0.544	0.518	B-MCC HW2-PRI. SLUDGE 1	
D-MCC HW2-PRI. SLUDGE 3	0.48	Generator 2	0.335533	0.8	Level 0	0.544	0.518	B-MCC HW2-PRI. SLUDGE 3	
D-MCC HW2-RSP 6	0.48	Normal	0.099132	0.4	Level 0	0.019	2.621	B-MCC HW2-RSP 6	
D-MCC HW2-WAS PUMP 3	0.48	Generator 1	0.037992	0.3	Level 0	0.035	0.611	B-MCC HW2-WAS PUMP 3	15%
D-MCC HW2-WAS PUMP 4	0.48	Generator 1	0.383813	0.8	Level 0	0.362	0.598	B-MCC HW2-WAS PUMP 4	15%
D-MCCB4-SUBM PUMP START	0.48	Normal	0.052456	0.3	Level 0	0.018	1.57	B-MCCB4-SUBM PUMP START	
DAF THICKENER 2 AFD	0.48	Normal	0.322744	0.8	Level 0	0.017	5.664	B-MCC B1-DAF THICK 2	
DAVIS SCRUBBER	0.48	Normal	0.349881	0.8	Level 0	0.017	5.98	B-MCC HW2-DAVIS SCRUBBER	
DEEP WELL PUMP 1 VFD	0.48	Normal	2.54	2.2	Level 1	0.07	9.407	B-SUB9-DEEP WELL 1 VFD	
DEEP WELL PUMP 2 VFD	0.48	Normal	2.7	2.2	Level 1	0.07	9.425	B-SUB9/10-DEEP WELL 2 VFD	
DEEP WELL PUMP 3 VFD	0.48	Normal	2.84	2.3	Level 1	0.07	9.89	B-SUB10-DEEP WELL 3 VFD	
DEEP WELL PUMP 4 VFD	0.48	Normal	1.69	1.8	Level 1	0.05	9.48	B-SWBD11-MAIN	
DEEP WELL PUMP 5 VFD	0.48	Normal	1.86	1.9	Level 1	0.05	10.356	B-SWBD12-MAIN	
DEEP WELL PUMP 6 VFD	0.48	Normal	1.89	1.9	Level 1	0.05	10.534	B-SWBD12-MAIN	
DEGRITTER CP	0.48	Normal	0.118752	0.4	Level 0	0.017	2.343	B-MCC HW2-DEGRITTER CP	
DP1 MAIN LS	0.48	Normal	0.338119	0.8	Level 0	0.016	6.152	B-MCC E1-PNL. DP #1	
DP2 MAIN LS	0.48	Normal	0.341476	0.8	Level 0	0.016	6.209	B-MCC E1-PNL. DP #2	
DP4 MAIN LS	0.48	Normal	0.346003	0.8	Level 0	0.016	6.178	B-MCC E2-PNL. DP #4	
EFF. FILTER PS CNTRL	0.48	Normal	0.33815	0.8	Level 0	0.016	6.048	B-MCC E2-EFF. FILTER PS	
ELECTRIC ROLL-UP DOOR	0.48	Normal	0.149438	0.5	Level 0	0.017	2.778	MCC 1-MAIN	
EQ TANK RETURN	0.48	Normal	0.110117	0.5	Level 0	0.017	2.095	B-MCC B4-EQ TANK RETURN	
FPL PRIMARY	23	Normal	36.34	16.5	Level 4	2	1.28	F-FPL SERVICE 1	
FPL SERVICE	4.16	Normal	81.19	12.3	> Level 4	2	18.642		
GEN BUS	4.16	Gen 1 & 2	9.6	4.2	Level 3	2	1.622	B-GEN 2	
GEN MASTER LS	4.16	Gen 1 & 2	4.54	11.8	Level 2	2	1.619	B-GEN 2	
HOIST	0.48	Normal	0.294439	0.7	Level 0	0.017	5.203	B-MCC B2-HOIST	
LIGHTING PANEL	0.208	Gen 1 & 2	4	3.1	Level 1		1.194		
LTG. PNL	0.208	Gen 1 & 2	4	3.1	Level 1		1.35		
MAIN GATE CP	0.48	Generator 1	0.07006	0.3	Level 0	0.043	0.612	B-MCC HW1-MAIN GATE	15%
MCC 1	0.48	Normal	0.262877	0.6	Level 0	0.017	5.013	MCC 1-MAIN	
MCC B1	0.48	Normal	0.749702	1.1	Level 0	0.025	9.061	MCC B1-MAIN	
MCC B2	0.48	Normal	0.68166	1.1	Level 0	0.025	8.31	B-SUB5-MCC B2	
MCC B3	0.48	Normal	0.725075	1.1	Level 0	0.025	8.824	B-SUB6-MCC B3	
MCC B4	0.48	Normal	0.677255	1.1	Level 0	0.025	8.281	B-SUB5-MCC B4	
MCC D1	0.48	Normal	0.545268	0.9	Level 0	0.027	6.331	B-SUB8-MCC D1	
MCC D2	0.48	Normal	0.535022	0.9	Level 0	0.027	6.17	B-SUB7-MCC D2	
MCC D4 LS	0.48	Gen 1 & 2	28.34	7.3	Level 4	2	3.798	F-TR-17A-P	15%
MCC D5 LS	0.48	Gen 1 & 2	28.34	7.3	Level 4	2	3.799	F-TR-18A-P	15%
MCC DW1	0.48	Normal	0.665803	1	Level 0	0.025	8.129	B-SUB8-MCC DW1	
MCC DW2	0.48	Normal	0.646237	1	Level 0	0.025	7.908	B-SUB7-MCC DW2	
MCC E1	0.48	Generator 1	0.774079	1.1	Level 0	0.042	5.841	B-SUB1-MCC E1	15%
MCC E2	0.48	Generator 1	0.714327	1.1	Level 0	0.04	5.657	B-SUB2-MCC E2	15%
MCC HW 1	0.48	Normal	0.737298	1.1	Level 0	0.027	8.307	B-SUB3-MCC HW1	
MCC HW 2	0.48	Normal	0.723144	1.1	Level 0	0.027	8.085	B-SUB4-MCC HW2	
MCC-D4	0.48	Normal	2.03	2.1	Level 1	0.08	7.241	B-MCC D4 MAIN	
MCC-D5	0.48	Normal	2.03	2.1	Level 1	0.08	7.243	B-MCC D5 MAIN	
MCC1 LS	0.48	Normal	0.268109	0.6	Level 0	0.017	5.013	B-SUB6-MCC 1	
MCCB1 LS	0.48	Normal	0.749702	1.1	Level 0	0.025	9.061	B-SUB6-MCC B1	
MCCD1 LS	0.48	Normal	0.545268	0.9	Level 0	0.027	6.331	B-SUB8-MCC D1	
MCCD2 LS	0.48	Normal	0.535022	0.9	Level 0	0.027	6.17	B-SUB7-MCC D2	
MECH SCREEN CP	0.48	Normal	0.101037	0.3	Level 0	0.017	2.07	B-MCC HW1-MECH SCREEN	
MOV RATE OF FLOW	0.48	Generator 1	0.053381	0.3	Level 0	0.028	0.674	B-MCC E2-MOV RATE	15%
MTS-AC1-LOAD	0.48	Normal	0.083446	0.4	Level 0	0.018	1.504	B-MCC D4-MTS	
MTS-MCC D4 LINE	0.48	Normal	0.083446	0.4	Level 0	0.018	1.504	B-MCC D4-MTS	
MTS-MCC D5-LINE	0.48	Normal	0.082574	0.4	Level 0	0.018	1.49	B-MCC D5-MTS	
NEW MAINT. BLDG	0.48	Normal	0.30304	0.8	Level 0	0.017	5.344	B-SUB8-NEW MAINT. BLDG	
OLD MAINTENANCE BLDG	0.48	Normal	0.204121	0.6	Level 0	0.017	3.619	B-MCC DW2-OLD MAINT.	
PLANT DRAIN #3	0.48	Normal	0.481073	0.9	Level 0	0.016	8.525	B-MCC DW1-PLANT DRAIN	
PLANT DRAIN PS CTL PNL	0.48	Normal	0.29921	0.7	Level 0	0.016	5.495	B-MCC-E2-PLANT DRAIN PS	
PMS-7A LS	4.16	Generator 2	4.2	2.8	Level 2	1.915	0.614	B-SWGR-SUB7	
PMS-8A LS	4.16	Generator 2	4.28	2.8	Level 2	1.983	0.614	B-SWGR-SUB8	
PNL CP	0.208	Gen 1 & 2	4	3.1	Level 1		1.014		
PNL DP #1	0.48	Normal	0.293245	0.6	Level 0	0.016	5.771	B-MCC E1-PNL. DP #1	
PNL DP #2	0.48	Normal	0.296952	0.6	Level 0	0.016	5.822	B-MCC E1-PNL. DP #2	
PNL DP #4	0.48	Normal	0.300028	0.6	Level 0	0.016	5.794	B-MCC E2-PNL. DP #4	

ID	kV (kV)	Configuration	Total Energy (cal/cm²)	AFB (ft)	Energy Levels	Final FCT (sec)	Ia at FCT (kA)	Source PD ID	% Ia Variation
PNL L1	0.208	Gen 1 & 2	4	3.1	Level 1		1.636		
PNL LB1	0.208	Gen 1 & 2	4	3.1	Level 1		1.341		
PNL LC1/LC2	0.208	Gen 1 & 2	4	3.1	Level 1		1.303		
PNL LD	0.208	Gen 1 & 2	4	2.7	Level 1		1.226		
PNL LD 2	0.208	Gen 1 & 2	4	2.7	Level 1		1.287		
PNL LDW	0.208	Gen 1 & 2	4	2.7	Level 1		1.289		
PNL LHW	0.208	Gen 1 & 2	4	3.1	Level 1		1.366		
PNL LP1	0.208	Gen 1 & 2	4	3.1	Level 1		0.738		
PNL LP2	0.208	Gen 1 & 2	4	3.1	Level 1		0.748		
PNL P3	0.48	Normal	0.393365	0.8	Level 0	0.016	7.404	B-PNL P3	
PNL PC/TC-2	0.208	Gen 1 & 2	4	3.1	Level 1		1.342		
PNL PC/TC-3	0.208	Gen 1 & 2	4	3.1	Level 1		1.294		
PNL PC/TC-4	0.208	Gen 1 & 2	4	2.7	Level 1		1.245		
PNL XLC	0.208	Gen 1 & 2	4	2.7	Level 1		0.569		
PNL XLC (2)	0.208	Gen 1 & 2	4	2.7	Level 1		0.569		
PNL-P1	0.48	Normal	0.182239	0.5	Level 0	0.016	3.717	B-SUB2-PNL P1	
PNL-P4	0.48	Normal	0.279707	0.6	Level 0	0.017	5.197	B-MCC E2-PNL P4	
POLYMER FEED 5, 6	0.48	Normal	0.115504	0.5	Level 0	0.017	2.145	B-MCC DW2-POLYMER FEED5/6	
POLYMER FEED CP	0.48	Normal	0.106161	0.4	Level 0	0.017	1.958	B-MCC DW2-POLYMER FEED	
POLYMER MIX CP	0.48	Normal	0.106702	0.4	Level 0	0.017	1.967	B-MCC DW1-POLYMER MIX	
RAS 1 VFD	0.48	Normal	0.323554	0.8	Level 0	0.016	5.895	B-MCC E1-PNL DP #2	
RAS 2 VFD	0.48	Normal	0.328217	0.8	Level 0	0.016	5.884	B-MCC E2-PNL DP #4	
RAS 3 VFD	0.48	Normal	0.323554	0.8	Level 0	0.016	5.895	B-MCC E1-PNL DP #2	
RAS 7 VFD	0.48	Normal	0.319808	0.8	Level 0	0.016	5.844	B-MCC E1-PNL DP #1	
RAS 8 VFD	0.48	Normal	0.319808	0.8	Level 0	0.016	5.844	B-MCC E1-PNL DP #1	
REUSE LIFT STATION PUMP	0.48	Normal	0.072122	0.4	Level 0	0.017	1.416	B-MCC E1-REUSE LIFT PUMP	
ROOF A/C #1	0.48	Normal	0.06861	0.4	Level 0	0.018	1.231	B-MCC E1-ROOF A/C #1	
S-DEEP WELL 2 LOAD	0.48	Normal	6.37	3.5	Level 2	0.17	9.89	B-SUB10-DEEP WELL PUMP 2	
S-DEEP WELL 5 LOAD	0.48	Normal	1.91	1.9	Level 1	0.05	10.657	B-SWBD12-MAIN	
S-MCC D1-PNL LD	0.48	Normal	0.258058	0.7	Level 0	0.017	4.606	B-MCC D1-PNL LD	
S-MCC D2-PNL LD	0.48	Normal	0.254006	0.7	Level 0	0.017	4.539	B-MCC D2-PNL LD	
S-MCC DW1-PNL LDW	0.48	Normal	0.337048	0.8	Level 0	0.017	5.897	B-MCC DW1-PNL LDW	
S-MCC DW2-PNL LDW	0.48	Normal	0.331781	0.8	Level 0	0.017	5.811	B-MCC DW2-PNL LDW	
S-MCC HW1-PNL LHW	0.48	Normal	0.227811	0.6	Level 0	0.017	6.687	B-MCC HW1-PNL LHW	
S-MCC HW2-PNL LHW	0.48	Normal	0.237664	0.7	Level 0	0.017	6.954	B-MCC HW2-PNL LHW	
S-MCCB2-PNL LB1	0.48	Normal	0.21713	0.6	Level 0	0.017	6.396	B-MCC B2-PNL LB1	
S-MCCB2-PNL P3	0.48	Normal	0.260428	0.7	Level 0	0.017	7.427	B-MCC B2-PNL P3	
S-MCCB3-PNL LB1	0.48	Normal	0.226124	0.6	Level 0	0.017	6.641	B-MCC B3-PNL LB1	
S-MCCB3-PNL P3	0.48	Normal	0.275479	0.7	Level 0	0.017	7.826	B-MCC B3-PNL P3	
S-MCCE1-PNL P4	0.48	Normal	0.162234	0.5	Level 0	0.017	4.778	B-MCC E1-PNL P4	
S-MCCE2-PNL P4	0.48	Normal	0.182775	0.6	Level 0	0.017	5.339	B-MCC E2-PNL P4	
S-PNL L1-LOAD	0.48	Normal	0.229017	0.6	Level 0	0.016	6.991	B-SUB2-PNL L1	
S-PNL LB1-LOAD	0.48	Normal	0.21713	0.6	Level 0	0.017	6.396	B-MCC B2-PNL LB1	
S-PNL LD LOAD	0.48	Normal	0.254006	0.7	Level 0	0.017	4.539	B-MCC D2-PNL LD	
S-PNL LDW LOAD	0.48	Normal	0.331781	0.8	Level 0	0.017	5.811	B-MCC DW2-PNL LDW	
S-PNL LHW LOAD	0.48	Normal	0.237664	0.7	Level 0	0.017	6.954	B-MCC HW2-PNL LHW	
S-PNL P1-LOAD	0.48	Normal	0.229017	0.6	Level 0	0.016	6.991	B-SUB2-PNL P1	
S-PNL P3-LOAD	0.48	Normal	0.260428	0.7	Level 0	0.017	7.427	B-MCC B2-PNL P3	
S-PNL P4-LOAD	0.48	Normal	0.182775	0.6	Level 0	0.017	5.339	B-MCC E2-PNL P4	
S-SUB1-PNL L1	0.48	Normal	0.253275	0.7	Level 0	0.016	7.673	B-SUB1-PNL L1	
S-SUB1-PNL P1	0.48	Normal	0.253275	0.7	Level 0	0.016	7.673	B-SUB1-PNL P1	
S-SUB2-PNL L1	0.48	Normal	0.229017	0.6	Level 0	0.016	6.991	B-SUB2-PNL L1	
S-SUB2-PNL P1	0.48	Normal	0.229017	0.6	Level 0	0.016	6.991	B-SUB2-PNL P1	
S-SUB9-DEEP WELL 2	0.48	Normal	4.84	3	Level 2	0.17	7.87	B-SUB9-DEEP WELL PUMP 2	15%
S-SUB10-DEEP WELL 2	0.48	Normal	6.37	3.5	Level 2	0.17	9.89	B-SUB10-DEEP WELL PUMP 2	
S-SWBD11-DEEP WELL 5	0.48	Normal	1.7	1.8	Level 1	0.05	9.53	B-SWBD11-MAIN	
S-SWBD12-DEEP WELL 5	0.48	Normal	1.91	1.9	Level 1	0.05	10.657	B-SWBD12-MAIN	
SCUM EJECTOR CP	0.48	Normal	0.051893	0.2	Level 0	0.022	0.865	B-MCC HW1-SCUM EJECTOR	
SEC CLARIFIERS 3, 4	0.48	Generator 1	0.021778	0.2	Level 0	0.027	0.685	B-MCC HW2-SEC CLARIFIER	
SLUDGE THICKENER DRIVE	0.48	Normal	0.158975	0.5	Level 0	0.017	2.894	B-MCC B2-SLUDGE THICKENER	
SLUICE GATE 2	0.48	Generator 1	0.263006	0.7	Level 0	0.378	0.591	B-MCC E2-SLUICE GATE 2	
SLUICE GATE #4	0.48	Generator 1	0.263211	0.7	Level 0	0.379	0.591	B-MCC E1-SLUICE GATE #4	
SODIUM BICARBONATE CP	0.48	Normal	0.309522	0.8	Level 0	0.017	5.335	B-MCC D1-SODIUM BICARB CP	
SUB 1 BUS A	0.48	Normal	1.06	1.8	Level 0	0.06	8.525	B-SUB1-MAIN	
SUB1 FEED	4.16	Normal	4.18	2.8	Level 2	0.099	17.39	B-SWGR-SUB1	
SUB1 LS	0.48	Gen 1 & 2	16.53	11.9	Level 3	2	3.781	F-SUB1-FEED	15%
SUB1/SUB9	4.16	Normal	4.48	2.9	Level 2	0.099	18.586	B-SWGR-SUB1	
SUB 2 BUS B	0.48	Normal	1.03	1.8	Level 0	0.06	8.28	B-SUB2-MAIN	
SUB2 FEED	4.16	Generator 2	4.3	2.8	Level 2	1.624	0.631	B-SWGR-SUB2	
SUB2 LS	0.48	Gen 1 & 2	16.62	11.9	Level 3	2	3.808	F-SUB2-FEED	15%
SUB2/SUB10	4.16	Normal	4.48	2.9	Level 2	0.099	18.583	B-SWGR-SUB2	
SUB 3 BUS A	0.48	Normal	1.03	1.8	Level 0	0.06	8.26	B-SUB3-MAIN	
SUB3 FEED	4.16	Generator 2	4.23	2.8	Level 2	1.661	0.627	B-SWGR-SUB3	
SUB3 MAIN LS	0.48	Gen 1 & 2	16.41	11.8	Level 3	2	3.765	F-SUB3-FEED	15%
SUB 4 BUS B	0.48	Normal	1.02	1.8	Level 0	0.06	8.208	B-SUB4-MAIN	
SUB4 FEED	4.16	Generator 2	4.38	2.9	Level 2	1.771	0.627	B-SWGR-SUB4	
SUB4 MAIN LS	0.48	Gen 1 & 2	16.42	11.8	Level 3	2	3.768	F-SUB4-FEED	15%
SUB 5 BUS A	0.48	Normal	1.02	1.8	Level 0	0.06	8.186	B-SUB5-MAIN	
SUB5 FEED	4.16	Generator 2	4.18	2.8	Level 2	1.787	0.619	B-SWGR-SUB3	
SUB5 MAIN LS	0.48	Gen 1 & 2	31	7.6	Level 4	2	4.166	F-SUB5-FEED	15%
SUB 6 BUS B	0.48	Normal	1.14	1.9	Level 0	0.06	9.049	B-SUB6-MAIN	
SUB6 FEED	4.16	Generator 2	4.37	2.9	Level 2	1.916	0.618	B-SWGR-SUB4	
SUB6 MAIN LS	0.48	Gen 1 & 2	31.53	7.7	Level 4	2	4.103	F-SUB6-FEED	15%
SUB 7 BUS A	0.48	Normal	0.979974	1.7	Level 0	0.06	7.899	B-SUB7-MAIN	
SUB7 FEED	4.16	Generator 2	4.2	2.8	Level 2	1.9	0.614	B-SWGR-SUB7	
SUB7 MAIN LS	0.48	Gen 1 & 2	15.93	11.6	Level 3	2	3.678	F-SUB7-FEED	15%
SUB7/SUB11	4.16	Normal	4.48	2.9	Level 2	0.099	18.583	B-SWGR-SUB7	

ID	kV (kV)	Configuration	Total Energy (cal/cm²)	AFB (ft)	Energy Levels	Final FCT (sec)	Ia at FCT (kA)	Source PD ID	% Ia Variation
SUB 8 BUS B	0.48	Normal	1.01	1.8	Level 0	0.06	8.106	B-SUB8-MAIN	
SUB8 FEED	4.16	Generator 2	4.28	2.8	Level 2	1.968	0.614	B-SWGR-SUB8	
SUB8 MAIN LS	0.48	Gen 1 & 2	15.87	11.5	Level 3	2	3.657	F-SUB8-FEED	15%
SUB8/SUB12	4.16	Normal	4.48	2.9	Level 2	0.099	18.586	B-SWGR-SUB8	
SUB 9 BUS A	0.48	Normal	5.41	5.6	Level 2	0.3	8.506	B-SUB9-MAIN	
SUB9 FEED	4.16	Normal	4.12	2.8	Level 2	0.099	17.158	B-SWGR-SUB1	
SUB9 LS	0.48	Gen 1 & 2	39.04	8.6	Level 4	2	5.018	F-SUB9-FEED	
SUB 10 BUS B	0.48	Normal	5.69	5.8	Level 2	0.3	8.793	B-SUB10-MAIN	
SUB10 FEED	4.16	Generator 2	4.3	2.8	Level 2	1.629	0.631	B-SWGR-SUB2	
SUB10 LS	0.48	Gen 1 & 2	39.58	8.6	Level 4	2	4.955	B-SWGR-SUB2	
SUB11 LS	0.48	Normal	49.79	9.7	> Level 4	1.777	7.832	F-SW11-XFMR	15%
SUB12 LS	0.48	Normal	53.67	10	> Level 4	1.906	7.748	F-SW12-XFMR	15%
SUBNATANT PUMP	0.48	Normal	0.385285	0.8	Level 0	0.017	6.673	B-MCC B1-SUBNATANT	
SUPERANANT PS CP	0.48	Normal	0.237446	0.7	Level 0	0.016	4.437	B-MCC D1-SUPERANANT	
SWBD 11 BUS A	0.48	Normal	0.88727	1.6	Level 0	0.05	8.528	B-SWBD11-MAIN	
SWBD11 LS	0.48	Normal	1.73	1.8	Level 1	0.05	9.722	B-SUB 11-SWBD 11	
SWBD 12 BUS B	0.48	Normal	0.99109	1.8	Level 0	0.05	9.448	B-SWBD12-MAIN	
SWBD12 LS	0.48	Normal	1.95	1.9	Level 1	0.05	10.847	B-SUB 12-SWBD 12	
SWGR BUS A	4.16	Normal	8.63	22.8	Level 3	0.423	16.998	B-SWGR-MAIN 2	
SWGR BUS B	4.16	Normal	8.61	22.7	Level 3	0.422	16.997	B-SWGR-MAIN 1	
SWGR MAIN 1 LS	4.16	Normal	38.4	105.7	Level 4	2	18.583		
SWGR MAIN 2 LS	4.16	Normal	38.4	105.7	Level 4	2	18.586		
SWITCH 11	4.16	Generator 2	4.29	2.8	Level 2	1.632	0.631	B-SWGR-SUB7	
SWITCH 12	4.16	Generator 2	4.35	2.9	Level 2	1.66	0.631	B-SWGR-SUB8	
T-AC-1	0.48	Generator 1	0.074474	0.4	Level 0	0.028	0.89	B-MCC D4-MTS	15%
T-BLOWER AB1	4.16	Gen 1 & 2	3.91	2.7	Level 1	0.583	3.093	B-BL AB1	
T-BLOWER AB2	4.16	Gen 1 & 2	3.92	2.7	Level 1	0.583	3.101	B-BL AB2	
T-BLOWER AB3	4.16	Gen 1 & 2	3.94	2.7	Level 1	0.583	3.11	B-BL AB3	
T-BLOWER AB4	4.16	Generator 2	2.65	2.2	Level 1	0.583	2.165	B-BL AB4	
T-BLOWER AB5	4.16	Generator 2	2.65	2.2	Level 1	0.583	2.168	B-BL AB5	
T-DEEP WELL PUMP 1	0.48	Normal	1.73	1.8	Level 1	0.07	6.34	B-SUB9-DEEP WELL 1 VFD	
T-DEEP WELL PUMP 2	0.48	Normal	1.78	1.8	Level 1	0.07	6.292	B-SUB9/10-DEEP WELL 2 VFD	
T-DEEP WELL PUMP 3	0.48	Normal	1.82	1.8	Level 1	0.07	6.438	B-SUB10-DEEP WELL 3 VFD	
T-DEEP WELL PUMP 4	0.48	Normal	1.17	1.5	Level 0	0.05	6.76	B-SWBD11-MAIN	
T-DEEP WELL PUMP 5	0.48	Normal	1.23	1.5	Level 1	0.05	7.058	B-SWBD12-MAIN	
T-DEEP WELL PUMP 6	0.48	Normal	1.23	1.5	Level 1	0.05	7.082	B-SWBD12-MAIN	
T-DP1-WAS PUMP 5	0.48	Normal	0.061958	0.3	Level 0	0.017	1.238	B-DP1-WAS 5(2)	
T-DP1-WAS PUMP 6	0.48	Normal	0.061958	0.3	Level 0	0.017	1.238	B-DP1-WAS 6(2)	
T-DP2-WAS PUMP 1	0.48	Normal	0.120036	0.5	Level 0	0.017	2.281	B-DP2-WAS 1(2)	
T-DP2-WAS PUMP 2	0.48	Normal	0.120036	0.5	Level 0	0.017	2.281	B-DP2-WAS 2(2)	
T-GEN 1	4.16	Gen 1 & 2	9.59	4.2	Level 3	2	6.862		
T-GEN 2	4.16	Gen 1 & 2	9.58	4.2	Level 3	2	6.857		
T-MCC D4-BLOWER 1	0.48	Normal	0.298819	0.7	Level 0	0.02	4.464	B-MCC D4-BLOWER 1	
T-MCC D4-BLOWER 3	0.48	Normal	0.327705	0.8	Level 0	0.02	4.862	B-MCC D4-BLOWER 3	
T-MCC D4-PMP 1	0.48	Normal	0.195973	0.6	Level 0	0.017	3.57	B-MCC D4-PMP 1	
T-MCC D4-PMP 3	0.48	Normal	0.222558	0.6	Level 0	0.017	4.016	B-MCC D4-PMP 3	
T-MCC D5-BLOWER 2	0.48	Normal	0.269617	0.7	Level 0	0.02	4.059	B-MCC D5-BLOWER 2	
T-MCC D5-BLOWER 4	0.48	Normal	0.327401	0.8	Level 0	0.02	4.858	B-MCC D5-BLOWER 4	
T-MCC D5-PMP 2	0.48	Normal	0.175021	0.6	Level 0	0.017	3.216	B-MCC D5-PMP 2	
T-MCC D5-PMP 4	0.48	Normal	0.222412	0.6	Level 0	0.017	4.014	B-MCC D5-PMP 4	
T-MCCD1-PNL LD	0.208	Gen 1 & 2	4	2.7	Level 1		1.236		
T-MCCDW1-PNL LDW	0.208	Gen 1 & 2	4	2.7	Level 1		1.3		
T-MCCHW1-PNL LHW 2	0.208	Gen 1 & 2	4	2.7	Level 1		1.391		
T-SUB2-PNL CP	0.208	Gen 1 & 2	4	2.7	Level 1		1.022		
T-SUB11-SWBD11	0.48	Normal	1.89	1.9	Level 1	0.05	10.527	B-SUB 11-SWBD 11	
T-SUB12-SWBD12	0.48	Normal	2.09	2	Level 1	0.05	11.561	B-SUB 12-SWBD 12	
T-TR-DP1-XLC	0.48	Normal	0.278821	0.7	Level 0	0.016	5.147	B-MCC E1-PNL. DP #1	
T-TR-DP4-XLC	0.48	Normal	0.287901	0.7	Level 0	0.016	5.212	B-MCC E2-PNL. DP #4	
T-TR-MCC 1-PNL XFMR	0.48	Normal	0.11391	0.5	Level 0	0.008	4.27	B-MCC 1-LP1	
T-TR-MCC 1-PNL XFMR (2)	0.208	Gen 1 & 2	4	2.7	Level 1		0.73		
T-TR-MCC B1-PNL XFMR	0.48	Normal	0.468092	0.9	Level 0	0.017	7.99	B-MCC B1-PNL	
T-TR-MCC B1-PNL XFMR2	0.208	Gen 1 & 2	4	2.7	Level 1		1.292		
T-TR-MCC B2-PNL (2)	0.208	Gen 1 & 2	4	2.7	Level 1		1.387		
T-TR-MCC B2-PNL LB1 (2)	0.208	Gen 1 & 2	4	2.7	Level 1		1.377		
T-TR-MCC D1-PNL LD 2	0.48	Normal	0.276754	0.7	Level 0	0.017	4.914	B-MCC D1-PNL. LD 2	
T-TR-MCC D1-PNL LD2 (2)	0.208	Gen 1 & 2	4	2.7	Level 1		1.309		
T-TR-MCCB2-PNL LB1	0.48	Normal	0.344051	0.8	Level 0	0.017	6.01	B-MCC B2-PNL LB1	
T-TR-MCCB2-PNL XFMR	0.48	Normal	0.386243	0.9	Level 0	0.016	6.804	B-PNL P3	
T-TR-MCCB4-PNL LP2	0.48	Normal	0.433566	0.9	Level 0	0.017	7.443	B-MCC B4-PNL LP2	
T-TR-MCCB4-PNL LP2 (2)	0.208	Gen 1 & 2	4	2.7	Level 1		0.745		
T-TR-MCCD1-PNL LD	0.48	Normal	0.237781	0.7	Level 0	0.017	4.27	B-MCC D2-PNL. LD	
T-TR-MCCDW1-PNL LDW	0.48	Normal	0.304649	0.8	Level 0	0.017	5.37	B-MCC DW2-PNL. LDW	
T-TR-MCCHW1-PNL LHW	0.48	Normal	0.419688	0.9	Level 0	0.017	7.222	B-MCC HW2-PNL LHW	
T-TR-SUB1/2-PNL L1 XFMR	0.48	Normal	0.4238	0.9	Level 0	0.016	7.582	B-SUB2-PNL L1	
T-TR-SUB1/2-PNL L1 XFMR 2	0.208	Gen 1 & 2	4	2.7	Level 1		2.367		
T-TR-SUB2-PNL CP XFMR	0.48	Normal	0.094888	0.4	Level 0	0.017	1.757	B-SUB2-PNL CP	
T-TR-SUB2-PNL CP XFMR 2	0.208	Gen 1 & 2	4	2.7	Level 1		1.036		
T-TR-T7A-PRI	4.16	Normal	0.084347	0.4	Level 0	0.004	8.603	F-TR-T7A-P	
T-TR-T7A-SEC	0.48	Gen 1 & 2	29.52	7.4	Level 4	2	3.93	F-TR-T7A-P	15%
T-TR-T8A-PRI	4.16	Normal	0.084656	0.4	Level 0	0.004	8.633	F-TR-T8A-P	
T-TR-T8A-SEC	0.48	Gen 1 & 2	29.52	7.4	Level 4	2	3.93	F-TR-T8A-P	15%
THICK WAS 3 AFD	0.48	Normal	0.555798	1	Level 0	0.017	9.365	B-MCC B1-THICK WAS 3	
THICK WAS 4 AFD	0.48	Normal	0.555798	1	Level 0	0.017	9.365	B-MCC B1-THICK WAS 4	
VALVE OPERATOR	0.48	Normal	0.214199	0.6	Level 0	0.017	3.877	B-MCC B3-VALVE OP	
WATER HEATER	0.48	Normal	0.426835	0.9	Level 0	0.017	7.198	B-MCC DW1-WATER HEATER	



**APPENDIX E – PROTECTION SETTINGS**

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

**ETAP**  
 12.6.0C

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**Protective Device Settings**

**OCR: R-GEN 1**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>	
Model:	489			Phase:	400/5	4.160	9.74	3 ph, Asym. (Calc.)
							12.70	L.G, Asym. (Calc.)
				GND:	400/5	4.160	12.70	L.G, Asym. (Calc.)

OC Level: OC1

		<u>Range</u>	<u>Setting</u>
Phase TOC	ANSI - Normal Inverse		
	Pickup (Tap)	0.15 - 20 xCT Sec	0.800
	Time Dial		16.000
Phase INST	Pickup	0.15 - 20 xCT Sec	12.500
	Time Delay	0 - 100 Sec	0.010

**OCR: R-GEN 2**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>	
Model:	489			Phase:	400/5	4.160	9.74	3 ph, Asym. (Calc.)
							12.70	L.G, Asym. (Calc.)
				GND:	400/5	4.160	12.70	L.G, Asym. (Calc.)

OC Level: OC1

		<u>Range</u>	<u>Setting</u>
Phase TOC	ANSI - Normal Inverse		
	Pickup (Tap)	0.15 - 20 xCT Sec	0.800
	Time Dial		16.000
Phase INST	Pickup	0.15 - 20 xCT Sec	12.500
	Time Delay	0 - 100 Sec	0.010

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

ETAP  
 12.6.0C

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 Date: 05-14-2015  
 Revision: Base

**Protective Device Settings**

**OCR: R-GEN MASTER**

MFR:	GE Multilin	Tag #:			
Model:	750/760			CT	Base kV
				1200/5	4.160
			Phase:		
					9.70 3 ph, Asym. (Calc.)
					12.22 L.G, Asym. (Calc.)
			GND:	1200/5	4.160
			Sen. GND:	1200/5	4.160
					12.22 L.G, Asym. (Calc.)
					12.22 L.G, Asym. (Calc.)

OC Level: OC1

		<u>Range</u>	<u>Setting</u>
Phase TOC	ANSI - Normal Inverse		
	Pickup (Tap)	0.05 - 20 xCT Sec	0.530
	Time Dial		19.000
Phase INST	Pickup	0.05 - 20 xCT Sec	10.000
	Time Delay	0 - 600 Sec	0.010
Ground TOC	ANSI - Extremely Inverse		
	Pickup (Tap)	0.05 - 20 xCT Sec	0.050
	Time Dial		0.010
Ground INST	Pickup	0.05 - 20 xCT Sec	20.000
	Time Delay	0 - 600 Sec	0.010
Neutral TOC	ANSI - Extremely Inverse		
	Pickup (Tap)	0.05 - 20 xCT Sec	0.050
	Time Dial		0.010
Neutral INST	Pickup	0.05 - 20 xCT Sec	20.000
	Time Delay	0 - 600 Sec	0.010
Sen. GND TOC	ANSI - Extremely Inverse		
	Pickup (Tap)	0.005 - 1 xCT Sec	0.005
	Time Dial		0.010
Sen. GND INST	Pickup	0.005 - 1 xCT Sec	1.000
	Time Delay	0 - 600 Sec	0.010

**OCR: R-SWGR-MAIN1**

MFR:	GE Multilin	Tag #:			
Model:	IFC			CT	Base kV
				800/5	4.160
			CT Input:		
					27.82 3 ph, Asym. (Calc.)
					35.29 L.G, Asym. (Calc.)

OC Level: OC1

		<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)		
	Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
	Time Dial		3.500

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**OCR: R-SWGR-MAIN1(2)**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC				CT Input: 800/5	4.160	27.83 3 ph, Asym. (Calc.)
					(Residual)		35.29 1.G, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	1.500
Time Dial		6.000

**OCR: R-SWGR-MAIN2**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC				CT Input: 800/5	4.160	27.83 3 ph, Asym. (Calc.)
							35.30 1.G, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		3.500

**OCR: R-SWGR-MAIN2(2)**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC				CT Input: 800/5	4.160	27.83 3 ph, Asym. (Calc.)
					(Residual)		35.30 1.G, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	1.500
Time Dial		6.000

**OCR: R-SWGR-SUB1**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC				CT Input: 300/5	4.160	27.83 3 ph, Asym. (Calc.)
							35.30 1.G, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		5.000
Phase INST Pickup	30 - 150 Sec - 5A	75.000

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**OCR: R-SWGR-SUB1(2)**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC				CT Input: 300/5	4.160	27.83 3 ph, Asym. (Calc.)
					(Residual)		35.30 L.G, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		2.000
Phase INST Pickup	30 - 150 Sec - 5A	50.000

**OCR: R-SWGR-SUB2**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC				CT Input: 300/5	4.160	27.82 3 ph, Asym. (Calc.)
							35.29 L.G, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		5.000
Phase INST Pickup	30 - 150 Sec - 5A	75.000

**OCR: R-SWGR-SUB2(2)**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC				CT Input: 300/5	4.160	27.82 3 ph, Asym. (Calc.)
					(Residual)		35.29 L.G, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		2.000
Phase INST Pickup	30 - 150 Sec - 5A	50.000

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
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**OCR: R-SWGR-SUB3**

MFR:	GE Multilin	Tag #:		<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC			CT Input: 300/5	4.160	27.82 3 ph, Asym. (Calc.)
						35.29 1G, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		5.000
Phase INST Pickup	30 - 150 Sec - 5A	75.000

**OCR: R-SWGR-SUB3(2)**

MFR:	GE Multilin	Tag #:		<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC			CT Input: 300/5	4.160	27.82 3 ph, Asym. (Calc.)
				(Residual)		35.29 1G, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		2.000
Phase INST Pickup	30 - 150 Sec - 5A	50.000

**OCR: R-SWGR-SUB4**

MFR:	GE Multilin	Tag #:		<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC			CT Input: 300/5	4.160	27.83 3 ph, Asym. (Calc.)
						35.30 1G, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		5.000
Phase INST Pickup	30 - 150 Sec - 5A	75.000

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**OCR: R-SWGR-SUB4(2)**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC				CT Input: 300/5	4.160	27.83 3 ph, Asym. (Calc.)
					(Residual)		35.30 LG, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		4.000
Phase INST Pickup	30 - 150 Sec - 5A	50.000

**OCR: R-SWGR-SUB7**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC				CT Input: 300/5	4.160	27.82 3 ph, Asym. (Calc.)
							35.29 LG, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		5.000
Phase INST Pickup	30 - 150 Sec - 5A	75.000

**OCR: R-SWGR-SUB7(2)**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC				CT Input: 300/5	4.160	27.82 3 ph, Asym. (Calc.)
					(Residual)		35.29 LG, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		2.000
Phase INST Pickup	30 - 150 Sec - 5A	50.000

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**Protective Device Settings**

**OCR: R-SWGR-SUB8**

MFR:	GE Multilin	Tag #:		<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC			CT Input: 300/5	4.160	27.83 3 ph, Asym. (Calc.)
						35.30 LG, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		5.000
Phase INST Pickup	30 - 150 Sec - 5A	75.000

**OCR: R-SWGR-SUB8(2)**

MFR:	GE Multilin	Tag #:		<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC			CT Input: 300/5	4.160	27.83 3 ph, Asym. (Calc.)
				(Residual)		35.30 LG, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		2.000
Phase INST Pickup	30 - 150 Sec - 5A	50.000

**OCR: R-SWGR-TIE**

MFR:	GE Multilin	Tag #:		<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	IFC			CT Input: 800/5	4.160	27.82 3 ph, Asym. (Calc.)
						35.29 LG, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	4.000
Time Dial		3.500



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**OCR: R-SWGR-TIE(2)**

MFR:	GE Multilin	Tag #:				
Model:	IFC			CT Input:	800/5	Base kV: 4.160
				(Residual)		If (kA): 27.82 3 ph, Asym. (Calc.)
						35.29 LG, Asym. (Calc.)

OC Level: OC1

	<u>Range</u>	<u>Setting</u>
Phase TOC	Very Inverse (53)	
Pickup (Tap)	0.5 - 4 Sec - 5A	1.500
Time Dial		6.000

**OLR: Relay1**

MFR:	GE Multilin	Tag #:				
Model:	269Plus			Phase:	800/5	Base kV: 4.160
						If (kA): 10.49 3 ph, Asym. (Calc.)
						6.33 LG, Asym. (Calc.)
				GND:	800/5	4.160
						6.33 LG, Asym. (Calc.)

	<u>Range</u>	<u>Setting</u>
Thermal	Curve 1	
Trip	1.05 - 1.25 xFLA	1.150
Acceleration	Start Up Curve	
Trip	1 - 1 xFLA	1.000
Multiplier		10.000
INST	Trip	4 - 12 xFLA
Delay		0.500
Jam	Trip	1.5 - 6 xFLA
Delay		0.500
Ground	Trip	0.1 - 1 xCT Pri
Delay		10.000

**OLR: Relay2**

MFR:	GE Multilin	Tag #:				
Model:	269Plus			Phase:	800/5	Base kV: 4.160
						If (kA): 10.49 3 ph, Asym. (Calc.)
						6.33 LG, Asym. (Calc.)
				GND:	800/5	4.160
						6.33 LG, Asym. (Calc.)

	<u>Range</u>	<u>Setting</u>
Thermal	Curve 1	
Trip	1.05 - 1.25 xFLA	1.150
Acceleration	Start Up Curve	
Trip	1 - 1 xFLA	1.000
Multiplier		10.000
INST	Trip	4 - 12 xFLA
Delay		0.500
Jam	Trip	1.5 - 6 xFLA
Delay		0.500
Ground	Trip	0.1 - 1 xCT Pri
Delay		10.000

Project: MANATEE COUNTY ESS  
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 Engineer: KTW  
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**OLR: Relay3**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	269Plus			Phase:	800/5	4.160	10.65 3 ph, Asym. (Calc.)
							6.31 LG, Asym. (Calc.)
				GND:	800/5	4.160	6.31 LG, Asym. (Calc.)
		<u>Range</u>	<u>Setting</u>				
<b>Thermal</b>	Curve 1						
	Trip	1.05 - 1.25 xFLA	1.150				
<b>Acceleration</b>	Start Up Curve						
	Trip	1 - 1 xFLA	1.000				
	Multiplier		10.000				
<b>INST</b>	Trip	4 - 12 xFLA	4.000				
	Delay		0.500				
<b>Jam</b>	Trip	1.5 - 6 xFLA	1.500				
	Delay		0.500				
<b>Ground</b>	Trip	0.1 - 1 xCT Pri	0.800				
	Delay		10.000				

**OLR: Relay4**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	269Plus			Phase:	800/5	4.160	10.65 3 ph, Asym. (Calc.)
							6.31 LG, Asym. (Calc.)
				GND:	800/5	4.160	6.31 LG, Asym. (Calc.)
		<u>Range</u>	<u>Setting</u>				
<b>Thermal</b>	Curve 1						
	Trip	1.05 - 1.25 xFLA	1.150				
<b>Acceleration</b>	Start Up Curve						
	Trip	1 - 1 xFLA	1.000				
	Multiplier		10.000				
<b>INST</b>	Trip	4 - 12 xFLA	4.000				
	Delay		0.500				
<b>Jam</b>	Trip	1.5 - 6 xFLA	1.500				
	Delay		0.500				
<b>Ground</b>	Trip	0.1 - 1 xCT Pri	0.800				
	Delay		10.000				

Project: MANATEE COUNTY ESS  
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 Engineer: KTW  
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**Protective Device Settings**

**OLR: Relay5**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	269Plus			Phase:	800/5	4.160	10.65 3 ph, Asym. (Calc.)
							6.31 LG, Asym. (Calc.)
				GND:	800/5	4.160	6.31 LG, Asym. (Calc.)
		<u>Range</u>	<u>Setting</u>				
<b>Thermal</b>	Curve 1						
	Trip	1.05 - 1.25 xFLA	1.150				
<b>Acceleration</b>	Start Up Curve						
	Trip	1 - 1 xFLA	1.000				
	Multiplier		10.000				
<b>INST</b>	Trip	4 - 12 xFLA	4.000				
	Delay		0.500				
<b>Jam</b>	Trip	1.5 - 6 xFLA	1.500				
	Delay		0.500				
<b>Ground</b>	Trip	0.1 - 1 xCT Pri	0.800				
	Delay		10.000				

**OLR: R-GEN 1**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	489			Phase:	400/5	4.160	9.74 3 ph, Asym. (Calc.)
							12.70 LG, Asym. (Calc.)
				GND:	400/5	4.160	12.70 LG, Asym. (Calc.)
		<u>Range</u>	<u>Setting</u>				
<b>Thermal</b>	Standard Overload Curve						
	Trip	1.01 - 1.25 xFLA	1.010				
	Multiplier		1.000				

**OLR: R-GEN 2**

MFR:	GE Multilin	Tag #:			<u>CT</u>	<u>Base kV</u>	<u>If (kA)</u>
Model:	489			Phase:	400/5	4.160	9.74 3 ph, Asym. (Calc.)
							12.70 LG, Asym. (Calc.)
				GND:	400/5	4.160	12.70 LG, Asym. (Calc.)
		<u>Range</u>	<u>Setting</u>				
<b>Thermal</b>	Standard Overload Curve						
	Trip	1.01 - 1.25 xFLA	1.010				
	Multiplier		1.000				

**Fuse: F-BLAB1**

MFR:		Tag #:		3-Phase kA:	10.65	Asym. (Calc.)
Model:		kV:	0.000	LG kA:	6.31	Asym. (Calc.)
Speed:		Int. kA:	0.000	Base kV:	4.160	(Calc.)
Size:		Cont. Amp:	0.000			

Project: MANATEE COUNTY ESS  
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**Protective Device Settings**

**Fuse: F-BLAB2**

MFR:	Tag #:	3-Phase kA:	10.65	Asym. (Calc.)
Model:	kV:	0.000	LG kA:	6.31 Asym. (Calc.)
Speed:	Int. kA:	0.000	Base kV:	4.160 (Calc.)
Size:	Cont. Amp:	0.000		

**Fuse: F-BLAB3**

MFR:	Tag #:	3-Phase kA:	10.65	Asym. (Calc.)
Model:	kV:	0.000	LG kA:	6.31 Asym. (Calc.)
Speed:	Int. kA:	0.000	Base kV:	4.160 (Calc.)
Size:	Cont. Amp:	0.000		

**Fuse: F-BLAB4**

MFR:	Tag #:	3-Phase kA:	10.49	Asym. (Calc.)
Model:	kV:	0.000	LG kA:	6.33 Asym. (Calc.)
Speed:	Int. kA:	0.000	Base kV:	4.160 (Calc.)
Size:	Cont. Amp:	0.000		

**Fuse: F-BLAB5**

MFR:	Tag #:	3-Phase kA:	10.49	Asym. (Calc.)
Model:	kV:	0.000	LG kA:	6.33 Asym. (Calc.)
Speed:	Int. kA:	0.000	Base kV:	4.160 (Calc.)
Size:	Cont. Amp:	0.000		

**Fuse: F-BLOWER A-FEED**

MFR:	Cutler-Hammer*	Tag #:	3-Phase kA:	10.49	Asym. (Calc.)
Model:	CLE (7/03)	kV:	5.500	LG kA:	6.33 Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160 (Calc.)
Size:	400E	Cont. Amp:	400.000		

\* Retrieved library data is modified by user.

**Fuse: F-BLOWER B-FEED**

MFR:	Cutler-Hammer*	Tag #:	3-Phase kA:	10.65	Asym. (Calc.)
Model:	CLE (7/03)	kV:	5.500	LG kA:	6.31 Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160 (Calc.)
Size:	400E	Cont. Amp:	400.000		

\* Retrieved library data is modified by user.

**Fuse: F-FPL SERVICE 1**

MFR:	Kearney	Tag #:	3-Phase kA:	1.88	Asym. (Calc.)
Model:	Type K (Fit-All)	kV:	27.000	LG kA:	0.00 Asym. (Calc.)
Speed:	Fast	Int. kA:	0.000	Base kV:	23.000 (Calc.)
Size:	140A	Cont. Amp:	140.000		

Project: MANATEE COUNTY ESS  
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 Engineer: KTW  
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**Protective Device Settings**

**Fuse: F-FPL SERVICE 2**

MFR:	Kearney	Tag #:		3-Phase kA:	1.88	Asym. (Calc.)
Model:	Type K (Fit-All)	kV:	27.000	LG kA:	0.00	Asym. (Calc.)
Speed:	Fast	Int. kA:	0.000	Base kV:	23.000	(Calc.)
Size:	140A	Cont. Amp:	140.000			

**Fuse: F-FPL SERVICE 3**

MFR:	Kearney	Tag #:		3-Phase kA:	1.88	Asym. (Calc.)
Model:	Type K (Fit-All)	kV:	27.000	LG kA:	0.00	Asym. (Calc.)
Speed:	Fast	Int. kA:	0.000	Base kV:	23.000	(Calc.)
Size:	140A	Cont. Amp:	140.000			

**Fuse: F-SUB10-FEED**

MFR:	General Electric	Tag #:		3-Phase kA:	24.26	Asym. (Calc.)
Model:	9F62 EJO-1	kV:	5.500	LG kA:	24.74	Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160	(Calc.)
Size:	125A	Cont. Amp:	125.000			

**Fuse: F-SUB1-FEED**

MFR:	General Electric	Tag #:		3-Phase kA:	24.49	Asym. (Calc.)
Model:	9F62 EJO-1	kV:	5.500	LG kA:	25.42	Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160	(Calc.)
Size:	100A	Cont. Amp:	100.000			

**Fuse: F-SUB2-FEED**

MFR:	General Electric	Tag #:		3-Phase kA:	25.14	Asym. (Calc.)
Model:	9F62 EJO-1	kV:	5.500	LG kA:	27.04	Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160	(Calc.)
Size:	100A	Cont. Amp:	100.000			

**Fuse: F-SUB3-FEED**

MFR:	General Electric	Tag #:		3-Phase kA:	17.95	Asym. (Calc.)
Model:	9F62 EJO-1	kV:	5.500	LG kA:	13.98	Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160	(Calc.)
Size:	100A	Cont. Amp:	100.000			

**Fuse: F-SUB4-FEED**

MFR:	General Electric	Tag #:		3-Phase kA:	18.02	Asym. (Calc.)
Model:	9F62 EJO-1	kV:	5.500	LG kA:	13.86	Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160	(Calc.)
Size:	100A	Cont. Amp:	100.000			

**Fuse: F-SUB5-FEED**

MFR:	General Electric	Tag #:		3-Phase kA:	11.96	Asym. (Calc.)
Model:	9F62 EJO-1	kV:	5.500	LG kA:	7.58	Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160	(Calc.)
Size:	100A	Cont. Amp:	100.000			

Project: MANATEE COUNTY ESS  
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**Fuse: F-SUB6-FEED**

MFR:	General Electric	Tag #:		3-Phase kA:	12.13	Asym. (Calc.)
Model:	9F62 EJO-1	kV:	5.500	LG kA:	7.54	Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160	(Calc.)
Size:	100A	Cont. Amp:	100.000			

**Fuse: F-SUB7-FEED**

MFR:	General Electric	Tag #:		3-Phase kA:	10.11	Asym. (Calc.)
Model:	9F62 EJO-1	kV:	5.500	LG kA:	6.10	Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160	(Calc.)
Size:	100A	Cont. Amp:	100.000			

**Fuse: F-SUB8-FEED**

MFR:	General Electric	Tag #:		3-Phase kA:	10.15	Asym. (Calc.)
Model:	9F62 EJO-1	kV:	5.500	LG kA:	6.11	Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160	(Calc.)
Size:	100A	Cont. Amp:	100.000			

**Fuse: F-SUB9-FEED**

MFR:	General Electric	Tag #:		3-Phase kA:	23.91	Asym. (Calc.)
Model:	9F62 EJO-1	kV:	5.500	LG kA:	24.03	Asym. (Calc.)
Speed:	Other	Int. kA:	50.000	Base kV:	4.160	(Calc.)
Size:	125A	Cont. Amp:	125.000			

**Fuse: F-SW11-MAIN**

MFR:	Square D	Tag #:		3-Phase kA:	23.60	Asym. (Calc.)
Model:	55GFMSJD	kV:	5.500	LG kA:	23.37	Asym. (Calc.)
Speed:	Other	Int. kA:	65.000	Base kV:	4.160	(Calc.)
Size:	150E	Cont. Amp:	150.000			

**Fuse: F-SW11-SUB13**

MFR:	Square D	Tag #:		3-Phase kA:	23.60	Asym. (Calc.)
Model:	55GFMSJD	kV:	5.500	LG kA:	23.37	Asym. (Calc.)
Speed:	Other	Int. kA:	65.000	Base kV:	4.160	(Calc.)
Size:	300E	Cont. Amp:	300.000			

**Fuse: F-SW11-XFMR**

MFR:	Square D	Tag #:		3-Phase kA:	23.60	Asym. (Calc.)
Model:	55GFMSJD	kV:	5.500	LG kA:	23.37	Asym. (Calc.)
Speed:	Other	Int. kA:	65.000	Base kV:	4.160	(Calc.)
Size:	150E	Cont. Amp:	150.000			

**Fuse: F-SW12-MAIN**

MFR:	Square D	Tag #:		3-Phase kA:	23.96	Asym. (Calc.)
Model:	55GFMSJD	kV:	5.500	LG kA:	24.06	Asym. (Calc.)
Speed:	Other	Int. kA:	65.000	Base kV:	4.160	(Calc.)
Size:	150E	Cont. Amp:	150.000			

Project: MANATEE COUNTY ESS  
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**Protective Device Settings**

**Fuse: F-SW12-SUB14**

MFR:	Square D	Tag #:		3-Phase kA:	23.96	Asym. (Calc.)
Model:	55GFMSJD	kV:	5.500	LG kA:	24.06	Asym. (Calc.)
Speed:	Other	Int. kA:	65.000	Base kV:	4.160	(Calc.)
Size:	300E	Cont. Amp:	300.000			

**Fuse: F-SW12-XFMR**

MFR:	Square D	Tag #:		3-Phase kA:	23.96	Asym. (Calc.)
Model:	55GFMSJD	kV:	5.500	LG kA:	24.06	Asym. (Calc.)
Speed:	Other	Int. kA:	65.000	Base kV:	4.160	(Calc.)
Size:	150E	Cont. Amp:	150.000			

**Fuse: F-TR-T7A-G**

MFR:	G&W	Tag #:		3-Phase kA:	9.72	Asym. (Calc.)
Model:	PAF	kV:	5.500	LG kA:	5.92	Asym. (Calc.)
Speed:	Other	Int. kA:	40.000	Base kV:	4.160	(Calc.)
Size:	200A	Cont. Amp:	200.000			

**Fuse: F-TR-T7A-P**

MFR:	G&W*	Tag #:		3-Phase kA:	9.72	Asym. (Calc.)
Model:	PAF	kV:	5.500	LG kA:	5.92	Asym. (Calc.)
Speed:	Other	Int. kA:	40.000	Base kV:	4.160	(Calc.)
Size:	200A	Cont. Amp:	225.000			

\* Retrieved library data is modified by user.

**Fuse: F-TR-T8A**

MFR:	Cooper	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	Bay-O-Net (240-46)	kV:	4.160	LG kA:	0.00	Asym. (Calc.)
Speed:	Other	Int. kA:	3.500	Base kV:	0.000	(Calc.)
Size:	C18	Cont. Amp:	140.000			

**Fuse: F-TR-T8A-G**

MFR:	G&W	Tag #:		3-Phase kA:	9.76	Asym. (Calc.)
Model:	PAF	kV:	5.500	LG kA:	5.93	Asym. (Calc.)
Speed:	Other	Int. kA:	40.000	Base kV:	4.160	(Calc.)
Size:	200A	Cont. Amp:	200.000			

**Fuse: F-TR-T8A-P**

MFR:	G&W*	Tag #:		3-Phase kA:	9.76	Asym. (Calc.)
Model:	PAF	kV:	5.500	LG kA:	5.93	Asym. (Calc.)
Speed:	Other	Int. kA:	40.000	Base kV:	4.160	(Calc.)
Size:	200A	Cont. Amp:	225.000			

\* Retrieved library data is modified by user.

**CB: B-DEEP WELL 5 VFD**

MFR:	ABB	Tag #:		3-Phase kA:	18.19	Asym. (Calc.)
Model:	S6N	Rating:	50 kA, 0.48 kV	LG kA:	14.97	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

Project: MANATEE COUNTY ESS  
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**Protective Device Settings**

**CB: B-DEEP WELL 5 VFD**

MFR:	ABB	Tag #:		3-Phase kA:	18.19	Asym. (Calc.)
Model:	S6N	Rating:	50 kA, 0.48 kV	LG kA:	14.97	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: ABB  
 Model: SACE PR211  
 Sensor: 600

Phase Setting

Long-Time	LT Pickup	1.0
	LT Band	Curve D
INST	Inst. Pickup	12

**CB: B-DP1 MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	9.05	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	6.98	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: Micrologic 2.2 M (PP)  
 Sensor: 250

Phase Setting

Long-Time	FLA	114 A	LT Band	Class 5
Short-Time	Isd	5 x FLA		
	tsd	Fixed		
INST	Ii	Fixed		

**CB: B-DP1 MAIN1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.000	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: Micrologic 2.2 M (PP)  
 Sensor: 250

Phase Setting

Long-Time	FLA	114 A	LT Band	Class 5
Short-Time	Isd	5 x FLA		
	tsd	Fixed		
INST	Ii	Fixed		



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**Protective Device Settings**

**CB: B-DP1-CLARIFIER**

MFR:	Square-D	Tag #:		3-Phase kA:	9.05	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	6.98	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	20		

**CB: B-DP1-CLARIFIER1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	20		

**CB: B-DP1-RAS 1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	70	Cont. Amp:	70.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	70		

**CB: B-DP1-RAS 2**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	70	Cont. Amp:	70.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	70		

**CB: B-DP1-RAS 7**

MFR:	Square-D	Tag #:		3-Phase kA:	9.05	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	6.98	Asym. (Calc.)
Size:	70	Cont. Amp:	70.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	70		

Project: MANATEE COUNTY ESS  
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**Protective Device Settings**

**CB: B-DP1-RAS 8**

MFR:	Square-D	Tag #:		3-Phase kA:	9.05	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	6.98	Asym. (Calc.)
Size:	70	Cont. Amp:	70.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	70		

**CB: B-DP1-WAS 1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	15		

**CB: B-DP1-WAS 2**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	15		

**CB: B-DP1-WAS 5**

MFR:	Square-D	Tag #:		3-Phase kA:	9.05	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	6.98	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	15		

**CB: B-DP1-WAS 5(2)**

MFR:	Square-D	Tag #:		3-Phase kA:	6.18	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	4.21	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	15		

Project: MANATEE COUNTY ESS  
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**Protective Device Settings**

**CB: B-DP1-WAS 5(2)1**

MFR: Square-D	Tag #:	3-Phase kA: 0.00	Asym. (Calc.)
Model: EDB	Rating: 18 kA, 0.48 kV	LG kA: 0.00	Asym. (Calc.)
Size: 15	Cont. Amp: 15.000	Base kV: 0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: EDB	Magnetic Trip: FIXED
ID: 15	

**CB: B-DP1-WAS 6**

MFR: Square-D	Tag #:	3-Phase kA: 9.05	Asym. (Calc.)
Model: EDB	Rating: 18 kA, 0.48 kV	LG kA: 6.98	Asym. (Calc.)
Size: 15	Cont. Amp: 15.000	Base kV: 0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: EDB	Magnetic Trip: FIXED
ID: 15	

**CB: B-DP1-WAS 6(2)**

MFR: Square-D	Tag #:	3-Phase kA: 6.18	Asym. (Calc.)
Model: EDB	Rating: 18 kA, 0.48 kV	LG kA: 4.21	Asym. (Calc.)
Size: 15	Cont. Amp: 15.000	Base kV: 0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: EDB	Magnetic Trip: FIXED
ID: 15	

**CB: B-DP1-WAS 6(2)1**

MFR: Square-D	Tag #:	3-Phase kA: 0.00	Asym. (Calc.)
Model: EDB	Rating: 18 kA, 0.48 kV	LG kA: 0.00	Asym. (Calc.)
Size: 15	Cont. Amp: 15.000	Base kV: 0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: EDB	Magnetic Trip: FIXED
ID: 15	

**CB: B-DP1-XLC**

MFR: Square-D	Tag #:	3-Phase kA: 9.05	Asym. (Calc.)
Model: EDB	Rating: 18 kA, 0.48 kV	LG kA: 6.98	Asym. (Calc.)
Size: 30	Cont. Amp: 30.000	Base kV: 0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: EDB	Magnetic Trip: FIXED
ID: 30	

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 Engineer: KTW  
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**Protective Device Settings**

**CB: B-DP1-XLC (2)**

MFR:	Square-D	Tag #:		3-Phase kA:	7.08	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	5.06	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	30		

**CB: B-DP1-XLC (2)1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	30		

**CB: B-DP1-XLC1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	30		

**CB: B-DP2 MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	9.15	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	7.09	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR:	Square-D
Model:	Micrologic 2.2 M (PP)
Sensor:	250

Phase Setting

Long-Time	FLA	114 A	LT Band	Class 5
Short-Time	Isd	5 x FLA		
	tsd	Fixed		
	INST li	Fixed		

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**Protective Device Settings**

**CB: B-DP2 MAIN1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.000	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: Micrologic 2.2 M (PP)  
 Sensor: 250

Phase Setting

Long-Time	FLA	114 A	LT Band	Class 5
Short-Time	Isd	5 x FLA		
	tsd	Fixed		
INST	li	Fixed		

**CB: B-DP2-CLARIFIER1**

MFR:	Square-D	Tag #:		3-Phase kA:	9.15	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	7.09	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D                      Thermal Trip: Fixed  
 Model: EDB                         Magnetic Trip: FIXED  
 ID: 20

**CB: B-DP2-CLARIFIER2**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D                      Thermal Trip: Fixed  
 Model: EDB                         Magnetic Trip: FIXED  
 ID: 20

**CB: B-DP2-RAS 1**

MFR:	Square-D	Tag #:		3-Phase kA:	9.15	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	7.09	Asym. (Calc.)
Size:	70	Cont. Amp:	70.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D                      Thermal Trip: Fixed  
 Model: EDB                         Magnetic Trip: FIXED  
 ID: 70

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Protective Device Settings

**CB: B-DP2-RAS 2**

MFR: Square-D Tag #: 3-Phase kA: 0.00 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 0.00 Asym. (Calc.)  
Size: 70 Cont. Amp: 70.000 Base kV: 0.000 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 70

**CB: B-DP2-RAS 3**

MFR: Square-D Tag #: 3-Phase kA: 9.15 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 7.09 Asym. (Calc.)  
Size: 70 Cont. Amp: 70.000 Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 70

**CB: B-DP2-RAS 4**

MFR: Square-D Tag #: 3-Phase kA: 0.00 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 0.00 Asym. (Calc.)  
Size: 70 Cont. Amp: 70.000 Base kV: 0.000 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 70

**CB: B-DP2-SPARE1**

MFR: Square-D Tag #: 3-Phase kA: 9.15 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 7.09 Asym. (Calc.)  
Size: 70 Cont. Amp: 70.000 Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 70

**CB: B-DP2-SPARE2**

MFR: Square-D Tag #: 3-Phase kA: 9.15 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 7.09 Asym. (Calc.)  
Size: 70 Cont. Amp: 70.000 Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 70

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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Protective Device Settings

**CB: B-DP2-SPARE3**

MFR: Square-D Tag #: 3-Phase kA: 0.00 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 0.00 Asym. (Calc.)  
Size: 70 Cont. Amp: 70.000 Base kV: 0.000 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 70

**CB: B-DP2-SPARE4**

MFR: Square-D Tag #: 3-Phase kA: 0.00 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 0.00 Asym. (Calc.)  
Size: 70 Cont. Amp: 70.000 Base kV: 0.000 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 70

**CB: B-DP2-WAS 1**

MFR: Square-D Tag #: 3-Phase kA: 9.15 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 7.09 Asym. (Calc.)  
Size: 15 Cont. Amp: 15.000 Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 15

**CB: B-DP2-WAS 1(2)**

MFR: Square-D Tag #: 3-Phase kA: 6.22 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 4.24 Asym. (Calc.)  
Size: 15 Cont. Amp: 15.000 Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 15

**CB: B-DP2-WAS 1(2)1**

MFR: Square-D Tag #: 3-Phase kA: 0.00 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 0.00 Asym. (Calc.)  
Size: 15 Cont. Amp: 15.000 Base kV: 0.000 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 15

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-DP2-WAS 2**

MFR:	Square-D	Tag #:		3-Phase kA:	9.15	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	7.09	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	15		

**CB: B-DP2-WAS 2(2)**

MFR:	Square-D	Tag #:		3-Phase kA:	6.22	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	4.24	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	15		

**CB: B-DP2-WAS 2(2)1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	15		

**CB: B-DP2-WAS 3**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	15		

**CB: B-DP2-WAS 4**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	15		



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-DP4 MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	9.26	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	7.37	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: Micrologic 2.2 M (PP)  
 Sensor: 250

Phase Setting

Long-Time	FLA	114 A	LT Band	Class 5
Short-Time	Isd	5 x FLA		
	tsd	Fixed		
INST	Ii	Fixed		

**CB: B-DP4 MAIN1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.000	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: Micrologic 2.2 M (PP)  
 Sensor: 250

Phase Setting

Long-Time	FLA	114 A	LT Band	Class 5
Short-Time	Isd	5 x FLA		
	tsd	Fixed		
INST	Ii	Fixed		

**CB: B-DP4-CLARIFIER**

MFR:	Square-D	Tag #:		3-Phase kA:	9.26	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	7.37	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	20		

**CB: B-DP4-CLARIFIER1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	20		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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Protective Device Settings

**CB: B-DP4-RAS 1**

MFR: Square-D Tag #: 3-Phase kA: 0.00 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 0.00 Asym. (Calc.)  
Size: 70 Cont. Amp: 70.000 Base kV: 0.000 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 70

**CB: B-DP4-RAS 2**

MFR: Square-D Tag #: 3-Phase kA: 9.26 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 7.37 Asym. (Calc.)  
Size: 70 Cont. Amp: 70.000 Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 70

**CB: B-DP4-WAS 1**

MFR: Square-D Tag #: 3-Phase kA: 0.00 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 0.00 Asym. (Calc.)  
Size: 15 Cont. Amp: 15.000 Base kV: 0.000 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 15

**CB: B-DP4-WAS 2**

MFR: Square-D Tag #: 3-Phase kA: 9.26 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 7.37 Asym. (Calc.)  
Size: 15 Cont. Amp: 15.000 Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 15

**CB: B-DP4-WAS 2(2)**

MFR: Square-D Tag #: 3-Phase kA: 6.28 Asym. (Calc.)  
Model: EDB Rating: 18 kA, 0.48 kV LG kA: 4.38 Asym. (Calc.)  
Size: 15 Cont. Amp: 15.000 Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: EDB Magnetic Trip: FIXED  
ID: 15

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-DP4-WAS 2(2)1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	15		

**CB: B-DP4-XLC**

MFR:	Square-D	Tag #:		3-Phase kA:	9.26	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	7.37	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	30		

**CB: B-DP4-XLC (2)**

MFR:	Square-D	Tag #:		3-Phase kA:	7.19	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	5.28	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	30		

**CB: B-DP4-XLC (2)1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	30		

**CB: B-DP4-XLC1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	EDB	Rating:	18 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	EDB	Magnetic Trip:	FIXED
ID:	30		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC 1-ABFV-1**

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36015M03  
Pick up:

**CB: B-MCC 1-ABFV-2**

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36015M03  
Pick up:

**CB: B-MCC 1-ABFV-3**

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36015M03  
Pick up:

**CB: B-MCC 1-ABFV-4**

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36015M03  
Pick up:

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC 1-ABFV-5**

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36015M03  
Pick up:

**CB: B-MCC 1-ACU 1**

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36050M05  
Pick up:

**CB: B-MCC 1-BLOWER #6 INLET**

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	GJL (03/1998)	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	GJL (60Hz)	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC 1-EXHAUST 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 26.000 (8 - 28)

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC 1-EXHAUST 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 26.000 (8 - 28)

**CB: B-MCC 1-EXHAUST 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 26.000 (8 - 28)

**CB: B-MCC 1-EXHAUST 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 26.000 (8 - 28)

**CB: B-MCC 1-LP1**

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36030M04  
Pick up: 90.000 (90 - 330)

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC 1-ROLL-UP DOOR

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	GJL (03/1998)	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	GJL (60Hz)	Magnetic Trip:	FIXED
ID:	20		

#### CB: B-MCC 1-SPARE

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	GJL (03/1998)	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	GJL (60Hz)	Magnetic Trip:	FIXED
ID:	20		

#### CB: B-MCC B1-AIR BLOWER

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	10.000
ID:	250		

#### CB: B-MCC B1-AIR COMPRESSOR

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	45	Cont. Amp:	45.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	45		

#### CB: B-MCC B1-AIR COMPRESSOR 2

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	40		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B1-DAF THICK 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC B1-EAST DAF RECYC**

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	10.000
ID:	250		

**CB: B-MCC B1-PNL**

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	40		

**CB: B-MCC B1-PRESSURIZATION**

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	10.000
ID:	250		



Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B1-SUBNATANT**

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B1-THICK WAS 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	60	Cont. Amp:	60.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	60		

**CB: B-MCC B1-THICK WAS 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	60	Cont. Amp:	60.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	60		

**CB: B-MCC B1-WEST DAF RECYC**

MFR:	Square-D*	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	5.000
ID:	250		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B2-AIR COMPRESSOR**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC B2-EQ DIVERSION VLV**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC B2-HOIST**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC B2-PNL LBI**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	14 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B2-PNL P3**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC B2-RETURN SLUDGE 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B2-RETURN SLUDGE 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B2-RETURN SLUDGE 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B2-RETURN SLUDGE 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B2-RETURN SLUDGE 5**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B2-SLUDGE THICKENER**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC B2-SPARE 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B2-SPARE 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC B2-SPARE 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

**CB: B-MCC B2-SPARE 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC B2-SPARE 5**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B2-SPARE 6**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC B2-SPARE 7**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC B2-SPARE 8**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.64	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC B3-PNL LB1**

MFR:	Square-D*	Tag #:		3-Phase kA:	16.60	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.34	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B3-PNL P3**

MFR:	Square-D*	Tag #:		3-Phase kA:	16.60	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.34	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC B3-SPARE 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	16.60	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.34	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B3-SPARE 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	16.60	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.34	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B3-SPARE 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	16.60	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.34	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B3-SPARE 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	16.60	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.34	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B3-SPARE 5**

MFR:	Square-D*	Tag #:		3-Phase kA:	16.60	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.34	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B3-SPARE 6**

MFR:	Square-D*	Tag #:		3-Phase kA:	16.60	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.34	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC B3-SPARE 7**

MFR:	Square-D*	Tag #:		3-Phase kA:	16.60	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.34	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
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 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B3-SPARE 8**

MFR: Square-D	Tag #:	3-Phase kA: 16.60 Asym. (Calc.)
Model: KAL	Rating: 25 kA, 0.48 kV	LG kA: 15.34 Asym. (Calc.)
Size: 200	Cont. Amp: 200.000	Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: KAL	Magnetic Trip: 5.000
ID: 200	

**CB: B-MCC B3-SPARE 9**

MFR: Square-D*	Tag #:	3-Phase kA: 16.60 Asym. (Calc.)
Model: KAL	Rating: 65 kA, 0.48 kV	LG kA: 15.34 Asym. (Calc.)
Size: 250	Cont. Amp: 250.000	Base kV: 0.480 (Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: KAL	Magnetic Trip: 5.000
ID: 250	

**CB: B-MCC B3-STANDBY PRESSURE**

MFR: Square-D*	Tag #:	3-Phase kA: 16.60 Asym. (Calc.)
Model: KAL	Rating: 65 kA, 0.48 kV	LG kA: 15.34 Asym. (Calc.)
Size: 250	Cont. Amp: 250.000	Base kV: 0.480 (Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: KAL	Magnetic Trip: 5.000
ID: 250	

**CB: B-MCC B3-VALVE OP**

MFR: Square-D	Tag #:	3-Phase kA: 16.60 Asym. (Calc.)
Model: FAL 480V	Rating: 18 kA, 0.48 kV	LG kA: 15.34 Asym. (Calc.)
Size: 15	Cont. Amp: 15.000	Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: FAL	Magnetic Trip: FIXED
ID: 15	

**CB: B-MCC B4-ADFV 13**

MFR: Square-D*	Tag #:	3-Phase kA: 15.56 Asym. (Calc.)
Model: FAL 480V	Rating: 65 kA, 0.48 kV	LG kA: 15.53 Asym. (Calc.)
Size: 20	Cont. Amp: 20.000	Base kV: 0.480 (Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: FAL	Magnetic Trip: FIXED
ID: 20	

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B4-ADFV 14**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC B4-ADFV 15**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC B4-ADFV 16**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC B4-EQ TANK RETURN**

MFR:	Square-D	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	18 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B4-PNL LP2**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC B4-SPARE 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B4-SPARE 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B4-SPARE 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B4-SPARE 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B4-SPARE 5**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC B4-SPARE 6**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC B4-SPARE 7**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC B4-SPARE 8**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	5.000
ID:	250		

**CB: B-MCC D1-BFP FEED PUMP**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D1-BFP FEED PUMPS**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D1-GRAVITY THICK**

MFR:	Square-D	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR:	Square D
Model:	GJL
ID:	36003M01
Pick up:	21.000 (9 - 33)

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC D1-PNL. LD

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

#### CB: B-MCC D1-PNL. LD 2

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	40		

#### CB: B-MCC D1-SLUDGE RECIRC 1

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

#### CB: B-MCC D1-SLUDGE RECIRC 3

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC D1-SLUDGE RECIRC 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC D1-SLUDGE TRANSFER1**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FA 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FA	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D1-SODIUM BICARB CP**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC D1-SPARE 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC D1-SPARE 10**

MFR:	Square-D	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36003M01  
Pick up:

**CB: B-MCC D1-SPARE 11**

MFR:	Square-D	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36003M01  
Pick up:

**CB: B-MCC D1-SPARE 2**

MFR:	Square-D	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36003M01  
Pick up:

**CB: B-MCC D1-SPARE 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		



Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC D1-SPARE 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

**CB: B-MCC D1-SPARE 5**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D1-SPARE 6**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D1-SPARE 7**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	100		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC D1-SPARE 8

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	100		

#### CB: B-MCC D1-SPARE 9

MFR:	Square-D	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

#### Motor Circuit Protector Trip Device

MFR: Square D  
Model: GJL  
ID: 36003M01  
Pick up:

#### CB: B-MCC D1-SUPERANANT

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	150	Cont. Amp:	150.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	5.000
ID:	150		

#### CB: B-MCC D1-THICKENER

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	20		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC D2-BFP FEED PUMP1**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D2-BFP FEED PUMP4**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D2-BFP FEED PUMP6**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D2-PNL. LD**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC D2-SLUDGE RECIRC 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D2-SLUDGE TRANSFER2**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC D2-SLUDGE TRANSFER3**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC D2-SLUDGE TRANSFER4**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC D2-SPARE 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D2-SPARE 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC D2-SPARE 3**

MFR:	Square-D	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36003M01  
Pick up:

**CB: B-MCC D2-SPARE 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	20		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC D2-SPARE 5**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC D2-SPARE 6**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC D2-SPARE 7**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC D2-SPARE 8**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	100		

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC D4 MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	14.53	Asym. (Calc.)
Model:	LJ	Rating:	65 kA, 0.48 kV	LG kA:	13.75	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: Micrologic 6.3 A/E (PP)  
 Sensor: 600

Phase Setting

Long-Time	Ir	600 A	tr	16.0
Short-Time	Isd	5.000		
	tsd	0 OFF	I <sup>xt</sup> =OUT	
INST	Ii	11 x In		

**CB: B-MCC D4/D5 TIE**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	LJ	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	400	Cont. Amp:	400.000	Base kV:	0.000	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: Micrologic 6.3 A/E (PP)  
 Sensor: 400

Phase Setting

Long-Time	Ir	400 A	tr	16.0
Short-Time	Isd	5.500		
	tsd	0 OFF	I <sup>xt</sup> =OUT	
INST	Ii	10 x In		

**CB: B-MCC D4-BLOWER 1**

MFR:	Square-D	Tag #:		3-Phase kA:	14.53	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	13.75	Asym. (Calc.)
Size:	150	Cont. Amp:	150.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact J-frame (50Hz)	Magnetic Trip:	10.000
ID:	150		

**CB: B-MCC D4-BLOWER 3**

MFR:	Square-D	Tag #:		3-Phase kA:	14.53	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	13.75	Asym. (Calc.)
Size:	150	Cont. Amp:	150.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact J-frame (50Hz)	Magnetic Trip:	10.000
ID:	150		

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC D4-MTS**

MFR:	Square-D	Tag #:		3-Phase kA:	14.53	Asym. (Calc.)
Model:	HJ	Rating:	65 kA, 0.48 kV	LG kA:	13.75	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact H-frame (60Hz)	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC D4-PMP 1**

MFR:	Square-D	Tag #:		3-Phase kA:	14.53	Asym. (Calc.)
Model:	HJ	Rating:	65 kA, 0.48 kV	LG kA:	13.75	Asym. (Calc.)
Size:	125	Cont. Amp:	125.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact H-frame (60Hz)	Magnetic Trip:	FIXED
ID:	125		

**CB: B-MCC D4-PMP 3**

MFR:	Square-D	Tag #:		3-Phase kA:	14.53	Asym. (Calc.)
Model:	HJ	Rating:	65 kA, 0.48 kV	LG kA:	13.75	Asym. (Calc.)
Size:	125	Cont. Amp:	125.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact H-frame (60Hz)	Magnetic Trip:	FIXED
ID:	125		

**CB: B-MCC D5 MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	14.50	Asym. (Calc.)
Model:	LJ	Rating:	65 kA, 0.48 kV	LG kA:	13.73	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR:	Square-D
Model:	Micrologic 6.3 A/E (PP)
Sensor:	600

Phase Setting

Long-Time	Ir	600 A	tr	16.0
Short-Time	Isd	5.000		
	tsd	0 OFF	I^xt=OUT	
	INST li	11 x In		



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC D5-BLOWER 2**

MFR:	Square-D	Tag #:		3-Phase kA:	14.50	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	13.73	Asym. (Calc.)
Size:	150	Cont. Amp:	150.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact J-frame (50Hz)	Magnetic Trip:	10.000
ID:	150		

**CB: B-MCC D5-BLOWER 4**

MFR:	Square-D	Tag #:		3-Phase kA:	14.50	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	13.73	Asym. (Calc.)
Size:	150	Cont. Amp:	150.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact J-frame (50Hz)	Magnetic Trip:	10.000
ID:	150		

**CB: B-MCC D5-MTS**

MFR:	Square-D	Tag #:		3-Phase kA:	14.50	Asym. (Calc.)
Model:	HJ	Rating:	65 kA, 0.48 kV	LG kA:	13.73	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact H-frame (60Hz)	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC D5-PMP 2**

MFR:	Square-D	Tag #:		3-Phase kA:	14.50	Asym. (Calc.)
Model:	HJ	Rating:	65 kA, 0.48 kV	LG kA:	13.73	Asym. (Calc.)
Size:	125	Cont. Amp:	125.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact H-frame (60Hz)	Magnetic Trip:	FIXED
ID:	125		

**CB: B-MCC D5-PMP 4**

MFR:	Square-D	Tag #:		3-Phase kA:	14.50	Asym. (Calc.)
Model:	HJ	Rating:	65 kA, 0.48 kV	LG kA:	13.73	Asym. (Calc.)
Size:	125	Cont. Amp:	125.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact H-frame (60Hz)	Magnetic Trip:	FIXED
ID:	125		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC DW1-BFP 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.94	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.85	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC DW1-BFP 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.51	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.56	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC DW1-BFP 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.94	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.85	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC DW1-BFP 5**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.94	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.85	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC DW1-BFP 6**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.94	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.85	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC DW1-PLANT DRAIN**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.94	Asym. (Calc.)
Model:	KHL	Rating:	65 kA, 0.48 kV	LG kA:	14.85	Asym. (Calc.)
Size:	150	Cont. Amp:	150.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KHL	Magnetic Trip:	5.000
ID:	150		

**CB: B-MCC DW1-PNL. LDW**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.94	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.85	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

**CB: B-MCC DW1-POLYMER MIX**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.94	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.85	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC DW1-WATER HEATER**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.94	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.85	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC DW2-BFP 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.51	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.56	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC DW2-CONVEYOR CP**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.51	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.56	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

**CB: B-MCC DW2-OLD MAINT.**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.51	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.56	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC DW2-PNL. LDW**

MFR: Square-D*	Tag #:	3-Phase kA: 14.51 Asym. (Calc.)
Model: FAL 480V	Rating: 65 kA, 0.48 kV	LG kA: 14.56 Asym. (Calc.)
Size: 40	Cont. Amp: 40.000	Base kV: 0.480 (Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: FAL	Magnetic Trip: FIXED
ID: 40	

**CB: B-MCC DW2-POLYMER FEED**

MFR: Square-D*	Tag #:	3-Phase kA: 14.51 Asym. (Calc.)
Model: FAL 480V	Rating: 65 kA, 0.48 kV	LG kA: 14.56 Asym. (Calc.)
Size: 30	Cont. Amp: 30.000	Base kV: 0.480 (Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: FAL	Magnetic Trip: FIXED
ID: 30	

**CB: B-MCC DW2-POLYMER FEEDS/6**

MFR: Square-D*	Tag #:	3-Phase kA: 14.51 Asym. (Calc.)
Model: FAL 480V	Rating: 65 kA, 0.48 kV	LG kA: 14.56 Asym. (Calc.)
Size: 35	Cont. Amp: 35.000	Base kV: 0.480 (Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: FAL	Magnetic Trip: FIXED
ID: 35	

**CB: B-MCC DW2-SPARE**

MFR: Square-D*	Tag #:	3-Phase kA: 14.51 Asym. (Calc.)
Model: FAL 480V	Rating: 65 kA, 0.48 kV	LG kA: 14.56 Asym. (Calc.)
Size: 15	Cont. Amp: 15.000	Base kV: 0.480 (Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: FAL	Magnetic Trip: FIXED
ID: 15	

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E1-54" METER VAULT**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC E1-54" METER VAULT1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC E1-ABW 3,4,6 FESTON**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FA 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FA	Magnetic Trip:	FIXED
ID:	40		

**CB: B-MCC E1-EF-1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E1-EF-7**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC E1-EFF. WEIR GATE**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC E1-EFF. WEIR GATE1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC E1-FLASH MIXER 1**

MFR:	Square-D	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR:	Square D
Model:	GJL
ID:	36030M04
Pick up:	330.000 (90 - 330)

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E1-FLASH MIXER 2**

MFR:	Square-D	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36030M04  
Pick up: 330.000 (90 - 330)

**CB: B-MCC E1-FLASH MIXER 3**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.000	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36030M04  
Pick up: 330.000 (90 - 330)

**CB: B-MCC E1-FLASH MIXER 4**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	GJL	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.000	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: GJL  
ID: 36030M04  
Pick up: 330.000 (90 - 330)

**CB: B-MCC E1-INF. WEIR GATE**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		



Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E1-INF. WEIR GATE1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC E1-PNL. DP #1**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	225	Cont. Amp:	225.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	8.000
ID:	225		

**CB: B-MCC E1-PNL. DP #2**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	9.000
ID:	250		

**CB: B-MCC E1-PNL. DP #3**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	10.000
ID:	250		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E1-PNL. DP #4**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	225	Cont. Amp:	225.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	8.000
ID:	225		

**CB: B-MCC E1-PNL. P1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC E1-PNL. P4**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC E1-REUSE LIFT PUMP**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC E1-REUSE LIFT PUMP1

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

#### CB: B-MCC E1-ROOF A/C #1

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

#### CB: B-MCC E1-ROOF A/C #2

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

#### CB: B-MCC E1-SLUICE GATE #1

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E1-SLUICE GATE #4**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC E1-SPARE**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	225	Cont. Amp:	225.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	6.000
ID:	225		

**CB: B-MCC E1-SPARE1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	KAL	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	225	Cont. Amp:	225.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KAL	Magnetic Trip:	6.000
ID:	225		

**CB: B-MCC E2-A/C ROOF UNIT 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC E2-A/C ROOF UNIT 2

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

#### CB: B-MCC E2-ABW #1 SLUICE 1

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

#### CB: B-MCC E2-ABW #1 SLUICE 2

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

#### CB: B-MCC E2-ABW #7 FESTON

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	40		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC E2-ABW #7 FESTON1

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	40		

#### CB: B-MCC E2-ABW 3,4,5 FESTON

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	40		

#### CB: B-MCC E2-ABW 3,4,5 FLOCC

MFR:	Square-D	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL_MCP	Rating:	30 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

#### Motor Circuit Protector Trip Device

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

#### CB: B-MCC E2-ABW 3,4,5 FLOCC1

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL_MCP	Rating:	30 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.000	(Calc.)

#### Motor Circuit Protector Trip Device

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E2-ABW 6,7FLASH MIX**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC E2-ABW FILTER 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

**CB: B-MCC E2-ABW FILTER 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

**CB: B-MCC E2-ABW SLUICE GATE**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC E2-ABW SLUICE GATE1

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

#### CB: B-MCC E2-EF-5.1

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Motor Circuit Protector Trip Device

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

#### CB: B-MCC E2-EF-5.2

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Motor Circuit Protector Trip Device

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

#### CB: B-MCC E2-EF-5.3

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

#### Motor Circuit Protector Trip Device

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)



Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E2-EF-5.4**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

**CB: B-MCC E2-EFF. FILTER PS**

MFR:	Square-D	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	LAL	Rating:	30 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	300	Cont. Amp:	300.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	LAL	Magnetic Trip:	7.500
ID:	300		

**CB: B-MCC E2-EFF. FILTER PS1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	LAL	Rating:	30 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	300	Cont. Amp:	300.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	LAL	Magnetic Trip:	7.500
ID:	300		

**CB: B-MCC E2-MOV RATE**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E2-MOV RATE1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC E2-PNL. DP #1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	LHL	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	LHL	Magnetic Trip:	5.000
ID:	250		

**CB: B-MCC E2-PNL. DP #4**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	LHL	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	LHL	Magnetic Trip:	5.000
ID:	250		

**CB: B-MCC E2-PNL. P1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC E2-PNL. P4

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

#### CB: B-MCC E2-SPARE 1

MFR:		Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:		Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:		Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

#### Motor Circuit Protector Trip Device

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 18.000 (8 - 28)

#### CB: B-MCC E2-SPARE 2

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

#### CB: B-MCC E2-SPARE 3

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E2-SPARE 4**

MFR:	Tag #:	3-Phase kA:	0.00	Asym. (Calc.)
Model:	Rating:	LG kA:	0.00	Asym. (Calc.)
Size:	Cont. Amp:	Base kV:	0.000	(Calc.)

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 18.000 (8 - 28)

**CB: B-MCC E2-SPARE 5**

MFR: Square-D*	Tag #:	3-Phase kA:	15.88	Asym. (Calc.)
Model: FH	Rating:	LG kA:	15.65	Asym. (Calc.)
Size: 20	Cont. Amp:	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip:	Fixed
Model: FH	Magnetic Trip:	FIXED
ID: 20		

**CB: B-MCC E2-SPARE 6**

MFR: Square-D*	Tag #:	3-Phase kA:	15.88	Asym. (Calc.)
Model: FH	Rating:	LG kA:	15.65	Asym. (Calc.)
Size: 20	Cont. Amp:	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip:	Fixed
Model: FH	Magnetic Trip:	FIXED
ID: 20		

**CB: B-MCC E2-SPARE 7**

MFR: Square-D*	Tag #:	3-Phase kA:	0.00	Asym. (Calc.)
Model: FH	Rating:	LG kA:	0.00	Asym. (Calc.)
Size: 20	Cont. Amp:	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip:	Fixed
Model: FH	Magnetic Trip:	FIXED
ID: 20		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC E2-SPARE 8**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC HW1-CONVEYOR EAST**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	7	Cont. Amp:	7.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600712M  
Pick up: 70.000 (18 - 70)

**CB: B-MCC HW1-FINAL CLAR. 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

**CB: B-MCC HW1-FINAL CLAR. 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC HW1-GRIT CLASS WEST**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC HW1-MAIN GATE**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC HW1-MECH SCREEN**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC HW1-PNL LHW**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC HW1-PRI. SLUDGE**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC HW1-RSP 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC HW1-RSP 5**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC HW1-SCUM EJECTOR**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC HW1-SPARE 1

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

#### CB: B-MCC HW1-SPARE 2

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	20		

#### CB: B-MCC HW1-SPARE 3

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

#### CB: B-MCC HW1-SPARE 4

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Motor Circuit Protector Trip Device

MFR:	Square D
Model:	FAL
ID:	3600311M
Pick up:	28.000 (8 - 28)



Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC HW1-SPARE 5**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

**CB: B-MCC HW1-SPARE 6**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC HW1-SPARE 7**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC HW1-SPARE 8**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC HW1-SPARE 9

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

#### CB: B-MCC HW1-WEST CONVEYOR

MFR:	Square-D*	Tag #:		3-Phase kA:	15.88	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	15.65	Asym. (Calc.)
Size:	7	Cont. Amp:	7.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Motor Circuit Protector Trip Device

MFR:	Square D
Model:	FAL
ID:	3600712M
Pick up:	70.000 (18 - 70)

#### CB: B-MCC HW2-DAVIS SCRUBBER

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

#### CB: B-MCC HW2-DEGRITTER CP

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC HW2-GRIT CLASS 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC HW2-GRIT PUMP 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC HW2-PNL LHW**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC HW2-PRI. SLUDGE 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC HW2-PRI. SLUDGE 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC HW2-RSP 6**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC HW2-SEC CLARIFIER**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

**CB: B-MCC HW2-SPARE 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC HW2-SPARE 10**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC HW2-SPARE 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	50	Cont. Amp:	50.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	50		

**CB: B-MCC HW2-SPARE 3**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR:	Square D
Model:	FAL
ID:	3600311M
Pick up:	28.000 (8 - 28)

**CB: B-MCC HW2-SPARE 4**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR:	Square D
Model:	FAL
ID:	3600311M
Pick up:	28.000 (8 - 28)

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC HW2-SPARE 5**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

**CB: B-MCC HW2-SPARE 6**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL_MCP	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	3	Cont. Amp:	3.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Motor Circuit Protector Trip Device**

MFR: Square D  
Model: FAL  
ID: 3600311M  
Pick up: 28.000 (8 - 28)

**CB: B-MCC HW2-SPARE 7**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	100		

**CB: B-MCC HW2-SPARE 8**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCC HW2-SPARE 9

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

#### CB: B-MCC HW2-WAS PUMP 3

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	14 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

#### CB: B-MCC HW2-WAS PUMP 4

MFR:	Square-D*	Tag #:		3-Phase kA:	15.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	14 kA, 0.48 kV	LG kA:	14.81	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

#### CB: B-MCCB2-PNL XFMR

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	QO	Rating:	10 kA, 0.24 kV	LG kA:	0.00	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.000	(Calc.)

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	QO	Magnetic Trip:	FIXED
ID:	40		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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### Protective Device Settings

#### CB: B-MCCB4-SUBM PUMP START

MFR:	Square-D*	Tag #:		3-Phase kA:	15.56	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	15.53	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	30		

#### CB: B-MCC-E1 ABW #1 FESTON

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	60	Cont. Amp:	60.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	60		

#### CB: B-MCC-E1 ABW #1 FESTON1

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	60	Cont. Amp:	60.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	60		

#### CB: B-MCC-E1 ABW #5 SLUICE

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

#### Thermal Magnetic Trip Device

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		



Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC-E1 ABW #5 SLUICE1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC-E1 ABW #6 FESTON**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	40		

**CB: B-MCC-E1 ABW #6 FESTON1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FHL	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FHL	Magnetic Trip:	FIXED
ID:	40		

**CB: B-MCC-E1 ABW #6 SLUICE**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC-E1 ABW #6 SLUICE1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FH	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FH	Magnetic Trip:	FIXED
ID:	20		

**CB: B-MCC-E1 ABW 3,5,6 SLUICE**

MFR:	Square-D*	Tag #:		3-Phase kA:	15.17	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC-E2 ABW #3 FESTON**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

**CB: B-MCC-E2 ABW #3 FESTON1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-MCC-E2-PLANT DRAIN PS**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	KH	Rating:	45 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	200	Cont. Amp:	200.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KH	Magnetic Trip:	5.000
ID:	200		

**CB: B-MCC-E2-PLANT DRAIN PS1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	KH	Rating:	45 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	200	Cont. Amp:	200.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KH	Magnetic Trip:	5.000
ID:	200		

**CB: B-MCC-E2-SLUICE GATE 1**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: B-MCC-E2-SLUICE GATE 2**

MFR:	Square-D*	Tag #:		3-Phase kA:	14.85	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	13.94	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-PNL P3**

MFR:	Square-D*	Tag #:		3-Phase kA:	12.13	Asym. (Calc.)
Model:	Q2	Rating:	10 kA, 0.48 kV	LG kA:	10.74	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Q2	Magnetic Trip:	FIXED
ID:	100		

**CB: B-PNL P3-EVAP. 1**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	QO	Rating:	10 kA, 0.24 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	QO	Magnetic Trip:	FIXED
ID:	20		

**CB: B-PNL P3-EVAP. 2**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	QO	Rating:	10 kA, 0.24 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	QO	Magnetic Trip:	FIXED
ID:	20		

**CB: B-PNL P3-HOIST**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	QO	Rating:	10 kA, 0.24 kV	LG kA:	0.00	Asym. (Calc.)
Size:	20	Cont. Amp:	20.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	QO	Magnetic Trip:	FIXED
ID:	20		

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB 11-SWBD 11**

MFR:	Square-D	Tag #:		3-Phase kA:	19.09	Asym. (Calc.)
Model:	RJF	Rating:	65 kA, 0.48 kV	LG kA:	18.79	Asym. (Calc.)
Size:	1200	Cont. Amp:	1200.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: ET1.0I (RJ)  
 Sensor: 1200

Phase Setting

Long-Time	LT Pickup	fixed	LT Band	Fixed
INST	Inst. Pickup	4		

**CB: B-SUB 12-SWBD 12**

MFR:	Square-D	Tag #:		3-Phase kA:	21.41	Asym. (Calc.)
Model:	RJF	Rating:	65 kA, 0.48 kV	LG kA:	20.22	Asym. (Calc.)
Size:	1200	Cont. Amp:	1200.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: ET1.0I (RJ)  
 Sensor: 1200

Phase Setting

Long-Time	LT Pickup	fixed	LT Band	Fixed
INST	Inst. Pickup	4		

**CB: B-SUB10-DEEP WELL 3 VFD**

MFR:	ABB	Tag #:		3-Phase kA:	21.29	Asym. (Calc.)
Model:	S6N	Rating:	50 kA, 0.48 kV	LG kA:	19.45	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: ABB  
 Model: SACE PR211  
 Sensor: 600

Phase Setting

Long-Time	LT Pickup	1.0
	LT Band	Curve B
INST	Inst. Pickup	4

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB10-DEEP WELL PUMP 2**

MFR:	General Electric	Tag #:		3-Phase kA:	22.26	Asym. (Calc.)
Model:	TP8	Rating:	65 kA, 0.48 kV	LG kA:	21.01	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: General Electric  
 Model: RMS-9 (ICCB, MCCB)  
 Sensor: 800 (LSIG)  
 Rating Plug: 800.00

<u>Phase Setting</u>			<u>Ground Setting</u>		
Long-Time	LT Pickup	1.0	Ground Pickup	0.3	
	LT Band	2	Ground Band	Int	I^xt=OUT
Short-Time	ST Pickup	4.0			
	ST Band	Min			I^xt=OUT
INST	Inst. Pickup	15			

**CB: B-SUB10-DEEP WELL PUMP 3**

MFR:	General Electric	Tag #:		3-Phase kA:	22.26	Asym. (Calc.)
Model:	TP8	Rating:	65 kA, 0.48 kV	LG kA:	21.01	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: General Electric  
 Model: RMS-9 (ICCB, MCCB)  
 Sensor: 800 (LSIG)  
 Rating Plug: 800.00

<u>Phase Setting</u>			<u>Ground Setting</u>		
Long-Time	LT Pickup	1.0	Ground Pickup	0.4	
	LT Band	1	Ground Band	Int	I^xt=OUT
Short-Time	ST Pickup	3.0			
	ST Band	Min			I^xt=OUT
INST	Inst. Pickup	15			

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB10-MAIN**

MFR:	General Electric	Tag #:		3-Phase kA:	22.26	Asym. (Calc.)
Model:	TP16	Rating:	65 kA, 0.48 kV	LG kA:	21.01	Asym. (Calc.)
Size:	1600	Cont. Amp:	1600.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: General Electric  
 Model: RMS-9 (ICCB, MCCB)  
 Sensor: 1600 (LSIG)  
 Rating Plug: 1600.00

<u>Phase Setting</u>			<u>Ground Setting</u>		
Long-Time	LT Pickup	0.9	Ground Pickup	0.2	
	LT Band	1	Ground Band	Int	I <sup>xt</sup> =OUT
Short-Time	ST Pickup	2.5			
	ST Band	Int			
	INST Inst. Pickup	15			

**CB: B-SUB10-PNL PP-201**

MFR:	Square-D	Tag #:		3-Phase kA:	22.26	Asym. (Calc.)
Model:	PJA	Rating:	65 kA, 0.48 kV	LG kA:	21.01	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: ET1.0I (PJ)  
 Sensor: 250

<u>Phase Setting</u>				
Long-Time	LT Pickup	fixed	LT Band	Fixed
	INST Inst. Pickup	2		

**CB: B-SUB10-PNL PP-301**

MFR:	Square-D	Tag #:		3-Phase kA:	22.26	Asym. (Calc.)
Model:	PJA	Rating:	65 kA, 0.48 kV	LG kA:	21.01	Asym. (Calc.)
Size:	400	Cont. Amp:	400.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: ET1.0I (PJ)  
 Sensor: 400

<u>Phase Setting</u>				
Long-Time	LT Pickup	fixed	LT Band	Fixed
	INST Inst. Pickup	2		

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB1-MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	17.77	Asym. (Calc.)
Model:	PEF	Rating:	100 kA, 0.48 kV	LG kA:	18.03	Asym. (Calc.)
Size:	1200	Cont. Amp:	1200.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC Full-PE (Series 4)  
 Sensor: 1200  
 Rating Plug: 1200.00

Phase Setting

Long-Time	LT Pickup	.6P
	LT Band	1
INST	Inst. Pickup	3P

Ground Setting

Ground Pickup	.3S
Ground Band	3 I^xt=OUT

**CB: B-SUB1-MCC E1**

MFR:	Square-D	Tag #:		3-Phase kA:	17.77	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	18.03	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	800		

**CB: B-SUB1-PNL DEEP WELL**

MFR:	Square-D	Tag #:		3-Phase kA:	17.77	Asym. (Calc.)
Model:	FC	Rating:	65 kA, 0.48 kV	LG kA:	18.03	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FC	Magnetic Trip:	FIXED
ID:	100		

**CB: B-SUB1-PNL L1**

MFR:	Square-D	Tag #:		3-Phase kA:	17.77	Asym. (Calc.)
Model:	KA	Rating:	25 kA, 0.48 kV	LG kA:	18.03	Asym. (Calc.)
Size:	125	Cont. Amp:	125.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KA	Magnetic Trip:	5.000
ID:	125		



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB1-PNL P1**

MFR: Square-D	Tag #:	3-Phase kA: 17.77 Asym. (Calc.)
Model: KA	Rating: 25 kA, 0.48 kV	LG kA: 18.03 Asym. (Calc.)
Size: 150	Cont. Amp: 150.000	Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: KA	Magnetic Trip: 5.000
ID: 150	

**CB: B-SUB1-TIE**

MFR: Square-D*	Tag #:	3-Phase kA: 0.00 Asym. (Calc.)
Model: ME	Rating: 50 kA, 0.48 kV	LG kA: 0.00 Asym. (Calc.)
Size: 800	Cont. Amp: 800.000	Base kV: 0.000 (Calc.)

\* The retrieved library data is modified by user.

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC Full-ME (Series 3)  
 Sensor: 800  
 Rating Plug: 600.00

Phase Setting

Long-Time	LT Pickup	1.0P
	LT Band	1
INST	Inst. Pickup	2P

**CB: B-SUB2-MAIN**

MFR: Square-D	Tag #:	3-Phase kA: 17.26 Asym. (Calc.)
Model: PEF	Rating: 100 kA, 0.48 kV	LG kA: 17.68 Asym. (Calc.)
Size: 1200	Cont. Amp: 1200.000	Base kV: 0.480 (Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC Full-PE (Series 4)  
 Sensor: 1200  
 Rating Plug: 1200.00

Phase Setting

Long-Time	LT Pickup	.6P
	LT Band	1
INST	Inst. Pickup	3P

Ground Setting

Ground Pickup	.3S
Ground Band	3 I <sup>xt</sup> =OUT

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB2-MCC E2**

MFR:	Square-D*	Tag #:		3-Phase kA:	17.26	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	17.68	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	800		

**CB: B-SUB2-PNL CP**

MFR:	Square-D	Tag #:		3-Phase kA:	17.26	Asym. (Calc.)
Model:	FC	Rating:	65 kA, 0.48 kV	LG kA:	17.68	Asym. (Calc.)
Size:	30	Cont. Amp:	30.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FC	Magnetic Trip:	FIXED
ID:	30		

**CB: B-SUB2-PNL CP (2)**

MFR:	Square-D	Tag #:		3-Phase kA:	1.29	Asym. (Calc.)
Model:	FAL 480V	Rating:	18 kA, 0.48 kV	LG kA:	1.38	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.208	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	40		

**CB: B-SUB2-PNL L1**

MFR:	Square-D	Tag #:		3-Phase kA:	17.26	Asym. (Calc.)
Model:	KA	Rating:	25 kA, 0.48 kV	LG kA:	17.68	Asym. (Calc.)
Size:	125	Cont. Amp:	125.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KA	Magnetic Trip:	5.000
ID:	125		

**CB: B-SUB2-PNL P1**

MFR:	Square-D	Tag #:		3-Phase kA:	17.26	Asym. (Calc.)
Model:	KA	Rating:	25 kA, 0.48 kV	LG kA:	17.68	Asym. (Calc.)
Size:	150	Cont. Amp:	150.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KA	Magnetic Trip:	5.000
ID:	150		

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB2-SPARE**

MFR: Square-D	Tag #:	3-Phase kA: 17.26 Asym. (Calc.)
Model: MA	Rating: 30 kA, 0.48 kV	LG kA: 17.68 Asym. (Calc.)
Size: 400	Cont. Amp: 400.000	Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: MA	Magnetic Trip: 5.000
ID: 400	

**CB: B-SUB3-MAIN**

MFR: Square-D	Tag #:	3-Phase kA: 16.98 Asym. (Calc.)
Model: PEF	Rating: 100 kA, 0.48 kV	LG kA: 17.48 Asym. (Calc.)
Size: 1200	Cont. Amp: 1200.000	Base kV: 0.480 (Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC Full-PE (Series 4)  
 Sensor: 1200  
 Rating Plug: 1200.00

Phase Setting

Long-Time	LT Pickup	.6P
	LT Band	1
INST	Inst. Pickup	3P

Ground Setting

Ground Pickup	.35S
Ground Band	1 I'xt=OUT

**CB: B-SUB3-MCC HW1**

MFR: Square-D	Tag #:	3-Phase kA: 16.98 Asym. (Calc.)
Model: MA	Rating: 30 kA, 0.48 kV	LG kA: 17.48 Asym. (Calc.)
Size: 800	Cont. Amp: 800.000	Base kV: 0.480 (Calc.)

**Thermal Magnetic Trip Device**

MFR: Square-D	Thermal Trip: Fixed
Model: MA	Magnetic Trip: 5.000
ID: 800	

**CB: B-SUB3-TIE**

MFR: Square-D*	Tag #:	3-Phase kA: 0.00 Asym. (Calc.)
Model: ME	Rating: 50 kA, 0.48 kV	LG kA: 0.00 Asym. (Calc.)
Size: 800	Cont. Amp: 800.000	Base kV: 0.000 (Calc.)

\* The retrieved library data is modified by user.

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC Full-ME (Series 3)  
 Sensor: 800  
 Rating Plug: 600.00

Phase Setting

Long-Time	LT Pickup	1.0P
	LT Band	5
INST	Inst. Pickup	7P

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB4-MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	16.87	Asym. (Calc.)
Model:	PEF	Rating:	100 kA, 0.48 kV	LG kA:	17.40	Asym. (Calc.)
Size:	1200	Cont. Amp:	1200.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC Full-PE (Series 4)  
 Sensor: 1200  
 Rating Plug: 1200.00

Phase Setting

Long-Time	LT Pickup	.6P
	LT Band	1
INST	Inst. Pickup	3P

Ground Setting

Ground Pickup	.3S	
Ground Band	3	I <sup>xt</sup> =OUT

**CB: B-SUB4-MCC HW2**

MFR:	Square-D	Tag #:		3-Phase kA:	16.87	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	17.40	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	800		

**CB: B-SUB5-MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	16.52	Asym. (Calc.)
Model:	PEF	Rating:	100 kA, 0.48 kV	LG kA:	17.15	Asym. (Calc.)
Size:	1200	Cont. Amp:	1200.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC Full-PE (Series 4)  
 Sensor: 1200  
 Rating Plug: 1200.00

Phase Setting

Long-Time	LT Pickup	.6P
	LT Band	1
INST	Inst. Pickup	4P

Ground Setting

Ground Pickup	.3S	
Ground Band	3	I <sup>xt</sup> =OUT

**CB: B-SUB5-MCC B2**

MFR:	Square-D	Tag #:		3-Phase kA:	16.52	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	17.15	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	600		

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB5-MCC B4**

MFR:	Square-D	Tag #:		3-Phase kA:	16.52	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	17.15	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	600		

**CB: B-SUB5-SPARE**

MFR:	Square-D	Tag #:		3-Phase kA:	16.52	Asym. (Calc.)
Model:	KA	Rating:	25 kA, 0.48 kV	LG kA:	17.15	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KA	Magnetic Trip:	5.000
ID:	250		

**CB: B-SUB6-MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	18.84	Asym. (Calc.)
Model:	PEF	Rating:	100 kA, 0.48 kV	LG kA:	18.75	Asym. (Calc.)
Size:	1200	Cont. Amp:	1200.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC Full-PE (Series 4)  
 Sensor: 1200  
 Rating Plug: 1200.00

<u>Phase Setting</u>			<u>Ground Setting</u>		
Long-Time	LT Pickup	.6P	Ground Pickup	.4S	
	LT Band	1	Ground Band	1	I <sup>xt</sup> =OUT
	INST Inst. Pickup	2P			

**CB: B-SUB6-MCC 1**

MFR:	Square-D	Tag #:		3-Phase kA:	18.84	Asym. (Calc.)
Model:	LA	Rating:	30 kA, 0.48 kV	LG kA:	18.75	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	LA	Magnetic Trip:	10.000
ID:	250		

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB6-MCC B1**

MFR:	Square-D	Tag #:		3-Phase kA:	18.84	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	18.75	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	600		

**CB: B-SUB6-MCC B3**

MFR:	Square-D	Tag #:		3-Phase kA:	18.84	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	18.75	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	600		

**CB: B-SUB6-SPARE**

MFR:	Square-D	Tag #:		3-Phase kA:	18.84	Asym. (Calc.)
Model:	LA	Rating:	30 kA, 0.48 kV	LG kA:	18.75	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	LA	Magnetic Trip:	10.000
ID:	250		

**CB: B-SUB6-TIE**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	ME	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.000	(Calc.)

**LV Solid State Trip Device**

MFR:	Square-D
Model:	MICROLOGIC Full-ME (Series 3)
Sensor:	800
Rating Plug:	600.00

Phase Setting

Long-Time	LT Pickup	1.0P
	LT Band	1
INST	Inst. Pickup	2P

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SUB7-MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	15.63	Asym. (Calc.)
Model:	PEF	Rating:	100 kA, 0.48 kV	LG kA:	16.50	Asym. (Calc.)
Size:	1200	Cont. Amp:	1200.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC Full-PE (Series 4)  
 Sensor: 1200  
 Rating Plug: 1200.00

Phase Setting

Long-Time	LT Pickup	.6P
	LT Band	1
INST	Inst. Pickup	4P

Ground Setting

Ground Pickup	.4S
Ground Band	1 I^xt=OUT

**CB: B-SUB7-MCC D2**

MFR:	Square-D	Tag #:		3-Phase kA:	15.63	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	16.50	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	600		

**CB: B-SUB7-MCC DW2**

MFR:	Square-D	Tag #:		3-Phase kA:	15.63	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	16.50	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	600		

**CB: B-SUB7-TIE**

MFR:	Square-D	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.000	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	10.000
ID:	600		

Project: MANATEE COUNTY ESS  
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 Engineer: KTW  
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**Protective Device Settings**

**CB: B-SUB8-MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	16.07	Asym. (Calc.)
Model:	PEF	Rating:	100 kA, 0.48 kV	LG kA:	16.82	Asym. (Calc.)
Size:	1200	Cont. Amp:	1200.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC Full-PE (Series 4)  
 Sensor: 1200  
 Rating Plug: 1200.00

Phase Setting

Long-Time	LT Pickup	.6P
	LT Band	1
INST	Inst. Pickup	2P

Ground Setting

Ground Pickup	.4S
Ground Band	1 I^xt=OUT

**CB: B-SUB8-MCC D1**

MFR:	Square-D	Tag #:		3-Phase kA:	16.07	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	16.82	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	600		

**CB: B-SUB8-MCC DW1**

MFR:	Square-D	Tag #:		3-Phase kA:	16.07	Asym. (Calc.)
Model:	MA	Rating:	30 kA, 0.48 kV	LG kA:	16.82	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MA	Magnetic Trip:	5.000
ID:	600		

**CB: B-SUB8-NEW MAINT. BLDG**

MFR:	Square-D	Tag #:		3-Phase kA:	16.07	Asym. (Calc.)
Model:	JJ	Rating:	65 kA, 0.48 kV	LG kA:	16.82	Asym. (Calc.)
Size:	250	Cont. Amp:	250.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	Powerpact J-frame (60Hz)	Magnetic Trip:	5.000
ID:	250		



Project: MANATEE COUNTY ESS  
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**Protective Device Settings**

**CB: B-SUB9/10-DEEP WELL 2 VFD**

MFR:	ABB	Tag #:		3-Phase kA:	19.63	Asym. (Calc.)
Model:	S6N	Rating:	50 kA, 0.48 kV	LG kA:	17.01	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: ABB  
 Model: SACE PR211  
 Sensor: 600

Phase Setting

Long-Time	LT Pickup	1.0
	LT Band	Curve B
INST	Inst. Pickup	4

**CB: B-SUB9-DEEP WELL 1 VFD**

MFR:	ABB	Tag #:		3-Phase kA:	18.70	Asym. (Calc.)
Model:	S6N	Rating:	50 kA, 0.48 kV	LG kA:	17.56	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: ABB  
 Model: SACE PR211  
 Sensor: 600

Phase Setting

Long-Time	LT Pickup	1.0
	LT Band	Curve A
INST	Inst. Pickup	4

**CB: B-SUB9-DEEP WELL PUMP 1**

MFR:	General Electric	Tag #:		3-Phase kA:	19.78	Asym. (Calc.)
Model:	TP8	Rating:	65 kA, 0.48 kV	LG kA:	19.47	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: General Electric  
 Model: RMS-9 (ICCB, MCCB)  
 Sensor: 800 (LSIG)  
 Rating Plug: 600.00

Phase Setting

Ground Setting

Long-Time	LT Pickup	1.0		Ground Pickup	0.3
	LT Band	1		Ground Band	Int I <sup>xt</sup> =OUT
Short-Time	ST Pickup	4.0			
	ST Band	Min	I <sup>xt</sup> =OUT		
INST	Inst. Pickup	15			

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
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**Protective Device Settings**

**CB: B-SUB9-DEEP WELL PUMP 2**

MFR:	General Electric	Tag #:		3-Phase kA:	19.78	Asym. (Calc.)
Model:	TP8	Rating:	65 kA, 0.48 kV	LG kA:	19.47	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: General Electric  
 Model: RMS-9 (ICCB, MCCB)  
 Sensor: 800 (LSIG)  
 Rating Plug: 600.00

<u>Phase Setting</u>			<u>Ground Setting</u>		
Long-Time	LT Pickup	1.0	Ground Pickup	0.3	
	LT Band	2	Ground Band	Int	I <sup>xt</sup> =OUT
Short-Time	ST Pickup	7.0			
	ST Band	Min			I <sup>xt</sup> =OUT
	INST Inst. Pickup	15			

**CB: B-SUB9-MAIN**

MFR:	General Electric	Tag #:		3-Phase kA:	19.78	Asym. (Calc.)
Model:	TP16	Rating:	65 kA, 0.48 kV	LG kA:	19.47	Asym. (Calc.)
Size:	1600	Cont. Amp:	1600.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: General Electric  
 Model: RMS-9 (ICCB, MCCB)  
 Sensor: 1600 (LSIG)  
 Rating Plug: 1200.00

<u>Phase Setting</u>			<u>Ground Setting</u>		
Long-Time	LT Pickup	0.9	Ground Pickup	0.2	
	LT Band	1	Ground Band	Int	I <sup>xt</sup> =OUT
Short-Time	ST Pickup	3.0			
	ST Band	Int			I <sup>xt</sup> =OUT
	INST Inst. Pickup	15			

**CB: B-SWBD11-DEEP WELL 4 VFD**

MFR:	ABB	Tag #:		3-Phase kA:	16.39	Asym. (Calc.)
Model:	S6N	Rating:	50 kA, 0.48 kV	LG kA:	14.37	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: ABB  
 Model: SACE PR211  
 Sensor: 600

<u>Phase Setting</u>		
Long-Time	LT Pickup	1.0
	LT Band	Curve D
	INST Inst. Pickup	2

Project: MANATEE COUNTY ESS  
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 Engineer: KTW  
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**Protective Device Settings**

**CB: B-SWBD11-DEEP WELL PUMP 4**

MFR:	Square-D	Tag #:		3-Phase kA:	17.03	Asym. (Calc.)
Model:	PJA	Rating:	65 kA, 0.48 kV	LG kA:	15.33	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC 5.0  
 Sensor: 800

Phase Setting

Long-Time	LT Pickup	1	LT Band	16
Short-Time	ST Pickup	8		
	ST Band	0.3	I <sup>xt</sup> =OUT	
INST	Inst. Pickup	2		

**CB: B-SWBD11-DEEP WELL PUMP 5**

MFR:	Square-D	Tag #:		3-Phase kA:	17.03	Asym. (Calc.)
Model:	PJA	Rating:	65 kA, 0.48 kV	LG kA:	15.33	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: MICROLOGIC 5.0  
 Sensor: 800

Phase Setting

Long-Time	LT Pickup	1	LT Band	0.5
Short-Time	ST Pickup	1.5		
	ST Band	0.1	I <sup>xt</sup> =OUT	
INST	Inst. Pickup	2		

**CB: B-SWBD11-MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	17.03	Asym. (Calc.)
Model:	RJF	Rating:	65 kA, 0.48 kV	LG kA:	15.33	Asym. (Calc.)
Size:	1200	Cont. Amp:	1200.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
 Model: ET1.0I (RJ)  
 Sensor: 1200

Phase Setting

Long-Time	LT Pickup	fixed	LT Band	Fixed
INST	Inst. Pickup	2		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
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**Protective Device Settings**

**CB: B-SWBD11-SPARE1**

MFR:	Square-D	Tag #:		3-Phase kA:	17.03	Asym. (Calc.)
Model:	FA 480V	Rating:	18 kA, 0.48 kV	LG kA:	15.33	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FA	Magnetic Trip:	FIXED
ID:	100		

**CB: B-SWBD11-SPARE2**

MFR:	Square-D	Tag #:		3-Phase kA:	17.03	Asym. (Calc.)
Model:	FA 480V	Rating:	18 kA, 0.48 kV	LG kA:	15.33	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FA	Magnetic Trip:	FIXED
ID:	100		

**CB: B-SWBD11-SPARE3**

MFR:	Square-D	Tag #:		3-Phase kA:	17.03	Asym. (Calc.)
Model:	FA 480V	Rating:	18 kA, 0.48 kV	LG kA:	15.33	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FA	Magnetic Trip:	FIXED
ID:	100		

**CB: B-SWBD11-SPARE4**

MFR:	Square-D	Tag #:		3-Phase kA:	19.55	Asym. (Calc.)
Model:	FA 480V	Rating:	18 kA, 0.48 kV	LG kA:	16.74	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FA	Magnetic Trip:	FIXED
ID:	100		

**CB: B-SWBD11-SPARE5**

MFR:	Square-D	Tag #:		3-Phase kA:	19.55	Asym. (Calc.)
Model:	FA 480V	Rating:	18 kA, 0.48 kV	LG kA:	16.74	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FA	Magnetic Trip:	FIXED
ID:	100		

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SWBD11-SPARE6**

MFR:	Square-D	Tag #:		3-Phase kA:	19.55	Asym. (Calc.)
Model:	FA 480V	Rating:	18 kA, 0.48 kV	LG kA:	16.74	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FA	Magnetic Trip:	FIXED
ID:	100		

**CB: B-SWBD11-SPARE7**

MFR:	Square-D	Tag #:		3-Phase kA:	19.55	Asym. (Calc.)
Model:	FA 480V	Rating:	18 kA, 0.48 kV	LG kA:	16.74	Asym. (Calc.)
Size:	100	Cont. Amp:	100.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FA	Magnetic Trip:	FIXED
ID:	100		

**CB: B-SWBD12-DEEP WELL 6 VFD**

MFR:	ABB	Tag #:		3-Phase kA:	18.67	Asym. (Calc.)
Model:	S6N	Rating:	50 kA, 0.48 kV	LG kA:	15.58	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR:	ABB
Model:	SACE PR211
Sensor:	600

Phase Setting

Long-Time	LT Pickup	1.0	
	LT Band	Curve D	
INST	Inst. Pickup	2	

**CB: B-SWBD12-DEEP WELL PUMP 5**

MFR:	Square-D	Tag #:		3-Phase kA:	19.55	Asym. (Calc.)
Model:	PJA	Rating:	65 kA, 0.48 kV	LG kA:	16.74	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

**LV Solid State Trip Device**

MFR:	Square-D
Model:	MICROLOGIC 5.0
Sensor:	800

Phase Setting

Long-Time	LT Pickup	1	LT Band	12
Short-Time	ST Pickup	8		
	ST Band	0.3	I <sup>xt</sup> =OUT	
INST	Inst. Pickup	4		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: B-SWB12-DEEP WELL PUMP 6**

MFR: Square-D Tag #: 3-Phase kA: 19.55 Asym. (Calc.)  
Model: PJA Rating: 65 kA, 0.48 kV LG kA: 16.74 Asym. (Calc.)  
Size: 800 Cont. Amp: 800.000 Base kV: 0.480 (Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
Model: MICROLOGIC 5.0  
Sensor: 800

Phase Setting

Long-Time	LT Pickup	1	LT Band	16
Short-Time	ST Pickup	8		
	ST Band	0.3	I <sup>xt</sup> =OUT	
INST	Inst. Pickup	2		

**CB: B-SWB12-MAIN**

MFR: Square-D Tag #: 3-Phase kA: 19.55 Asym. (Calc.)  
Model: RJF Rating: 65 kA, 0.48 kV LG kA: 16.74 Asym. (Calc.)  
Size: 1200 Cont. Amp: 1200.000 Base kV: 0.480 (Calc.)

**LV Solid State Trip Device**

MFR: Square-D  
Model: ET1.0I (RJ)  
Sensor: 1200

Phase Setting

Long-Time	LT Pickup	fixed	LT Band	Fixed
INST	Inst. Pickup	2		

**CB: CB1**

MFR: Square-D\* Tag #: 3-Phase kA: 0.00 Asym. (Calc.)  
Model: FHL Rating: 65 kA, 0.48 kV LG kA: 0.00 Asym. (Calc.)  
Size: 40 Cont. Amp: 40.000 Base kV: 0.000 (Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: FHL Magnetic Trip: FIXED  
ID: 40

**CB: CB2**

MFR: Square-D\* Tag #: 3-Phase kA: 0.00 Asym. (Calc.)  
Model: FAL 480V Rating: 65 kA, 0.48 kV LG kA: 0.00 Asym. (Calc.)  
Size: 30 Cont. Amp: 30.000 Base kV: 0.000 (Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR: Square-D Thermal Trip: Fixed  
Model: FAL Magnetic Trip: FIXED  
ID: 30

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: CB3**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FAL 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	15	Cont. Amp:	15.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FAL	Magnetic Trip:	FIXED
ID:	15		

**CB: CB4**

MFR:	Square-D*	Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:	FA 480V	Rating:	65 kA, 0.48 kV	LG kA:	0.00	Asym. (Calc.)
Size:	40	Cont. Amp:	40.000	Base kV:	0.000	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	FA	Magnetic Trip:	FIXED
ID:	40		

**CB: CB5**

MFR:		Tag #:		3-Phase kA:	0.00	Asym. (Calc.)
Model:		Rating:	0 kA, 0 kV	LG kA:	0.00	Asym. (Calc.)
Size:		Cont. Amp:	0.000	Base kV:	0.000	(Calc.)

**CB: MCC 1-MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	7.41	Asym. (Calc.)
Model:	KC	Rating:	65 kA, 0.48 kV	LG kA:	5.45	Asym. (Calc.)
Size:	150	Cont. Amp:	150.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	KC	Magnetic Trip:	5.000
ID:	150		

**CB: MCC B1-MAIN**

MFR:	Square-D	Tag #:		3-Phase kA:	17.36	Asym. (Calc.)
Model:	MHL	Rating:	65 kA, 0.48 kV	LG kA:	16.05	Asym. (Calc.)
Size:	600	Cont. Amp:	600.000	Base kV:	0.480	(Calc.)

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MHL	Magnetic Trip:	5.000
ID:	600		

Project: MANATEE COUNTY ESS  
Location: SWWRF  
Contract: 8910V.00  
Engineer: KTW  
Filename: Alternate SWWRF model

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**Protective Device Settings**

**CB: MCC D1 MAIN**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.38	Asym. (Calc.)
Model:	MAL	Rating:	65 kA, 0.48 kV	LG kA:	8.66	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MAL	Magnetic Trip:	5.000
ID:	800		

**CB: MCC D2 MAIN**

MFR:	Square-D*	Tag #:		3-Phase kA:	10.09	Asym. (Calc.)
Model:	MAL	Rating:	65 kA, 0.48 kV	LG kA:	8.48	Asym. (Calc.)
Size:	800	Cont. Amp:	800.000	Base kV:	0.480	(Calc.)

\* The retrieved library data is modified by user.

**Thermal Magnetic Trip Device**

MFR:	Square-D	Thermal Trip:	Fixed
Model:	MAL	Magnetic Trip:	5.000
ID:	800		



**APPENDIX F – EQUIPMENT DATA**

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: SWWRF

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**Transformer Schedule**

**2-Winding Transformer**

Transformer ID	Status	Rating					% Tap Setting		
		kVA	Prim. kV	Sec. kV	% Z	X/R	% Tol.	Pri.	Sec.
FPL XFMR 1	De-energized	1500	23.000	4.160	5.1	7.10	0.0	0.000	0.000
FPL XFMR 2	De-energized	1500	23.000	4.160	5.1	7.10	0.0	0.000	0.000
FPL XFMR 3	De-energized	1500	23.000	4.160	5.1	7.10	0.0	0.000	0.000
SUB 1 XFMR	Energized	500	4.160	0.480	4.0	4.70	0.0	0.000	0.000
SUB 10 XFMR	Energized	750	4.160	0.480	5.9	4.70	0.0	0.000	0.000
SUB 2 XFMR	Energized	500	4.160	0.480	4.0	4.70	0.0	0.000	0.000
SUB 3 XFMR	Energized	500	4.160	0.480	4.0	4.70	0.0	0.000	0.000
SUB 4 XFMR	Energized	500	4.160	0.480	4.0	4.70	0.0	0.000	0.000
SUB 5 XFMR	Energized	500	4.160	0.480	4.0	4.70	0.0	0.000	0.000
SUB 6 XFMR	Energized	500	4.160	0.480	4.0	4.70	0.0	0.000	0.000
SUB 7 XFMR	Energized	500	4.160	0.480	4.0	4.70	0.0	0.000	0.000
SUB 8 XFMR	Energized	500	4.160	0.480	4.0	4.70	0.0	0.000	0.000
SUB 9 XFMR	Energized	750	4.160	0.480	5.9	4.70	0.0	0.000	0.000
T-MCCHW1-PNL LHW	Energized	30.0	0.480	0.208	3.9	1.69	0.0	0.000	0.000
TR-DP1-XLC	Energized	10.0	0.480	0.208	4.7	1.69	0.0	0.000	0.000
TR-DP4-XLC	Energized	10.0	0.480	0.208	4.7	1.69	0.0	0.000	0.000
TR-MCC 1-PNL XFMR	Energized	15.0	0.480	0.208	4.8	1.13	0.0	0.000	0.000
TR-MCC B1-PNL XFMR	Energized	30.0	0.480	0.208	4.4	1.69	0.0	0.000	0.000
TR-MCC B2-PNL XFMR	Energized	30.0	0.480	0.208	3.9	1.69	0.0	0.000	0.000
TR-MCC B2-PNL LB1 XFMR	Energized	30.0	0.480	0.208	3.9	1.69	0.0	0.000	0.000
TR-MCC D1-PNL LD 2	Energized	30.0	0.480	0.208	4.1	1.69	0.0	0.000	0.000
TR-MCCB4-PNL LP2	Energized	15.0	0.480	0.208	4.8	1.13	0.0	0.000	0.000
TR-MCCD1-PNL LD	Energized	30.0	0.480	0.208	4.4	1.69	0.0	0.000	0.000
TR-MCCDW1-PNL LDW	Energized	30.0	0.480	0.208	4.2	1.69	0.0	0.000	0.000
TR-SUB 11-XFMR	Energized	750	4.160	0.480	5.9	3.96	0.0	0.000	0.000
TR-SUB 12-XFMR	Energized	750	4.160	0.480	5.9	3.96	0.0	0.000	0.000
TR-SUB1/2-PNL L1 XFMR	Energized	75.0	0.480	0.208	4.3	1.69	0.0	0.000	0.000
TR-SUB2-PNL CP XFMR	Energized	30.0	0.480	0.208	5.0	1.69	0.0	0.000	0.000
TR-T7A	Energized	500	4.160	0.480	4.4	4.70	0.0	0.000	0.000
TR-T8A	Energized	500	4.160	0.480	4.4	4.70	0.0	0.000	0.000

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: SWWRF

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**Cable Data Schedule**

Cable ID	Library	Status	Size	Length	#/ph	T (C)	R	X	Y	Impedance Unit
C-BLOWER AB1	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	6	110.00 ft	1	90	0.51900	0.11500	0	Ohms per 1,000 ft
C-BLOWER AB2	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	6	100.00 ft	1	90	0.51900	0.11500	0	Ohms per 1,000 ft
C-BLOWER AB3	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	6	90.000 ft	1	90	0.51900	0.11500	0	Ohms per 1,000 ft
C-BLOWER AB4	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	6	80.000 ft	1	90	0.51900	0.11500	0	Ohms per 1,000 ft
C-BLOWER AB5	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	6	70.000 ft	1	90	0.51900	0.11500	0	Ohms per 1,000 ft
C-DEEP WELL 5	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	450.00 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-DP1-CLARIFIER	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	140.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-DP1-RAS 7	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	10.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-DP1-RAS 7(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	40.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-DP1-RAS 8	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	10.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-DP1-RAS 8(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	40.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-DP1-WAS 5	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	10.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-DP1-WAS 5(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	80.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-DP1-WAS 6	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	10.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-DP1-WAS 6(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	80.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-DP1-XLC	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	10.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-DP2-CLARIFIER1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	140.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft

Project: MANATEE COUNTY ESS  
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 Filename: SWWRF

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**Cable Data Schedule**

Cable ID	Library	Status	Size	Length	#/ph	T (C)	R	X	Y	Impedance Unit
C-DP2-RAS 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	10.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-DP2-RAS 1(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	70.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-DP2-RAS 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	10.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-DP2-RAS 3(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	70.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-DP2-WAS 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	10.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-DP2-WAS 1(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	30.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-DP2-WAS 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	10.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-DP2-WAS 2(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	30.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-DP4-CLARIFIER	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	140.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-DP4-RAS 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	10.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-DP4-RAS 2(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	30.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-DP4-WAS 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	10.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-DP4-WAS 2(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	30.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-DP4-XLC	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	10.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-FPL SERVICE 1	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	1/0	25.000 ft	6	90	0.13400	0.09800	0	Ohms per 1,000 ft
C-FPL SERVICE 2	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	1/0	25.000 ft	6	90	0.13400	0.09800	0	Ohms per 1,000 ft
C-GEN 1	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	500	50.000 ft	1	90	0.03400	0.07900	0	Ohms per 1,000 ft

Project: MANATEE COUNTY ESS  
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**Cable Data Schedule**

Cable ID	Library	Status	Size	Length	#/ph	T (C)	R	X	Y	Impedance Unit
C-GEN 2	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	500	70.000 ft	1	90	0.03400	0.07900	0	Ohms per 1,000 ft
C-GEN MASTER	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	500	75.000 ft	2	90	0.03400	0.07900	0	Ohms per 1,000 ft
C-MCC 1-ABFV-1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	30.000 ft	2	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC 1-ABFV-2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	40.000 ft	2	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC 1-ABFV-3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	50.000 ft	2	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC 1-ABFV-4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	60.000 ft	2	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC 1-ABFV-5	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	70.000 ft	2	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC 1-ACU 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	40.000 ft	2	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-MCC 1-BLOWER #6 INLET	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	0.364 ft	2	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC 1-EXHAUST 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	35.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC 1-EXHAUST 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	35.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC 1-EXHAUST 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	35.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC 1-EXHAUST 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	35.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC 1-LP1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	25.000 ft	2	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC 1-PNL LP1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	10.000 ft	1	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-MCC 1-ROLL-UP DOOR	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	50.000 ft	2	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC B1-AIR BLOWER	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	40.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B1-AIR COMPRESSOR	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	45.000 ft	2	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC B1-AIR COMPRESSOR 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	50.000 ft	2	75	0.78000	0.06500	0	Ohms per 1,000 ft

Project: MANATEE COUNTY ESS  
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**Cable Data Schedule**

Cable ID	Library	Status	Size	Length	#/ph	T (C)	R	X	Y	Impedance Unit
C-MCC B1-DAF THICK 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	25.000 ft	2	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC B1-DAF THICK 2 (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	30.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC B1-EAST DAF RECYC	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	45.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B1-PNL	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	25.000 ft	2	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC B1-PNL (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	15.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC B1-PRESSURIZATION	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	80.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B1-SUBNATANT	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4	100.00 ft	2	75	0.31000	0.06000	0	Ohms per 1,000 ft
C-MCC B1-THICK WAS 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	20.000 ft	2	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B1-THICK WAS 3 (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	60.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B1-THICK WAS 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	20.000 ft	2	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B1-THICK WAS 4 (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	60.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B1-WEST DAF RECYC	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	45.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B2-AIR COMPRESSOR	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	60.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC B2-EQ DIVERSION VLV	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	45.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC B2-HOIST	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	45.000 ft	2	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC B2-PNL	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	10.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B2-PNL LB1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	30.000 ft	2	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC B2-PNL LB1 (3)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	10.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B2-PNL P3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	30.000 ft	2	75	0.20000	0.05700	0	Ohms per 1,000 ft

Project: MANATEE COUNTY ESS  
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**Cable Data Schedule**

Cable ID	Library	Status	Size	Length	#/ph	T (C)	R	X	Y	Impedance Unit
C-MCC B2-RETURN SLUDGE 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	70.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC B2-RETURN SLUDGE 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	50.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC B2-RETURN SLUDGE 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	60.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC B2-RETURN SLUDGE 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	60.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC B2-RETURN SLUDGE 5	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	70.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC B2-SLUDGE THICKENER	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	110.00 ft	2	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC B3-PNL LB1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	30.000 ft	2	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC B3-PNL P3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	30.000 ft	2	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B3-STANDBY PRESSURE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	60.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC B3-VALVE OP	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	45.000 ft	2	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC B4-ADSV 13	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	150.00 ft	2	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC B4-ADSV 14	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	190.00 ft	2	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC B4-ADSV 15	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	245.00 ft	2	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC B4-ADSV 16	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	300.00 ft	2	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC B4-EQ TANK RETURN	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	100.00 ft	2	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC B4-PNL LP 2 (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	10.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC B4-PNL LP2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	25.000 ft	2	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC D1/2-PNL LD	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	10.000 ft	2	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC D1/2-PNL LD (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	10.000 ft	2	75	0.20000	0.05700	0	Ohms per 1,000 ft

Project: MANATEE COUNTY ESS  
 Location: SWWRF  
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 Engineer: KTW  
 Filename: SWWRF

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**Cable Data Schedule**

Cable ID	Library	Status	Size	Length	#/ph	T (C)	R	X	Y	Impedance Unit
C-MCC D1-BFP FEED PUMP	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	50.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC D1-BFP FEED PUMP5	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	70.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC D1-GRAVITY THICK	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	70.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC D1-PNL LD	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	30.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC D1-PNL LD 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	25.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC D1-PNL LD2 (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	10.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC D1-SLUDGE RECIRC 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	50.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC D1-SLUDGE RECIRC 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	60.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC D1-SLUDGE RECIRC 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	70.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC D1-SLUDGE TRANSFER1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	40.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC D1-SODIUM BICARB CP	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	60.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC D1-SUPERANANANT	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1/0	160.00 ft	1	75	0.12000	0.05500	0	Ohms per 1,000 ft
C-MCC D1-THICKENER	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	60.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC D1-THICKENER 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	10.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC D2-BFP FEED PUMP1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	35.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC D2-BFP FEED PUMP4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	55.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC D2-BFP FEED PUMP6	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	65.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC D2-PNL LD	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	30.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC D2-SLUDGE RECIRC 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	55.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft



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**Cable Data Schedule**

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C-MCC D2-SLUDGE TRANSFER2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	110.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC D2-SLUDGE TRANSFER3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	65.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC D2-SLUDGE TRANSFER4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	25.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC D4 MAIN	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	60.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-MCC D4-BLOWER 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2/0	270.00 ft	1	75	0.10000	0.05400	0	Ohms per 1,000 ft
C-MCC D4-BLOWER 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2/0	225.00 ft	1	75	0.10000	0.05400	0	Ohms per 1,000 ft
C-MCC D4-MTS	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	75.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC D4-PMP 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1	275.00 ft	1	75	0.16000	0.05700	0	Ohms per 1,000 ft
C-MCC D4-PMP 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1	225.00 ft	1	75	0.16000	0.05700	0	Ohms per 1,000 ft
C-MCC D5 MAIN	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	60.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-MCC D5-BLOWER 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2/0	325.00 ft	1	75	0.10000	0.05400	0	Ohms per 1,000 ft
C-MCC D5-BLOWER 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2/0	225.00 ft	1	75	0.10000	0.05400	0	Ohms per 1,000 ft
C-MCC D5-MTS	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	75.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC D5-PMP 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1	325.00 ft	1	75	0.16000	0.05700	0	Ohms per 1,000 ft
C-MCC D5-PMP 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1	225.00 ft	1	75	0.16000	0.05700	0	Ohms per 1,000 ft
C-MCC DW1/2-PNL LDW	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	10.000 ft	2	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC DW1/2-PNL LDW(2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	10.000 ft	2	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC DW1-BFP 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	65.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC DW1-BFP 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	50.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft

Project: MANATEE COUNTY ESS  
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**Cable Data Schedule**

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C-MCC DW1-BFP 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	50.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC DW1-BFP 5	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	35.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC DW1-BFP 6	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	35.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC DW1-PLANT DRAIN	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2/0	10.000 ft	1	75	0.10000	0.05400	0	Ohms per 1,000 ft
C-MCC DW1-PLANT DRAIN 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	150.00 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC DW1-PLANT DRAIN 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	150.00 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC DW1-PLANT DRAIN 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	150.00 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC DW1-PNL LDW	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	25.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC DW1-POLYMER MIX	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	90.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC DW1-WATER HEATER	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	20.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC DW2-BFP 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	65.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC DW2-CONVEYOR CP	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	60.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC DW2-OLD MAINT.	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	210.00 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC DW2-PNL LDW	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	25.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC DW2-POLYMER FEED	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	90.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC DW2-POLYMER FEED5/6	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	80.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC E1-54" METER VAULT	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	240.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC E1-ABW 3,4,6 FESTON	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	250.00 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC E1-EF-7	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	80.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft

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**Cable Data Schedule**

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C-MCC E1-EFF. WEIR GATE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	240.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC E1-FLASH MIXER 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	270.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC E1-FLASH MIXER 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	260.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC E1-INF. WEIR GATE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	230.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC E1-PNL DP #1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	250	165.00 ft	1	75	0.05400	0.05200	0	Ohms per 1,000 ft
C-MCC E1-PNL DP #2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	250	160.00 ft	1	75	0.05400	0.05200	0	Ohms per 1,000 ft
C-MCC E1-PNL P4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	110.00 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC E1-REUSE LIFT PUMP	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	80.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC E1-ROOF A/C #1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	240.00 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC E1-SLUICE GATE #4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	230.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC E2-A/C ROOF UNIT 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	80.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC E2-ABW #7 FESTON	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	270.00 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC E2-ABW 3,4,5 FESTON	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	260.00 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC E2-ABW 3,4,5 FLOCC	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	240.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC E2-ABW 6,7FLASH MIX	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	280.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC E2-ABW FILTER 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	250.00 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC E2-ABW SLUICE GATE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	240.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft

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**Cable Data Schedule**

Cable ID	Library	Status	Size	Length	#/ph	T (C)	R	X	Y	Impedance Unit
C-MCC E2-EF-5.1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	80.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC E2-EF-5.2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	80.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC E2-EFF. FILTER PS	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4/0	300.00 ft	2	75	0.06300	0.05100	0	Ohms per 1,000 ft
C-MCC E2-MOV RATE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	260.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC E2-PNL DP #4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	300	160.00 ft	1	75	0.04500	0.05100	0	Ohms per 1,000 ft
C-MCC E2-PNL P4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	80.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC HW1/2-PNL LHW	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	10.000 ft	2	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC HW1/2-PNL LHW (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	10.000 ft	2	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC HW1/2-PNL PC/TC 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	10.000 ft	2	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC HW1-CONVEYOR EAST	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	50.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC HW1-FINAL CLAR. 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	14	335.00 ft	1	75	3.10000	0.07300	0	Ohms per 1,000 ft
C-MCC HW1-FINAL CLAR. 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	14	330.00 ft	1	75	3.10000	0.07300	0	Ohms per 1,000 ft
C-MCC HW1-GRIT CLASS WEST	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	110.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC HW1-MAIN GATE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	300.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC HW1-MECH SCREEN	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	50.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC HW1-PNL LHW	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	25.000 ft	2	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCC HW1-PRI. SLUDGE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	360.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC HW1-RSP 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	260.00 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft

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C-MCC HW1-RSP 5	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	260.00 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC HW1-SCUM EJECTOR	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	250.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC HW1-WEST CONVEYOR	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	115.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC HW2-DAVIS SCRUBBER	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	80.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC HW2-DEGRITTER CP	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	70.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC HW2-GRIT CLASS 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	70.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC HW2-GRIT PUMP 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	60.000 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC HW2-PNL LHW	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	25.000 ft	2	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC HW2-PRI. SLUDGE 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	260.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC HW2-PRI. SLUDGE 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	260.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC HW2-RSP 6	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	260.00 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC HW2-SEC CLARIFIER	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	330.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC HW2-WAS PUMP 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	270.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC HW2-WAS PUMP 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	270.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCCB2-PNL LB1 (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	10.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCCB2-PNL LC	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	10.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCCB2-PNL P3 (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	10.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCCB2-PNL PC/TC-3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	10.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCCB2-PNL XFMR	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	10.000 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft

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C-MCCB4-SUBM PUMP START	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	8	150.00 ft	1	75	0.78000	0.06500	0	Ohms per 1,000 ft
C-MCCDW1/2-PNL PC/TC-4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	10.000 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC-E1 ABW #1 FESTON	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	230.00 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC-E1 ABW #5 SLUICE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	240.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC-E1 ABW #6 FESTON	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	240.00 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC-E1 ABW #6 SLUICE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	250.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCC-E1 ABW 3,5,6 SLUICE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	10	260.00 ft	1	75	1.20000	0.06300	0	Ohms per 1,000 ft
C-MCCE1/E2-PNL P4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	15.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-MCC-E2- ABW #1 SLUICE 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	230.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC-E2 ABW #3 FESTON	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	240.00 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-MCC-E2 SLUICE GATE 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	230.00 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-MCC-E2-PLANT DRAIN PS	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4/0	200.00 ft	1	75	0.06300	0.05100	0	Ohms per 1,000 ft
C-MTS-AC-1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	12	40.000 ft	1	75	2.00000	0.06800	0	Ohms per 1,000 ft
C-SUB1/2-PNL L1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1/0	10.000 ft	1	75	0.12000	0.05500	0	Ohms per 1,000 ft
C-SUB1/2-PNL L1 XFMR 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	250	250.00 ft	1	75	0.05400	0.05200	0	Ohms per 1,000 ft
C-SUB1/2-PNL P1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1/0	250.00 ft	1	75	0.12000	0.05500	0	Ohms per 1,000 ft
C-SUB10-DEEP WELL 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	440.00 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB10-DEEP WELL PUMP 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	20.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft

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C-SUB10-DEEP WELL PUMP 3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	20.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB11/12-DEEP WELL 5	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	25.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB11-SWBDD11	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	500	160.00 ft	4	75	0.02900	0.04800	0	Ohms per 1,000 ft
C-SUB12-SWBDD12	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	500	150.00 ft	4	75	0.02900	0.04800	0	Ohms per 1,000 ft
C-SUB1-MCC E1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	500	100.00 ft	2	75	0.02900	0.04800	0	Ohms per 1,000 ft
C-SUB1-PNL DEEP WELL	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	De-energized	2	400.00 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-SUB1-PNL L1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1/0	30.000 ft	1	75	0.12000	0.05500	0	Ohms per 1,000 ft
C-SUB1-PNL P1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1/0	30.000 ft	1	75	0.12000	0.05500	0	Ohms per 1,000 ft
C-SUB1-TIE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	De-energized	350	20.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB2-MCC E2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	500	90.000 ft	2	75	0.02900	0.04800	0	Ohms per 1,000 ft
C-SUB2-PNL CP	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	6	250.00 ft	1	75	0.49000	0.06400	0	Ohms per 1,000 ft
C-SUB2-PNL CP (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	10.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-SUB2-PNL CP (3)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	2	10.000 ft	1	75	0.20000	0.05700	0	Ohms per 1,000 ft
C-SUB2-PNL L1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1/0	50.000 ft	1	75	0.12000	0.05500	0	Ohms per 1,000 ft
C-SUB2-PNL P1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	1/0	50.000 ft	1	75	0.12000	0.05500	0	Ohms per 1,000 ft
C-SUB3-MCC HW1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	500	40.000 ft	2	75	0.02900	0.04800	0	Ohms per 1,000 ft
C-SUB3-TIE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	De-energized	350	20.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB4-MCC HW2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	500	60.000 ft	2	75	0.02900	0.04800	0	Ohms per 1,000 ft
C-SUB5 FEED	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	600.00 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft

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C-SUB5-BLOWER	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	260.00 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SUB5-MCC B2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	30.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB5-MCC B4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	30.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB6 FEED	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	610.00 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SUB6-BLOWER	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	260.00 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SUB6-MCC 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	4/0	275.00 ft	1	75	0.06300	0.05100	0	Ohms per 1,000 ft
C-SUB6-MCC B1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	50.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB6-MCC B3	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	60.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB6-TIE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	De-energized	350	20.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB7-MCC D2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	310.00 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB7-MCC D4	*AmrCbl Mar , EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 45 90	Energized	4/0	120.00 ft	1	90	0.07500	0.04000	0	Ohms per 1,000 ft
C-SUB7-MCC DW2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	40.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB7-TIE	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	De-energized	350	20.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB8-MCC D1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	305.00 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB8-MCC D5	*AmrCbl Mar , EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 45 90	Energized	4/0	120.00 ft	1	90	0.07500	0.04000	0	Ohms per 1,000 ft
C-SUB8-MCC DW1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	40.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB8-NEW MAINT. BLDG	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	250	250.00 ft	1	75	0.05400	0.05200	0	Ohms per 1,000 ft
C-SUB9/10-DEEP WELL 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	40.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB9/10-DEEP WELL 2 (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	430.00 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft



Project: MANATEE COUNTY ESS  
 Location: SWWRF  
 Contract: 8910V.00  
 Engineer: KTW  
 Filename: SWWRF

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**Cable Data Schedule**

Cable ID	Library	Status	Size	Length	#/ph	T (C)	R	X	Y	Impedance Unit
C-SUB9-DEEP WELL 1 (2)	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	420.00 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB9-DEEP WELL PUMP 1	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	30.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SUB9-DEEP WELL PUMP 2	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	40.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SW11-SUB13	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	De-energized	4/0	1130 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SW12-SUB14	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	De-energized	4/0	1120 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SWBD11-DEEP WELL 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	440.00 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SWBD11-DEEP WELL PUMP 4	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	25.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SWBD11-DEEP WELL PUMP 5	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	15.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SWBD12-DEEP WELL 6	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	460.00 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SWBD12-DEEP WELL PUMP 5	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	15.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SWBD12-DEEP WELL PUMP 6	NEC , XHHW, 0.6, 100, Copper, 1/C, Magnetic, 75, 1000 ft,60, English, 20 75 90 30 75	Energized	350	25.000 ft	2	75	0.03900	0.05000	0	Ohms per 1,000 ft
C-SWGR-SUB1	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	90.000 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SWGR-SUB10	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	100.00 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SWGR-SUB11	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	120.00 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SWGR-SUB12	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	110.00 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SWGR-SUB2	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	70.000 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SWGR-SUB3	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	390.00 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SWGR-SUB4	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	400.00 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SWGR-SUB7	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	1300 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft

Project: MANATEE COUNTY ESS  
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**Cable Data Schedule**

Cable ID	Library	Status	Size	Length	#/ph	T (C)	R	X	Y	Impedance Unit
C-SWGR-SUB8	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	1300 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-SWGR-SUB9	KERITE, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 40 90	Energized	4/0	110.00 ft	1	90	0.07000	0.09000	0	Ohms per 1,000 ft
C-TR-T7A	*AmrCbl Mar, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 45 90	Energized	4/0	135.00 ft	1	90	0.07500	0.04000	0	Ohms per 1,000 ft
C-TR-T8A	*AmrCbl Mar, EPR, 5.0, 100, Copper, 1/C, Non-Mag., 90, 1000 ft,60, English, 20 90 90 45 90	Energized	4/0	135.00 ft	1	90	0.07500	0.04000	0	Ohms per 1,000 ft

**APPENDIX G – UTILITY DATA**

**This calculated symmetrical fault current does not include consideration for any motor contribution or fault current asymmetry. This number is not intended for use as the basis for motor starting calculations.**

**Additionally, the FPL equipment currently serving your facility may change over time as a result of any number of factors, including but not limited to transformer replacements due to load growth or emergencies. As a result, although we are providing you with this information for the sole purpose of assisting you in the completion of your study, you and your client should not design, install or operate your system in reliance upon any expectation that the specific size and type of equipment currently in place will remain so. If and when the size and type of the equipment changes, our employees are not always in a position to immediately notify customers. As a result it is important that you are aware of the limitation on the information we are providing in this letter and the fact that the equipment may well change in the future.**

		Secondary Voltage	Primary Voltage in KV	Fault Current (in 3 phase symmetrical amperes)	Primary Fuse (in amps)	Secondary Fuse	Z	X/R Ratio
1	Southwest Water Reclamation Facility.	4KV	22.9	16,755	140 "K"	N/A	5.10%	35.38
2	North Water Reclamation Facility	277/480V	22.9	42,893	25 "KS"	N/A	5.00%	
3	Southeast Water Reclamation Facility. Transformer #1	277/480V	22.9	42,893	40 "KS"	N/A	5.00%	
	Southeast Water Reclamation Facility. Transformer #2	277/480V	22.9	42,893	65 "KS"	N/A	5.00%	
4	Water Reuse Pumping Station at Southwest 63rd Avenue	277/480V	22.9	14,484	40 "KS"	N/A	4.00%	
5	Water Reuse Pumping Station on Spencer Perris Road, near the	277/480V	22.9	16,467	40 "KS"	N/A	5.25%	
6	Water Reuse Pumping Station on Rye Road, near the Southeast	277/480V	22.9	14,484	10 "KS"	N/A	4.00%	
7	Biosolids Process Dryer (480 volts service) located at same	277/480V	22.9	21,656	20 "KS"	N/A	5.25%	