

Center for Health Research  
and Rural Advocacy

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Geisinger Health System

Danville, Pa

Tech Report 2

**Technical Report # 2:  
Electrical Systems Existing Conditions and Building Load Summary Report**

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## Executive Summary

Technical Report 2 is an analysis of the existing electrical building systems and the associated connected loads. The Center for Health Research and Rural Advocacy (CHRR) is part of the Geisinger Health System Campus, which already has an existing 12.47KV aerial service from PPL Co Electric. The CHRR building taps into the dual radial feed extending from the main switchboard in the plant engineering substation room to transformers A, B, M, and S. Transformer S is located in the Weis Research Center which is directly adjacent to CHRR; therefore, service is tapped from transformer 'S' before step down, and is routed to the CHRR building through (1) existing and (2) new manholes.

After the service enters the building at the lower level electrical substation room, transformer '17' in switchgear '17' steps down the 12.47KV service to 480Y/277V. This voltage feeds all motor and HVAC equipment loads in the building. The voltage is then further stepped down by smaller transformers to 208Y/120V. This voltage feeds all lighting loads, receptacles, and appliance loads in the building.

CHRR also has a new 1250KW diesel fuel emergency generator located on the lower level of the building that feeds the motor control center, the (3) 500 ton chillers, and the life safety for both CHRR and the Weis Research Center. During construction, the emergency loads from CHRR will be connected to the existing emergency generator located in the Weis Research Center. The coordination of load between the two generators will be critical in the installation process.

The 60,000 sq ft building has four floors with one lighting panel for each floor. Dimming panels and relay panels are incorporated into the lighting control system for added versatility in areas such as the auditorium, multipurpose room, and open office. Coordinated with the lighting control panels are photocells and astronomical timers which control the lighting settings depending on the level of daylight in the space and the time of day.

After compiling the NEC design load calculations for all electrical loads off of the main switchboard, it became clear that the current wire sizes were not sized for NEC lighting loads. NEC requires a 3.5 VA/sq ft be used for office lighting load when sizing conductors. This value was not used in the original design possibly because CHRR is a green building and would never use such high VA levels for its lighting system. Besides the lighting load discrepancy, all wire sizes were ample for the NEC design loads.

CHRR also has a voice copper and fiber service along with two data fiber services. The voice/data communication system includes voice/data outlets, telephone outlets, podium floor boxes, floor boxes in conference rooms for video outlets, and junction boxes for voice/data at the office cubicles. The building has a fire protection system, which includes a wet standpipe system in each stair tower along with a sprinkler system which covers all main public spaces.



## **Power Distribution Systems**

The following drawings were used to create the single-line diagram for CHRRA:

- E0.1- Electrical Cover Sheet
- E0.2.1- Key Single Line Diagram- Plant Engineering System Distribution
- E0.3.1- Single Line Diagram- CHRRA Power Distribution Substation '17'
- E0.3.2- Single Line Diagram- Distribution Panel DP-2 and Power Panels PP-LL-1 and PP-2-1
- E0.4.1- Single Line Diagram- CHRRA Emergency Generator

The single line diagram is included at the end of the report in pdf format.

## **System Type Description.**

PPL Co. is supplying the Geisinger Health System Campus with a 12.47KV aerial service. The Center for Health Research and Rural Advocacy (CHRRA) is hooking onto the existing dual radial feeders from the Plant Engineering Substation to transformers A, B, M and S. Transformer S is in the basement of the Weis Research Center, which is directly adjacent to CHRRA. The feed from transformer S will go through existing manhole EMH-9A and new manholes EMH-9B and EMH-9C and then go through two Kirk key interlock and disconnect switches in switchgear '17' into the electrical substation room in the lower level of CHRRA.

Transformer '17' is a 1500/1750KVA, 3-phase, 60HZ transformer stepping down the 12.47KV service to 480Y/277V for the building usage. Transformer '17' will service the 2500A bus of substation '17'.

Substation '17' feeds (5) automatic transfer switches for life safety, (2) power panels, a future substation room, and (2) step down transformers for the building's lighting and appliance loads.

Transformer T-1 is a 300 KVA, 3-phase, 60HZ step down transformer in the electrical substation room which provides 208Y/120V service to Distribution Panel DP-1. DP-1 services all the normal power lighting panels, appliance panels, and dimmer panels from the 1000A bus.

Transformer T-3, a 30KVA, 3-phase, 60HZ step down transformer located in the ground floor electrical room, services ground floor plan AG-A.

In this building, there is a 1250 KW, 3-phase, 60HZ emergency diesel fuel generator with a 2500A circuit breaker and ground fault sensing coil. EG-CH-1 feeds emergency main switchboard EMSWBD-CH with a 2500A bus. The (3) 500-ton chillers, emergency lighting panels, emergency dimming panel, and the emergency stand-by motor control center are serviced from this switchgear. The new generator will also service load from the Weis Research Center.

The ESMCC-1 with an 800A bus, services pumps, elevators, Sump Pump 1 & 2, and multiple fan coil units. It is fed from an automatic transfer switch of 800A rating.



## Point of Owner Responsibility

PPL Co. meters the utility on the Plant Engineering Building Switchgear for the entire campus. After this metering at the 1200A circuit breaker, Geisinger assumes all responsibility for the service. For CHRRA, transformer '17' connects to campus service feed to transformers A, B, M, and S (a 600A, 150A fuse; 3(#2 & #2G w/ 4" C) dual feed).

## Voltage Systems

There is a 12.47KV utility service to the campus which is stepped down into the CHRRA building by transformer '17'. The stepped down 408Y/277V system services automatic transfer switches, the emergency generator and power panels for HVAC equipment. Then the system is stepped down again to 208Y/120v which services all lighting loads, and appliance panels (including receptacles).

## Transformer Schedule

INDIVIDUAL TRANSFORMER SCHEDULE								
TAG	PRI. VOLTAGE	SEC. VOLTAGE	SIZE (KVA)	TYPE	TEMP. RISE	TAPS	MOUNTING	REMARKS
XFMR '17'	12470V,3PH,3W	480Y/277V,3PH,4W	1500	DRY TYPE	115 DEGREE C	(4) 2.5%	PAD MTD- UNIT SUBSTATION '17' ELEC SUBSTATION RM	OWNER- PPL CO
T-1	480V,3PH,3W.	208Y/120V,3PH,4W	300	DRY TYPE	115 DEGREE C	(6) 2.5%	PAD MOUNTED ON FLOOR ELEC SUBSTATION RM	OWNER- GEISINGER W/ #3/O GEC MIN
T-3	480V,3PH,3W.	208Y/120V,3PH,4W	30	DRY TYPE	115 DEGREE C	(6) 2.5%	PAD MOUNTED ON FLOOR GRND FL ELEC RM	OWNER- GEISINGER W/ #6 GEC MIN
T-EL-1	480V,3PH,3W.	208Y/120V,3PH,4W	30	DRY TYPE	115 DEGREE C	(6) 2.5%	PAD MOUNTED ON FLOOR ELEC SUBSTATION RM	OWNER- GEISINGER W/ #6 GEC MIN
T-ESAP-LL-1	480V,3PH,3W.	208Y/120V,3PH,4W	30	DRY TYPE	115 DEGREE C	(6) 2.5%	PAD MOUNTED ON FLOOR EMERG. ELEC RM	OWNER- GEISINGER W/ #6 GEC MIN
NOTES: 1. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS								
KEY: A/N=AS NOTED								

## Emergency Power System

CHRRA has a new 250KW diesel fuel emergency generator has been installed that was sized for the needs of both the CHRRA building and the Weis Research Center. The generator feeds main emergency switchboard EMSWBD-CH-1 located on the lower level of CHRRA in the emergency generator room. The switchboard has a 2500A 408Y/277V bus that is electronically metered by Geisinger.



The following automatic transfer switches are fed from the emergency main switchboard:

- **ATS-EL-W-1 (800A, 50KAIC)**  
This ATS services the existing emergency systems in the Weis Research Center which in the future will be connected to the new generator.
- **ATS-ES-1 (800A, 50KAIC)**
- **ATS-ES-2 (800A, 50KAIC)**
- **ATS-ES-3 (800A, 50KAIC)**  
These three automatic transfer switches are connected to the (3) HVAC 500 ton chillers. Two of the chillers are to be relocated from the roof of the Weis Research Center to the lower level mechanical room of CHRRA. The third chiller added will be new in order to service the new CHRRA building loads. These three chillers are powered normally from substation '17'.
- **ATS-ES-4 (800A, 50KAIC)**  
This ATS controls the emergency standby motor control center which has an 800A, 480/277V bus. The motor control center feeds the following: elevators 1 and 2; pumps 1-6; exhaust fans 1 and 2; the transformer for panelboard ESP-LL-1 (208/120V); the control panels of condenser pumps CP-2 and CP-3, Sep 1 and 2; and fan coil unit 2.
- **ATS-EL-1 (150A, 14KAIC)**  
The 150A ATS controls the emergency lighting panels and the emergency dimming panel for CHRRA. These are fed off the 30KVA step down transformer T-EL-1.

### **Overcurrent Protection Devices**

Transformer '17' has a 100A fuse in switchgear '17'. After transformer '17', there is a 2500AF/2500AT circuit breaker to substation '17'. All other overcurrent protection devices are circuit breakers of various sizes.

### **Location of Switchgear, Panelboards, and Motor Control Centers**

Panelboards for lighting, power and emergency; switchgear, substations, transformers, and emergency equipment are located in the following electrical rooms:

- **Electrical Substation Room L03- lower level**
  - Distribution Panel DP-1
  - Transformer T-1
  - Switchgear '17'
  - Substation '17'



- Transformer '17'
- Transformer T-EL-1
- Emergency Lighting Relay Panel RP-LEL
- Emergency Panel EL-L
- Fire Alarm Control Panel
- Lighting Relay Panel RP-L
- Lighting Panel L-L
- Appliance Panel AL-1 (2 section)
- Emergency Electrical Room L09- lower level
  - Panel ESAP-LL-1
  - Transformer T-ESAP-LL-1
  - ATS-EL-1
  - ATS-ES-1
  - ATS-ES-2
  - ATS-ES-3
  - ATS-ES-4
  - Emergency Standby Motor Control Center ESMCC-1
- Emergency Generator Room L11- lower level
  - Location of the emergency generator
- Electrical Room G10- ground floor
  - Lighting Dimming Panel DMP-G1
  - Lighting Dimming Panel DMP-G2
  - Emergency Lighting Dimming Panel DMP-GEL
  - Appliance Panel AG-A
  - Transformer T-3
  - Appliance Panel AG-1 (2 section)
  - Lighting Panel L-G
  - Lighting Relay Panel RP-G
- Electrical Room 121- first floor
  - Lighting Relay Panel RP-1
  - Lighting Panel L-1
  - Emergency Lighting Panel EL-1
  - Emergency Lighting Relay Panel RP\_EL
  - Appliance Panel A1-1 (2 section)
- Electrical Room 219- second floor
  - Lighting Panel L-2
  - Lighting Relay Panel RP-2
  - Lighting Dimming Panel DMP-2
  - Appliance Panel A2-1 (2 section)



## **Lighting Systems**

The lighting system in this building is all 208Y/120V as to Geisinger standards. There are (4) lighting panelboards (one per floor) which control the general lighting systems. There are then (3) Dimmer Panels (2 on the ground floor and 1 on the second floor). The Dimmer Panels control the lighting in the auditorium, multipurpose room, and executive conference room. The dimming control is important in these spaces due to the many lighting zones and different lighting sources. These are versatile spaces that require preset scenes of lighting, making the dimming panels and controls necessary.

There are (2) emergency lighting panels (1 on the first floor and 1 on the lower level) and an emergency dimmer panel on the ground floor.

There are also (4) normal power relay panels and (2) emergency power relay panels for lighting control. These relay panels control the lighting in the open office on the first and second floor. The site lighting is also controlled by a relay panel in order to turn the lights on automatically with the astronomical timer. The majority of the relay panels are on/off control and not dimming. This use of the relay panels allows large areas of open circulation space to be controlled by one wall switch.

Photocells are also incorporated in the lighting system due to the abundance of daylight entering the building through the tempered insulated glazing. The photocells control the dimming of the open office lighting.

## **ASHRAE/IESNA 90.1 Shutoff Requirements**

All private rooms in CHRRA have wall switches for manual shut off. Storage areas have timer switches which will turn the lights off in the space after a set period of time from when the lights were manually turned on. Where appropriate (such as private offices, conference rooms, etc), a combination of wall-mounted occupancy sensors and ceiling mounted occupancy sensors are installed for automatic shut off of the lighting system after 30 minutes of the room being uninhabited. Where occupancy sensors and wall timers are not appropriate, such as large open circulation spaces and specialty spaces, relay panels control the lighting system by having timed shut off after building operation hours. This way, only emergency lighting systems are left on in the building at night for safety purposes. Dimming Panels which control spaces such as the auditorium and multipurpose room are also connected to and controlled by the timed shut off.

## **Power Factor (Capacitors)**

There are no capacitors shown on the single-line drawings.



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### **Important Design Requirements**

The reliability of the emergency generator is an issue for this building. Before the installation of the new diesel emergency generator, the life safety loads from CHRRA will be connected to the existing generator in the Weis Research Center which is in need of being replaced. After the new generator is installed, the life safety of both buildings will then be connected to the new CHRRA generator. This coordination could be an issue.

There is one lighting panel board per floor of CHRRA, so voltage drop could be a cause for concern across the 60,000 sq ft building.

The coordination of the lighting control system is also a very important design issue for CHRRA. There is a complicated system specified that incorporated the use of dimming panels linked with relay panels linked with photocells and linked with astronomical time clocks. This large system could become an issue in commissioning.



**Lamps/Ballast Table**

The lamp/ballast table includes the following information on each luminaire: number of lamps, type of lamps, ballast type, input amps, operating amps, ballast watts, ballast factor and power factor. The ballast information was taken from Advanced Transformer.

Lamping									
Luminaire	Lamp	CCT	Voltage	Ballast	BF	Input W	PF	Input Amps	Oper. Amps
A1	(3) F17T8	3500	120	ELECTRONIC	0.99	47	0.99	0.51	0.51
A2	(1) F32T8	3500	120	ELECTRONIC	0.92	35	0.99	0.27	0.27
A3	(2) F32T8	3500	120	ELECTRONIC	0.88	59	0.99	0.49	0.49
A3D	(2) F32T8	3500	120	ELEC DIM	0.05/1.0	16/70	0.99	0.6	0.6
A4	(1) F32T8	3500	120	ELECTRONIC	0.92	35	0.99	0.27	0.27
C1	(2) PL-C 26	3500	120	ELECTRONIC	1	51	0.99	0.43	0.43
C1D	(2) PL-C 26	3500	120	ELEC DIM	0.05/1.05	16/58	0.98	0.48	0.48
C3	(1) PL-T 32	3500	120	ELECTRONIC	0.98	36	0.98	0.31	0.31
C3D	(1) PL-T 32	3500	120	ELEC DIM	0.05/1.0	Sep-38	0.98	0.32	0.32
C4	(1) PL-T 32	3500	120	ELECTRONIC	0.98	36	0.98	0.31	0.31
C5	(1) PL-T 32	3500	120	ELECTRONIC	0.98	36	0.98	0.31	0.31
C6D	(2) PL-T 32	3500	120	ELEC DIM	0.05/1.0	20/76	0.98	0.64	0.64
C7	(1) PL-T 32	3500	120	ELECTRONIC	0.98	36	0.98	0.31	0.31
C8	(1) ED-17 50W MH	3500	120	ELECTRONIC	1	56	0.9	0.47	0.47
D1	(2) F32T8	3500	120	ELECTRONIC	0.88	59	0.99	0.49	0.49
E1	(1) HALOGEN 6W	3500	120	N/A	N/A	N/A	N/A	N/A	N/A
G1	(1) MR-16 50WFL	3500	120/12	N/A	N/A	N/A	N/A	N/A	N/A
J1	(1) F32T8	3500	120	ELECTRONIC	0.92	35	0.99	0.27	0.27
J2*	(1) BX39	3500	120	ELECTRONIC	0.9	43	-	-	-
J2D*	(1) BX39	3500	120	ELEC DIM	0.9	43	-	-	-
J3D	(1) F32T8	3500	120	ELEC DIM	0.05/1.0	9/35	0.99	0.29	0.29
K1*	(1) INDUCTION 85W	3500	120	ELECTRONIC	0.85	90	-	-	-
M1	(1) ED-27 250W MH	3500	208	PULSE START	0.9	295	0.9	1.4	1.45
M2	(1) ED-27 250W HPS	3500	208	CONST W XFMR	0.9	295	0.9	0.95	1.5
M3	(1) ED-27 100W MH	3500	208	PULSE START	0.9	129	0.9	0.66	0.8
N1	(1) PL-C 18	3500	120	ELECTRONIC	1.05	20	0.97	0.09	0.09
N2	(2) PL-C 26	3500	120	ELECTRONIC	1	51	0.99	0.43	0.43
P1	(2) F32T8	3500	120	ELECTRONIC	0.88	59	0.99	0.49	0.49
P2D	(2) F32T8 PER 4'	3500	120	ELEC DIM	0.05/1.0	16/70	0.99	0.6	0.6
P3D	(2) F32T8 PER 4'	3500	120	ELEC DIM	0.05/1.0	16/70	0.99	0.6	0.6
P4	(4) PL-T 32; (1) PL-T 20	3500	120	ELECTRONIC	1	75	0.99	0.63	0.63
					1	75	0.99	0.63	0.63
					0.9	22	0.97	0.16	0.16
P5	(1) F32T8	3500	120	ELECTRONIC	0.92	32	0.99	0.27	0.27
T1	(2) F32T8	3500	120	ELECTRONIC	0.88	59	0.99	0.49	0.49
T2	(2) F32T8	3500	120	ELECTRONIC	0.88	59	0.99	0.49	0.49
X1	LED- 3W	N/A	120	N/A	N/A	N/A	N/A	N/A	N/A
X2	LED- 3W	N/A	120	N/A	N/A	N/A	N/A	N/A	N/A

\* For the selected luminaires, ballast information was unable to be located and ballast factor and input watts were estimated



**Mechanical Equipment Table**

The mechanical equipment table includes description, physical location, the voltage and phase, the horsepower, full load amps, and the kilowatts. The kilovolt-amps were calculated using rule of thumb power factors for the different phases and motor sizes. A power factor of 0.90 was used for three phase motors, a power factor of 0.85 was used for single phase motors of 1/10 HP or greater, and a power factor of 0.80 was used for single phase motors of 1/12 HP or smaller.

MECHANICAL EQUIPMENT							
SYMBOL	DESCRIPTION/SERVICE	PHYSICAL LOCATION	VOLT/PHASE	HP	FLA	KW	KVA
AHU-1	AIR HANDLING UNIT WEST SIDE	MECH RM. L01	480, 3% $\phi$ c	40	52	40	44.44
AHU-2	AIR HANDLING UNIT EAST SIDE	MECH RM. L10	480, 3% $\phi$ c	30	40	30	33.33
AHU-3	AIR HANDLING UNIT AUDITORIUM	MECH RM. L10	480, 3% $\phi$ c	10	14	10	11.11
AHU-4	AIR HANDLING UNIT 2ND FLR.	MECH RM. 222	480, 3% $\phi$ c	20	27	20	22.22
CH-1	WATER CHILLER	MECH RM. L10	480, 3% $\phi$ c		444	303	336.67
CH-2	WATER CHILLER	MECH RM. L10	480, 3% $\phi$ c		444	303	336.67
CH-3	WATER CHILLER	MECH RM. L10	480, 3% $\phi$ c		444	303	336.67
CT-2	COOLING TOWER FANS	WEIS BLDG. ROOF	480, 3% $\phi$ c	3@5	7.6	5	5.56
	COOLING TOWER FANS	WEIS BLDG. ROOF	480, 3% $\phi$ c	3@5	7.6	5	5.56
	PAN HEATER	WEIS BLDG. ROOF	480, 3% $\phi$ c			6	6.67
CT-3	COOLING TOWER FANS	WEIS BLDG. ROOF	480, 3% $\phi$ c	3@5	7.6	5	5.56
	COOLING TOWER FANS	WEIS BLDG. ROOF	480, 3% $\phi$ c	3@5	7.6	5	5.56
	PAN HEATER	WEIS BLDG. ROOF	480, 3% $\phi$ c			6	6.67
P-1	CHILLED WATER PUMP	MECH RM. L10	480, 3% $\phi$ c	40	52	40	44.44
P-2	CHILLED WATER PUMP	MECH RM. L10	480, 3% $\phi$ c	40	52	40	44.44
P-3	CHILLED WATER PUMP	MECH RM L10	480, 3% $\phi$ c	40	52	40	44.44
P-4	CONDENSER WATER PUMP	MECH RM L10	480, 3% $\phi$ c	40	52	40	44.44
P-5	CONDENSER WATER PUMP	MECH RM L10	480, 3% $\phi$ c	40	52	40	44.44
P-6	CONDENSER WATER PUMP	MECH RM L10	480, 3% $\phi$ c	40	52	40	44.44
P-7	HOT WATER PUMP	WEIS MECH RM	480, 3% $\phi$ c	15	21	15	16.67
P-8	HOT WATER PUMP	WEIS MECH RM	480, 3% $\phi$ c	15	21	15	16.67
P-9	AHU-1 FREEZE PROT PUMP	MECH RM L01	480, 3% $\phi$ c	3/4	1.4	0.75	0.83
P-10	AHU-2 FREEZE PROT PUMP	MECH RM L10	480, 3% $\phi$ c	3/4	1.4	0.75	0.83
P-11	AHU-3 FREEZE PROT PUMP	MECH RM L10	120, 1% $\phi$ c	1/3	7.2	0.33333333	0.392
P-12	AHU-4 FREEZE PROT PUMP	MECH RM 222	120, 1% $\phi$ c	1/2	9.8	0.5	0.588
CP-1	CONDENSATE PUMPS	MECH RM L01	480, 3% $\phi$ c	2@1-1/2	2.6	1.5	3.333
CP-2	CONDENSATE PUMPS	MECH RM L10	480, 3% $\phi$ c	2@1-1/2	2.6	1.5	3.333
CP-3	CONDENSATE PUMPS	WEIS MECH RM	480, 3% $\phi$ c	2@5	7.6	5	11.111
CP-4	CONDENSATE PUMPS	MECH RM L10	480, 3% $\phi$ c	1 - 1/2	2.6	1.5	3.333
CP-5	CONDENSATE PUMPS	WEIS MECH RM	480, 3% $\phi$ c	1 - 1/2	2.6	1.5	3.333
FCU-1	FAN COIL UNIT	EMERG ELEC RM L09	120, 1% $\phi$ c	1/12		0.08333	0.104
FCU-2	FAN COIL UNIT	ELEV MACH RM L07	480, 3% $\phi$ c	3/4	1.4	0.75	0.833
FCU-3	FAN COIL UNIT	ELEC SUBSTATION RM L03	480, 3% $\phi$ c	1.5	2.6	1.5	1.667
FCU-4	FAN COIL UNIT	MDF L04	120, 1% $\phi$ c	1/20 & 1/8		0.125	0.147
FCU-5	FAN COIL UNIT	A/V RM G19	120, 1% $\phi$ c	0.07		0.07	0.088
FCU-6	FAN COIL UNIT	A/V RM G28	120, 1% $\phi$ c	1/20 & 1/8		0.125	0.147
FCU-7	FAN COIL UNIT	NORTH ENTRANCE G17	120, 1% $\phi$ c	1/12		0.08333333	0.104
FCU-8	FAN COIL UNIT	GND FLR DATA RM G09	120, 1% $\phi$ c	1/8		0.12	0.141
FCU-9	FAN COIL UNIT	1ST FLR DATA RM 122	120, 1% $\phi$ c	1/8		0.12	0.141
FCU-10	FAN COIL UNIT	2ND FLR DATA RM G09	120, 1% $\phi$ c	1/8		0.12	0.141
FCU-11	FAN COIL UNIT	STAIR-L2-#1	480, 3% $\phi$ c	3/4	1.4	0.75	0.833



MECHANICAL EQUIPMENT							
SYMBOL	DESCRIPTION/SERVICE	PHYSICAL LOCATION	VOLT/PHASE	HP	FLA	KW	KVA
RF-1	RETURN FAN	MECH RM L01	480, 3% $\phi$ c	20	27	20	22.222
RF-2	RETURN FAN	MECH RM L10	480, 3% $\phi$ c	15	21	15	16.667
RF-3	RETURN FAN	MECH RM L10	480, 3% $\phi$ c	3	4.8	3	3.333
RF-4	RETURN FAN	MECH RM 222	480, 3% $\phi$ c	10	14	10	11.111
EF-1	EXHAUST FAN	MECH RM L01	480, 3% $\phi$ c	1-1/2	2.6	1.5	1.667
EF-2	EXHAUST FAN	MECH RM L01	480, 3% $\phi$ c	1-1/2	2.6	1.5	1.667
EF-3	EXHAUST FAN	TOILET ROOM G11	120, 1% $\phi$ c	1/2	9.8	0.5	0.588
EF-4	EXHAUST FAN	PANTRY G08	120, 1% $\phi$ c	1/3	7.2	0.33333333	0.392
EF-5	EXHAUST FAN	ELEC RM G10	120, 1% $\phi$ c	1/4	5.8	0.25	0.294
EF-6	EXHAUST FAN	TRASH RM G23	120, 1% $\phi$ c	1/3	7.2	0.33333333	0.392
EF-7	EXHAUST FAN	TOILET RM 119	120, 1% $\phi$ c	1/2	9.8	0.5	0.588
EF-8	EXHAUST FAN	ELEC RM 121	120, 1% $\phi$ c	1/4	5.8	0.25	0.294
EF-9	EXHAUST FAN	TOILET RM 224	120, 1% $\phi$ c	1/2	9.8	0.5	0.588
EF-10	EXHAUST FAN	ELEC RM 219	120, 1% $\phi$ c	1/4	5.8	0.25	0.294
UH-1	HOT WATER UNIT HEATER	EMERG GEN RM L11	120, 1% $\phi$ c	1/8		0.125	0.147
UH-2	HOT WATER UNIT HEATER	MECH RM L10	120, 1% $\phi$ c	1/8		0.125	0.147
UH-3	HOT WATER UNIT HEATER	MECH RM L10	120, 1% $\phi$ c	1/8		0.125	0.147
UH-4	HOT WATER UNIT HEATER	STAIR-LL-#2	120, 1% $\phi$ c			0.027	0.034
UH-5	HOT WATER UNIT HEATER	SHELL SPACE L02	120, 1% $\phi$ c	1/20		0.05	0.063
UH-6	HOT WATER UNIT HEATER	SHELL SPACE L02	120, 1% $\phi$ c	1/20		0.05	0.063
UH-7	HOT WATER UNIT HEATER	MECH L01	120, 1% $\phi$ c	1/20		0.05	0.063
UH-8	HOT WATER UNIT HEATER	STAIR-LL-#1	120, 1% $\phi$ c			0.027	0.034
UH-9	HOT WATER UNIT HEATER	VESTIBULE G22	120, 1% $\phi$ c			0.215	0.253
UH-10	HOT WATER UNIT HEATER	VESTIBULE G14	120, 1% $\phi$ c			0.215	0.253
UH-11	HOT WATER UNIT HEATER	MECH RM 222	120, 1% $\phi$ c	1/20		0.05	0.063
SEP-1&2	SUMP PUMPS	MECH RM L10	480, 3% $\phi$ c	2@1-1/2	2.6	1.5	3.333

**NEC Building Design Load Calculations**

The NEC building design load calculations were based on actual connected loads for all lighting, motors, and equipment. Receptacle loads were based on the amp rating of all receptacles installed in the building. All conductor and ground wires are type THW Copper rated for a temperature of 167 degrees Fahrenheit. The following tables have a break down of the load on each feeder from substation ‘17’ and the main service feeder. The wire sizes are then determined based on the actual connected loads and a 1.25 growth factor. Please refer to Appendix A for individual panelboard load calculations used in this technical report.

Substation '17'	Feeder 1 480Y/277V	Substation '17'	Feeder 1 480Y/277V
DESCRIPTION	KVA	Wire Size:	2[3-300KCMIL & #2G in 3"C]
Chiller 1	336.37	Actual Size:	2[3-350KCMIL & 1/0G in 3"C]
TOTAL KVA	336.37	Actual Size OK- oversized	
TOTAL AMPS	404.8	Substation '17'	Feeder 1 480Y/277V
AMPS * GROWTH FACTOR 1.25	506.0	Breaker Size:	600AF/600AT
		Actual Breaker Size:	800AF/800AT

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Substation '17'	Feeder 2 480Y/277V	Substation '17'	Feeder 2 480Y/277V
<b>DESCRIPTION</b>	<b>KVA</b>	Wire Size:	2[3-300KCMIL & #2G in 3°C]
Chiller 2	336.37	Actual Size:	2[3-350KCMIL & 1/0G in 3°C]
		<b>Actual Size OK- oversized</b>	
TOTAL KVA	336.37		
		<b>Substation '17'</b>	<b>Feeder 2 480Y/277V</b>
TOTAL AMPS	404.8	Breaker Size:	600AF/600AT
AMPS * GROWTH FACTOR 1.25	506.0	Actual Breaker Size:	800AF/800AT

Substation '17'	Feeder 3 480Y/277V	Substation '17'	Feeder 3 480Y/277V
<b>DESCRIPTION</b>	<b>KVA</b>	Wire Size:	2[3-300KCMIL & #2G in 3°C]
Chiller 3	336.37	Actual Size:	2[3-350KCMIL & #1/0G in 3°C]
		<b>Actual Size OK- oversized</b>	
TOTAL KVA	336.37		
		<b>Substation '17'</b>	<b>Feeder 3 480Y/277V</b>
TOTAL AMPS	404.8	Breaker Size:	600AF/600AT
AMPS * GROWTH FACTOR 1.25	506.0	Actual Breaker Size:	800AF/800AT

Substation '17'	Feeder 4 480Y/277V	Substation '17'	Feeder 4 480Y/277V
<b>DESCRIPTION</b>	<b>KVA</b>	MOTOR DEMAND LOAD	294.04
P-1*	44.44	EQUIPMENT DEMAND LOAD**	104.40
P-2	44.44	RECEPTACLE DEMAND LOAD***	13.44
P-3	44.44		
P-4	44.44	TOTAL DEMAND LOAD	411.88
P-5	44.44	TOTAL AMPS	495.65
P-6	44.44	AMPS * GROWTH OF 1.25	619.56
EF-1	1.67		
EF-2	1.67		
CP-1	3.33		
CP-2	3.33		
SEP 1 & 2	3.33		
FCU-2	0.83		
MOTORS FROM PNL-ESAP-LL	2.10		
RECEPT FROM PNL ESAP-LL	16.88		
EQUIPMENT FROM PNL ESAP-LL	4.40		
ELEVATOR 1	50.00		
ELEVATOR 2	50.00		
		<b>Substation '17'</b>	<b>Feeder 4 480Y/277V</b>
		Wire Size:	2-[4-400KCMIL & #1/0G in 3°C]
		Actual Size:	2-[4-500KCMIL & #1/0G in 4°C]
		<b>Actual Size OK- oversized</b>	
		<b>Substation '17'</b>	<b>Feeder 4 480Y/277V</b>
		Breaker Size:	800AF/800AT
		Actual Breaker Size:	800AF/800AT

\* see calculation note 5

\*\* see calculation note 4

\*\*\* see calculation note 3

Substation '17'	Feeder 5 480Y/277V	Substation '17'	Feeder 5 480Y/277V
<b>DESCRIPTION</b>	<b>KVA</b>	Wire Size:	3#4 & #8G in 1-1/4"C
LIGHTING FROM PNL EL-L	15.83	Actual Size:	3#6 & #10G in 1" C
EQUIPMENT FROM PNL EL-L	0.5	<b>Actual Size NOT SIZED for NEC lighting load VA/sqft</b>	
LIGHTING DEMAND LOAD*	55.13		
EQUIPMENT DEMAND LOAD**	0.50		
		<b>Substation '17'</b>	<b>Feeder 5 480Y/277V</b>
TOTAL DEMAND LOAD	55.63	Breaker Size:	100AF/100AT
TOTAL AMPS	66.94	Actual Breaker Size:	100AF/45AT
AMS * GROWTH FACTOR 1.25	83.67		

\* see calculation notes 1 and 2

\*\* see calculation note 4

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Substation '17'	Feeder 6 480Y/277V	Substation '17'	Feeder 6 480Y/277V
DESCRIPTION	KVA	MOTOR DEMAND LOAD	16.04
MOTORS FROM PNL AL-1*	3.73	RECEPTACLE DEMAND LOAD**	110.24
MOTORS FROM PNL AG-1	4.8	EQUIPMENT DEMAND LOAD***	49.95
MOTORS FROM PNL AG-2	1.58	LIGHTING DEMAND LOAD****	220.5
MOTORS FROM PNL A1-1	1.90		
MOTORS FROM PNL A2-1	3.58	TOTAL DEMAND LOAD	396.73
RECEPT FROM PNL AL-1	4.14	TOTAL AMPS	477.41
RECEPT FROM PNL AG-1	53.53	AMPS * GROWTH OF 1.25	596.76
RECEPT FROM PNL A1-1	58.4		
RECEPT FROM PNL A2-1	52.9		
RECEPT FROM PNL AG-2	41.5		
EQUIPMENT FROM PNL AL-1	13.1		
EQUIPMENT FROM PNL AG-1	20.45		
EQUIPMENT FROM PNL A1-1	4.6		
EQUIPMENT FROM PNL A2-1	6.6		
EQUIPMENT FROM PNL AG-2	5.2		
PNL LL	8.7		
PNL LG	12.8		
PNL L1	10.8		
PNL L2	11.7		

Substation '17'	Feeder 6 480Y/277V
Wire Size:	2[3-350KCMIL & #2G in 3-1/4"C]
Actual Size:	2[3#4/0 & #2G in 2-1/2"C]
Actual Size NOT SIZED for NEC lighting load VA/sqft	

Substation '17'	Feeder 6 480Y/277V
Breaker Size:	600AF/600AT
Actual Breaker Size:	600AF/450AT

\* LARGEST MOTOR = 1.80 KVA, see calc note 4

\*\* see calculation note 3

\*\*\* see calculation note 5

\*\*\*\* see calculation notes 1 and 2

Substation '17'	Feeder 7 480Y/277V	Substation '17'	Feeder 7 480Y/277V
DESCRIPTION	KVA	Wire Size:	3#2 & #8G in 1-1/4"C
AHU-1*	44.44	Actual Size:	3#1/0 & #6G in 2"C
RF-1	22.22	Actual Size OK- oversized	
P-9	0.83		
MOTOR DEMAND LOAD	78.61		
TOTAL AMPS	94.60		
AMPS * GROWTH FACTOR 1.25	118.25		

Substation '17'	Feeder 7 480Y/277V
Breaker Size:	125AF/125AT
Actual Breaker Size:	250AF/150AT

\* see calculation note 4

Substation '17'	Feeder 8 480Y/277V	Substation '17'	Feeder 8 480Y/277V
DESCRIPTION	KVA	Wire Size:	3#4 & #8G in 1"C
AHU-4*	22.22	Actual Size:	3#1/0 & #6G in 2"C
RF-4	11.11	Actual Size OK- oversized	
FCU-11	0.83		
MOTOR DEMAND LOAD	39.72		
TOTAL AMPS	47.80		
AMPS * GROWTH 1.25	59.75		

Substation '17'	Feeder 8 480Y/277V
Breaker Size:	60AF/60AT
Actual Breaker Size:	250AF/125AT

\* see calculation note 4





## **Utility Rate Structure**

The electric company is PPL Co. Electric. The main website is [www.pplelectric.com](http://www.pplelectric.com). The company headquarters are located at:

PPL Headquarters  
Two North Ninth Street  
Allentown, Pa 18101

Geisinger Health System campus purchases power from PPL at 69,000 volts under rate structure LP-5 (Large General Service at 60,000 Volts or Higher). The following charges are included in this net monthly rate:

- Distribution Charge: \$0.319 per kilowatt for all kilowatts of the billing KW.
- Competitive Transition Charge: \$0.305 per kilowatt for all kilowatts of the billing KW
  - 0.286 cts. Per KWH for the first 200 KWH
  - 0.244 cts. Per KWH for the next 200 KWH
  - 0.212 cts. Per KWH for all additional KWH
- Intangible Transition Charge: \$0.901 per kilowatt for all kilowatts of the billing KW
  - 0.845 cts. Per KWH for the first 200 KWH
  - 0.720 cts. Per KWH for the next 200 KWH
  - 0.626 cts. Per KWH for all additional KWH
- Capacity and Energy Charge: \$4.844 per kilowatt for all kilowatts of the billing KW
  - 4.298 cts. Per KWH for the first 200 KWH
  - 3.616 cts. Per KWH for the next 200 KWH
  - 3.106 cts. Per KWH for all additional KWH

On-peak hours for billing are 7am to 2pm, 8am to 4pm, or 9am to 5pm local time as chosen by customer. The Geisinger Health System campus averages around 5,000,000 KWH/Month. The demand ranges between 7 and 10 MW and the load factor is about 75% with a power factor usually around 85%.

## **Voice/Data Communication Systems**

CHRRRA has a voice copper and fiber service and two data fiber services from two separate sources. A 150 square foot MDF main telecom room is on the basement level, and there is an 80 square foot IDF room on each of the other floors. Geisinger requirements are for only voice and data equipment to be located in these rooms. There are three telecommunication rooms located throughout the building. They are room G09 (ground floor), room 122 (first floor), and room 220 (second floor).

The communication system in CHRRRA includes:





- Cable Tray on the First and Second Floors.
- Cable Tray, Backboards, Conduit distribution for telecom closets in accordance with Geisinger IT standards.
- Back boxes and conduit stub-ups to accessible ceiling space for new communication system outlets.
- Double gang boxes for the voice/data outlets, which are suited for possible future fiber branch wiring if needed.

On the floor plans the following communication items were recognized:

- Voice Data outlet
- Telephone outlet
- Podium floor box with power and voice data connection
- Floor box for video outlet
- Junction box for voice data of cubicles

### **Fire Protection System**

A new fire service has been provided to the campus for the CHRRA building. In addition, a sprinkler system has been designed to include protection for all areas in the building. A wet standpipe system has been provided in each stair tower. Also, a fire department valve has been installed on each floor level in the stair tower. Sprinkler piping systems are black steel piping; sprinklers in occupied spaces are quick response, wet pendant, concealed sprinklers. The sprinklers are spaced for light hazard occupancy in the public and office areas. In the mechanical rooms and storage areas, the sprinklers are spaced for ordinary hazard.

The new fire service is equipped with the following:

- Post-indicator valve
- Alarm check valve assembly
- Fire Department inlet connection

On the floor plans, the following fire protection devices were recognized:

- Fire alarm manual pull station
- Fire alarm signal bell
- Fire alarm horn
- Fire alarm strobe
- Fire evacuation speaker

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- Fire fighter's phone
- Automatic detectors for area smoke, duct mounting, and thermal detection

### **Paging/Music System**

A public address system has been selected based on Geisinger standard specifications. Further details on the requirements are not available at this time. Junction boxes were included in the design where needed for proper paging system installation



### Appendix A: Panelboard Schedules with Loads

The values in Appendix A are taken from the construction set of panelboard schedules for the CHRA building design.

PANEL: AL-1 (SECTION 1)				VOLTAGE (V): 208 /120				PHASE & WIRE: 3 PH, 4W				KAIC RATING: 10					
LOCATION: ELEC SUBSTATION RM. L03				BUS / MAIN (AMPS):				225A / 150A MCB				POLES: 42					
CKT NO.	C.B.	WIRE SIZE	DESCRIPTION	ltg			recpt	motor	equip	DESCRIPTION			WIRE SIZE	C.B.	CKT NO.		
				A	B	C				A	B	C					
1	20	#12	REC- MECH ROOM L01 & EXTERIOR	0.54			0.54	0.90				0.90				2	
3	20	#12	REC- SHELL SPACE L02		0.72		0.72	0.72				0.72				4	
5	20	#12	REC- SHELL SPACE L02			0.54	0.54	0.72				0.72				6	
7	20	#12	ELEC. WATER COOLERS - CORR - LL	1.00					1.60	1.00		1.60				8	
9	20	#12	AIR VOL. CONTROL BOXES - LOWER LEVEL		1.20					1.20	0.50		0.50			10	
11	20	#12	UH - 4,5,6, 7 & 8 - LOWER LEVEL			1.23		1.23	0.90			0.90				12	
13	20	#12	CHEMICAL TANK FEEDS	1.00					1.00	1.00	1.00					14	
15	20	#12	SPARE									4.20			16		
17	20	#12	SPARE									4.20			18		
19	20	#12	SPARE												20		
21	20	#12	SPARE												22		
23	20	#12	SPARE												24		
25	20	#12	SPARE												26		
27	20	#12	SPARE												28		
29	20	#12	SPARE												30		
31	20	#12	SPARE												32		
33	20	#12	SPARE												34		
35	20	#12	SPARE												36		
37	20	#12	SPARE												38		
39	20	#12	SPARE												40		
41	20	#12	SPARE												42		
LOAD SUMMARY PER PHASE (KVA)				2.54	1.92	1.77	0.00	0.00	1.80	2.34	1.23	2.50	3.20	3.90	3.50	5.42	5.82
TOTAL CONNECTED LOAD (KVA)				20.97			0.00	4.14	3.73	13.10	6.04			7.34	7.59	TOTAL PER PHASE (KVA)	
TOTAL CONNECTED CURRENT (AMPS)				58.21													

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input checked="" type="checkbox"/>	DOUBLE PANE	<input type="checkbox"/>	TOP FEED
<input type="checkbox"/>	RECESSED	<input type="checkbox"/>	BOTTOM FEED
<input checked="" type="checkbox"/>	SURFACE	<input checked="" type="checkbox"/>	FEED THRU LUGS
<input checked="" type="checkbox"/>	GROUND BUS	<input checked="" type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/>	ISOLATED GROUND BUS	<input type="checkbox"/>	200% RATED NEUTRAL

PANEL: AL-1 (SECTION 2)				VOLTAGE (V): 208 /120				PHASE & WIRE: 3 PH, 4W				KAIC RATING: 10				
LOCATION: ELEC SUBSTATION RM. L03				BUS / MAIN (AMPS):				225A MLO				POLES: 42				
CKT NO.	C.B.	WIRE SIZE	DESCRIPTION	ltg			recpt	motor	equip	DESCRIPTION			WIRE SIZE	C.B.	CKT NO.	
				A	B	C				A	B	C				
43	20	#12	SPARE												44	
45	20	#12	SPARE												46	
47	20	#12	SPARE												48	
49	20	#12	SPARE												50	
51	20	#12	SPARE												52	
53	20	#12	SPARE												54	
55	20	#12	SPARE												56	
57	20	#12	SPARE												58	
59	20	#12	SPARE												60	
61	20	#12	SPARE												62	
63	20	#12	SPARE												64	
65	20	#12	SPARE												66	
67	20	#12	SPARE												68	
69	20	#12	SPARE												70	
71	20	#12	SPARE												72	
73	20	#12	SPARE												74	
75	20	#12	SPARE												76	
77	20	#12	SPARE												78	
79	20	#12	SPARE												80	
81	20	#12	SPARE												82	
83	20	#12	SPARE												84	
LOAD SUMMARY PER PHASE (KVA)				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TOTAL SUMMARY PER PHASE (KVA)
				0.00			0.00	0.00	0.00	0.00						

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input checked="" type="checkbox"/>	DOUBLE PANE	<input type="checkbox"/>	TOP FEED
<input type="checkbox"/>	RECESSED	<input type="checkbox"/>	BOTTOM FEED
<input checked="" type="checkbox"/>	SURFACE	<input checked="" type="checkbox"/>	FEED THRU LUGS
<input checked="" type="checkbox"/>	GROUND BUS	<input checked="" type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/>	ISOLATED GROUND BUS	<input type="checkbox"/>	200% RATED NEUTRAL

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PANEL: AG-1 (SECTION 1)			VOLTAGE: 208 /120			PHASE & WIRE: 3 PH, 4W			KAIC RATING: 10															
LOCATION: ELEC RM G10			PHASE & WIRE: BUS / MAIN (AMPS):			225A / 225A MCB			POLES: 84															
CKT NO.	C.B.	WIRE SIZE	DESCRIPTION	ltg			recpt			motor			equip			DESCRIPTION	WIRE SIZE	C.B.	CKT NO.					
				A	B	C	A	B	C	A	B	C	A	B	C									
1	20	1	#12 REC - FLOOR & WALL BOX - CONF RM G02	0.8					0.75	0.80					0.8			REC - FLOOR & WALL BOX - CONF RM G03	#12	20	1	2		
3	20	1	#12 REC - GEN PURPOSE - CONF RM G02		0.7				0.72	0.50						0.5		REC - SERVICE - CONF RM G03	#12	20	2	4		
5	20	1	#12 REC - GEN PURPOSE - CONF RM G03			0.7			0.70	0.50						0.5		REC - SERVICE - CONF RM G03	#12	20	2	6		
7	20	1	#12 PROJ & SCREEN - CONF RM G02	1.0								1.00	1.00		1.0			PROJ & SCREEN - CONF RM G03	#12	20	1	8		
9	20	2	#12 REC - SERVICE - CONF RM G02		0.5				0.50	0.00						0.0		spare	#12	20	1	10		
11	20	1	#12 REC - GEN PURPOSE - CONF RM G04			0.5			0.50	0.72						0.7		REC - GEN PURPOSE - CONF RM G04	#12	20	1	12		
13	20	1	#12 REC - EQUIPMENT RACKS - CONF RM G02	1.2					1.20	1.20					1.2			REC - EQUIPMENT RACKS - CONF RM G03	#12	20	1	14		
15	20	1	#12 PROJ & SCREEN - CONF RM G04		1.0				1.10	1.10			1.00		1.1			REC - FLOOR & WALL BOXS - CONF RM G04	#12	20	1	16		
17	20	1	#12 REC - GEN PURPOSE - CONF RM G05			0.7			0.72	0.50						0.5		REC - SERVICE - CONF RM G04	#12	20	2	18		
19	20	1	#12 spare	0.0					0.00	0.50					0.5			REC - SERVICE - CONF RM G04	#12	20	2	20		
21	20	1	#12 REC - FLOOR & WALL BOXS - CONF RM G05		1.1				1.10	1.20					1.2			REC - EQUIPMENT RACKS - CONF RM G04	#12	20	1	22		
23	20	1	#12 WALL BOX - RM G07			0.3			0.50			0.25				0.5			REC - SERVICE - CONF RM G05	#12	20	2	24	
25	20	1	#12 REC - GEN PURPOSE - RMS G06 & G07	0.9					0.90	0.50					0.5			REC - SERVICE - CONF RM G05	#12	20	2	26		
27	20	1	#12 REC - EQUIPMENT RACKS - CONF RM G05		1.2				1.20				1.00		1.0			PROJ & SCREEN - CONF RM G05	#12	20	1	28		
29	20	1	#12 REC - COUNTER TOP - RM G07			0.5			0.54	0.54						0.5		REC - GEN PURPOSE - PANTRY G08	#12	20	1	30		
31	20	1	#12 REC - GEN PURPOSE - RMS G01 & G30	0.9					0.90	1.20					1.2			REC - REFRIGERATOR - PANTRY G08	#12	20	1	32		
33	20	1	#12 REC - GEN PURP - RMS G13, G15, G27, & G31		0.9				0.90				3.10		3.1			REC - REFRIGERATOR - PANTRY G08	#12	20	1	34		
35	20	1	#12 REC - ELEC WATER COOLERS - CORR G13			1.0			1.00				3.10		3.1			COFFEE MAKER - PANTRY G08	#10	30	2	36		
37	20	1	#12 REC - C.T. STEAMER - PANTRY G08	1.9					1.90	1.20					1.2			REC - WARMER - PANTRY G08	#12	20	1	38		
39	30	3	#10 REC - C.T. STEAMER - PANTRY G08		1.9				1.90	1.20					1.2			REC - ICE MACHINE - PANTRY G08	#12	25	1	40		
41	20	1	#12 REC - C.T. STEAMER - PANTRY G08			1.9			1.90				0.80			0.8		EF-4 - PANTRY G08	#12	15	1	42		
LOAD SUMMARY PER PHASE (KVA)				6.7	7.3	5.6	0.00	0.00	17.33	12.16	0.00	0.80	2.25	8.20	6.4	8.1	6.7	LOAD SUMMARY PER PHASE (KVA)						
TOTAL CONNECTED LOAD (KVA)				78.8			0.00			29.49			0.80			10.45			TOTAL PER PHASE (KVA)					
TOTAL CONNECTED CURRENT (AMPS)				218.7												28.7			28.5			21.6		

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input checked="" type="checkbox"/>	DOUBLE PANE
<input type="checkbox"/>	RECESSED
<input checked="" type="checkbox"/>	SURFACE
<input checked="" type="checkbox"/>	GROUND BUS
<input type="checkbox"/>	ISOLATED GROUND BUS

<input type="checkbox"/>	TOP FEED
<input type="checkbox"/>	BOTTOM FEED
<input checked="" type="checkbox"/>	FEED THRU LUGS
<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/>	200% RATED NEUTRAL

PANEL: AG-1 (SECTION 2)			VOLTAGE: 208 /120			PHASE & WIRE: 3 PH, 4W			KAIC RATING: 10													
LOCATION: ELEC RM G10			PHASE & WIRE: BUS / MAIN (AMPS):			225A MLO			POLES: 84													
CKT NO.	C.B.	WIRE SIZE	DESCRIPTION	ltg			recpt			motor			equip			DESCRIPTION	WIRE SIZE	C.B.	CKT NO.			
				A	B	C	A	B	C	A	B	C	A	B	C							
43	50	2	#6 U.C. DISHWASHER - PANTRY G08	4.0							1.20	4.00			1.2			EF-3 - TOILET RM G11	#12	20	1	44
45	20	1	#12 REC - SERVICE CART		4.0						0.70	4.00				0.7		EF-5 - ELEC RM G10	#12	15	1	46
47	20	1	#12 REC - SERVICE CART			1.0			1.00							0.7		UH-10 - VEST G14, FCU-7 - VEST G16	#12	15	1	48
49	20	1	#12 REC - TOILET RMS G11 & G12	1.1					1.08									spare	#12	20	1	50
51	20	1	#12 MOTORIZED DOORS - VEST G14			1.0					1.00							spare	#12	20	1	52
53	20	1	#12 spare															spare	#12	20	1	54
55	20	1	#12 AIR VOL. CONTROL BOXES - GND FLOOR	1.0						1.20			1.00		1.2			REC - SERVICE CART - CAFÉ G30	#10	20	2	56
57	20	1	#12 AIR VOL. CONTROL BOXES - GND FLOOR		1.0					1.20			1.00		1.2			REC - SERVICE CART - CAFÉ G30	#10	20	2	58
59	20	2	#10 REC - SERVICE CART - BREAK OUT G01			1.2			1.20	1.20					1.2			REC - SERVICE CART - CAFÉ G30	#10	20	2	60
61	20	2	#10 REC - SERVICE CART - CAFÉ G30	1.2					1.20	1.20					1.2			REC - SERVICE CART - CAFÉ G30	#10	20	2	62
63	20	2	#10 REC - SERVICE CART - CAFÉ G30		1.2				1.20	1.20					1.2			REC - SERVICE CART - CAFÉ G30	#10	20	2	64
65	20	2	#10 REC - SERVICE CART - CAFÉ G30			1.2			1.20	1.20					1.2			REC - SERVICE CART - CAFÉ G30	#10	20	2	66
67	20	2	#10 REC - SERVICE CART - CAFÉ G30	1.2					1.20	1.20					1.2			REC - SERVICE CART - CAFÉ G30	#10	20	2	68
69	20	2	#10 REC - SERVICE CART - CAFÉ G30		1.2				1.20	1.20					1.2			REC - SERVICE CART - CAFÉ G30	#10	20	2	70
71	20	2	#10 REC - SERVICE CART - CAFÉ G30			1.2			1.20	1.20					1.2			REC - SERVICE CART - CAFÉ G30	#10	20	2	72
73	20	1	#12 REC - EXTERIOR	1.2					1.20	1.20					1.2			REC - SERVICE CART - CAFÉ G30	#10	20	2	74
75	20	1	#12 REC - EXTERIOR		0.4				0.36				0.40					SPARE	#10	20	1	76
77	20	1	#12 EF-11 - RM G11			0.4												SPARE	#10	20	1	78
79	20	1	SPARE															SPARE	#10	20	1	80
81	20	1	SPARE															SPARE	#10	20	1	82
83	20	1	SPARE															SPARE	#10	20	1	84
LOAD SUMMARY PER PHASE (KVA)				9.7	8.8	5.0	0.00	0.00	12.04	12.00	1.40	2.60	10.00	0.00	6.0	4.3	4.3	LOAD SUMMARY PER PHASE (KVA)				
				0.00			24.04			4.00			10.00									

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input checked="" type="checkbox"/>	DOUBLE PANE
<input type="checkbox"/>	RECESSED
<input checked="" type="checkbox"/>	SURFACE
<input checked="" type="checkbox"/>	GROUND BUS
<input type="checkbox"/>	ISOLATED GROUND BUS

<input type="checkbox"/>	TOP FEED
<input type="checkbox"/>	BOTTOM FEED
<input checked="" type="checkbox"/>	FEED THRU LUGS
<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/>	200% RATED NEUTRAL

# Center for Health Research and Rural Advocacy

Angela Nudy  
Lighting/Electrical

Dr. Mistrick



Geisinger Health System

Danville, Pa

## Tech Report 2

PANEL: <b>AG-2 (SECTION 1)</b>			VOLTAGE: <b>208 /120</b>			3 PH, 4W			KAIC RATING: <b>10</b>																			
LOCATION: <b>STORAGE RM G20</b>			PHASE & WIRE:			225A / 225A MCB			POLES: <b>84</b>																			
GROUND FLOOR																												
CKT NO.	C.B.	WIRE SIZE	DESCRIPTION	BUS / MAIN (AMPS):			ltg	recpt	motor	equip	DESCRIPTION			WIRE SIZE	C.B.	CKT NO.												
				A	B	C					A	B	C															
1	20	1	#12 REC - FLR BOXES 1 & 4 - MULTIPURP G18	0.4				0.36			1.20	1.2			1.1	PROJ LIFT & SCREEN #4- MULTIPURP G18	#12	20	1	2								
3	20	1	#12 REC - GEN PURPOSE - MULTIPURPOSE G18		0.9			0.90	1.08					1.1		REC - GEN PURP - RMS G22, 23, 24 & 26	#12	20	1	4								
5	20	1	#12 REC - GEN PURP - RMS G18 & G20			0.9		0.90		0.58					0.6	FCU-5 - RM G19, UH-9 - RM G26	#12	20	1	6								
7	20	1	#12 PROJ & SCREEN #1- MULTIPURP G18	1.0				0.36			1.00		0.4			REC - FLR BOXES 2 & 5- MULTIPURP G18	#12	20	1	8								
9	20	1	#12 SPARE								1.00		1.0			AIR VOL CONTROL BOXES - GND FLOOR	#12	20	1	10								
11	20	1	#12 SPARE							1.00					1.0	MOTORIZED DOORS - VEST G22	#12	20	1	12								
13	20	1	#12 PROJ & SCREEN #2- MULTIPURP G18	1.0				0.36			1.00		0.4			REC - FLR BOXES 3 & 6 - MULTIPURP G18	#12	20	1	14								
15	20	1	#12 REC - VENDING MACH - RM G21		0.5			0.50	0.50					0.5		REC - VENDING MACH - RM G21	#12	20	1	16								
17	20	1	#12 REC - VENDING MACH - RM G21			0.5		0.50	0.54						0.5	REC - INTERNET/TEL RM G25	#12	20	1	18								
19	20	1	#12 REC - EQUIPMENT RACK - AV ROOM G19	1.0				1.00			1.00		1.0			PROJ & SCREEN #3- MULTIPURP G18	#12	20	1	20								
21	20	1	#12 REC - INTERNET/TEL RM G25		0.5			0.54								SPARE		20	1	22								
23	20	1	#12 REC - EXTERIOR			0.4		0.36								SPARE		20	1	24								
25	20	1	SPARE													SPARE		20	1	26								
27	20	1	SPARE													SPARE		20	1	28								
29	20	1	SPARE													SPARE		20	1	30								
31	20	1	SPARE													SPARE		20	1	32								
33	20	1	SPARE													SPARE		20	1	34								
35	20	1	SPARE													SPARE		20	1	36								
37	20	1	SPARE													SPARE		20	1	38								
39	20	1	SPARE													SPARE		20	1	40								
41	20	1	SPARE													SPARE		20	1	42								
LOAD SUMMARY PER PHASE (KVA)				3.4	1.9	1.8	0.00	0.00	5.06	2.84	0.00	1.58	2.00	3.20	2.9	2.6	2.1	LOAD SUMMARY PER PHASE (KVA)										
TOTAL CONNECTED LOAD (KVA)				48.3			0.00			7.90			1.58			5.20												
TOTAL CONNECTED CURRENT (AMPS)				134.0												18.3			16.5			13.5			TOTAL PER PHASE (KVA)			

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input checked="" type="checkbox"/>	DOUBLE PANE	
<input type="checkbox"/>	RECESSED	
<input checked="" type="checkbox"/>	SURFACE	
<input checked="" type="checkbox"/>	GROUND BUS	
<input type="checkbox"/>	ISOLATED GROUND BUS	

<input type="checkbox"/>	TOP FEED	
<input type="checkbox"/>	BOTTOM FEED	
<input checked="" type="checkbox"/>	FEED THRU LUGS	X
<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)	
<input type="checkbox"/>	200% RATED NEUTRAL	

PANEL: <b>AG-2 (SECTION 2)</b>			VOLTAGE: <b>208 /120</b>			3 PH, 4W			KAIC RATING: <b>10</b>											
LOCATION: <b>STORAGE RM G20</b>			PHASE & WIRE:			225A MLO			POLES: <b>84</b>											
GROUND FLOOR																				
CKT NO.	C.B.	WIRE SIZE	DESCRIPTION	BUS / MAIN (AMPS):			ltg	recpt	motor	equip	DESCRIPTION			WIRE SIZE	C.B.	CKT NO.				
				A	B	C					A	B	C							
43	20	2	#10 REC - SERVICE CART - BREAKOUT G26	1.2				1.20	1.20			1.2			1.2	REC - SERVICE CART - BREAKOUT G26	#10	20	2	44
45	20	2	#10 REC - SERVICE CART - BREAKOUT G26		1.2			1.20	1.20					1.2		REC - SERVICE CART - BREAKOUT G26	#10	20	2	46
47	20	2	#10 REC - SERVICE CART - BREAKOUT G26			1.2		1.20	1.20					1.2		REC - SERVICE CART - BREAKOUT G26	#10	20	2	48
49	20	2	#10 REC - SERVICE CART - BREAKOUT G26	1.2				1.20	1.20				1.2			REC - SERVICE CART - BREAKOUT G26	#10	20	2	50
51	20	2	#10 REC - SERVICE CART - BREAKOUT G26		1.2			1.20	1.20					1.2		REC - SERVICE CART - BREAKOUT G26	#10	20	2	52
53	20	2	#10 REC - SERVICE CART - BREAKOUT G26			1.2		1.20	1.20					1.2		REC - SERVICE CART - BREAKOUT G26	#10	20	2	54
55	20	2	#10 REC - SERVICE CART - BREAKOUT G26	1.2				1.20	1.20				1.2			REC - SERVICE CART - BREAKOUT G26	#10	20	2	56
57	20	2	#10 REC - SERVICE CART - BREAKOUT G26		1.2			1.20	1.20					1.2		REC - SERVICE CART - BREAKOUT G26	#10	20	2	58
59	20	2	#10 REC - SERVICE CART - BREAKOUT G26			1.2		1.20	1.20					1.2		REC - SERVICE CART - BREAKOUT G26	#10	20	2	60
61	20	2	#10 REC - SERVICE CART - BREAKOUT G26	1.2				1.20	1.20				1.2			REC - SERVICE CART - BREAKOUT G26	#10	20	2	62
63	20	2	#10 REC - SERVICE CART - BREAKOUT G26		1.2			1.20	1.20					1.2		REC - SERVICE CART - BREAKOUT G26	#10	20	2	64
65	20	2	#10 REC - SERVICE CART - BREAKOUT G26			1.2		1.20	1.20					1.2		REC - SERVICE CART - BREAKOUT G26	#10	20	2	66
67	20	2	#10 REC - SERVICE CART - BREAKOUT G26	1.2				1.20	1.20				1.2			REC - SERVICE CART - BREAKOUT G26	#10	20	2	68
69	20	2	#10 REC - SERVICE CART - BREAKOUT G26		1.2			1.20	1.20					1.2		REC - SERVICE CART - BREAKOUT G26	#10	20	2	70
71	15	1	SPARE													SPARE		20	1	72
73	20	1	SPARE													SPARE		20	1	74
75	20	1	SPARE													SPARE		20	1	76
77	20	1	SPARE													SPARE		20	1	78
79	20	1	SPARE													SPARE		20	1	80
81	20	1	SPARE													SPARE		20	1	82
83	20	1	SPARE													SPARE		20	1	84
LOAD SUMMARY PER PHASE (KVA)				6.0	6.0	4.8	0.00	0.00	16.80	16.80	0.00	0.00	0.00	6.0	6.0	4.8	LOAD SUMMARY PER PHASE (KVA)			
				0.00			33.60			0.00			0.00							

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input checked="" type="checkbox"/>	DOUBLE PANE	
<input type="checkbox"/>	RECESSED	
<input checked="" type="checkbox"/>	SURFACE	
<input checked="" type="checkbox"/>	GROUND BUS	
<input type="checkbox"/>	ISOLATED GROUND BUS	

<input type="checkbox"/>	TOP FEED	
<input type="checkbox"/>	BOTTOM FEED	
<input checked="" type="checkbox"/>	FEED THRU LUGS	X
<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)	
<input type="checkbox"/>	200% RATED NEUTRAL	

# Center for Health Research and Rural Advocacy

Angela Nudy  
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Dr. Mistrick



Geisinger Health System

Danville, Pa

## Tech Report 2

PANEL: <b>A1-1 (SECTION 1)</b>			VOLTAGE: <b>208 /120 V</b>			PHASE & WIRE: <b>3 PH, 4W</b>			KAIC RATING: <b>10</b>																					
LOCATION: <b>ELEC RM 121</b>			BUS / MAIN (AMPS):			225A / 200A MCB			POLES: <b>42</b>																					
CKT NO.	C.B.	WIRE SIZE	DESCRIPTION	Itg			recpt			motor			equip			DESCRIPTION	WIRE SIZE	C.B.	CKT NO.											
				A	B	C	A	B	C	A	B	C	A	B	C															
1	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101	0.72			0.72	0.90				0.90			REC- ROOM 102, 103	#12	20	1	2											
3	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101		0.72		0.72	1.60				1.60			REC- ROOM 102, 103	#12	20	1	4											
5	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101			0.72	0.72	1.20				1.20			REC- ROOM 104, 105	#12	20	1	6											
7	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101	1.08			1.08	1.08				1.08			REC- ROOM 104, 105, 106	#12	20	1	8											
9	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101		1.08		1.08	1.20				1.20			REC- ROOM 106, 107, 108	#12	20	1	10											
11	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101			1.08	1.08	0.72				0.72			REC- ROOM 107, 108	#12	20	1	12											
13	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101	1.08			1.08	0.54				0.54			REC- ROOM 109	#12	20	1	14											
15	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101		1.08		1.08	1.08				1.08			REC- ROOM 110, 111, 112	#12	20	1	16											
17	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101			1.08	1.08	1.20				1.20			REC- ROOM 110, 111, 112	#12	20	1	18											
19	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101	1.08			1.08	0.54				0.54			REC- ROOM 113	#12	20	1	20											
21	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101		1.08		1.08	0.72				0.72			REC- ROOM 114, 115	#12	20	1	22											
23	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101			1.08	1.08	0.80				0.80			REC- ROOM 114, 115	#12	20	1	24											
25	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101	1.08			1.08	0.80				0.80			REC- ROOM 116, 117	#12	20	1	26											
27	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101		1.08		1.08	0.72				0.72			REC- ROOM 116, 117	#12	20	1	28											
29	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101			1.08	1.08	1.20				1.20			REC- COPIER ROOM 118	#12	20	1	30											
31	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101	0.54			0.54	1.20				1.20			REC- PRINTER ROOM 118	#12	20	1	32											
33	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101		0.54		0.54	1.60				1.60			REC- COFFEE MAKER ROOM 118	#12	20	1	34											
35	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101			0.54	0.54	1.60				1.60			REC- MICROWAVE ROOM 118	#12	20	1	36											
37	20	#13	AIR VOL. CONTROL BOXES - 1ST FLOOR	1.20								1.20			spare	#12	20	1	38											
39	20	#14	AIR VOL. CONTROL BOXES - 1ST FLOOR		1.20							1.20			spare	#12	20	1	40											
41	20	#15	AIR VOL. CONTROL BOXES - 1ST FLOOR			1.20						1.20			spare	#12	20	1	42											
LOAD SUMMARY PER PHASE (KVA)				6.78	6.78	6.78	0.00	0.00	16.74	18.70	0.00	0.00	3.60	0.00	5.06	6.92	6.72	LOAD SUMMARY PER PHASE (KVA)												
TOTAL CONNECTED LOAD (KVA)				64.90			0.00			35.44			0.00			3.60			22.62			21.36			20.92			TOTAL PER PHASE (KVA)		
TOTAL CONNECTED CURRENT (AMPS)				180.14															22.62			21.36			20.92					

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input checked="" type="checkbox"/>	DOUBLE PANE
<input type="checkbox"/>	RECESSED
<input checked="" type="checkbox"/>	SURFACE
<input checked="" type="checkbox"/>	GROUND BUS
<input type="checkbox"/>	ISOLATED GROUND BUS

<input type="checkbox"/>	TOP FEED
<input type="checkbox"/>	BOTTOM FEED
<input checked="" type="checkbox"/>	FEED THRU LUGS
<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/>	200% RATED NEUTRAL

PANEL: <b>A1-1 (SECTION 2)</b>			VOLTAGE: <b>208 /120 V</b>			PHASE & WIRE: <b>3 PH, 4W</b>			KAIC RATING: <b>10</b>												
LOCATION: <b>ELEC RM 121</b>			BUS / MAIN (AMPS):			225A MLO			POLES: <b>42</b>												
CKT NO.	C.B.	WIRE SIZE	DESCRIPTION	Itg			recpt			motor			equip			DESCRIPTION	WIRE SIZE	C.B.	CKT NO.		
				A	B	C	A	B	C	A	B	C	A	B	C						
43	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101	1.08			1.08	0.98				0.98			REC - REF. ROOM 118	#12	20	1	44		
45	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101		1.08		1.08	1.08				1.08			REC - ROOM 118, 119, 120, 121	#12	20	1	46		
47	20	#12	J.B. FOR WORKSTATION OPEN OFFICE 101			1.08	1.08	0.90				0.90			REC - HOUSEKEEPING, CORRIDOR	#12	20	1	48		
49	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101	1.00			1.00	1.08				1.08			REC - HOUSEKEEPING, CORRIDOR	#12	20	1	50		
51	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101		1.00		1.00	0.36				0.36			REC - ROOM 124	#12	20	1	52		
53	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101			0.00	0.00								spare	#12	20	1	54		
55	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101	1.00			1.00	0.72				0.72			POKE-THRU - DIST. LEARN 124	#12	20	1	56		
57	20	#12	spare					0.72							POKE-THRU - DIST. LEARN 124	#12	20	1	58		
59	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101		1.00		1.00	0.72				0.72			POKE-THRU - DIST. LEARN 124	#12	20	1	60		
61	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101	1.00			1.00	0.72				0.72			POKE-THRU - DIST. LEARN 124	#12	20	1	62		
63	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101		1.00		1.00	0.72				0.72			POKE-THRU - DIST. LEARN 124	#12	20	1	64		
65	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101			1.00	1.00	0.72				0.72			POKE-THRU - DIST. LEARN 124	#12	20	1	66		
67	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101	1.00			1.00			1.20		1.20			EF-7 - TOILET RM 119	#12	20	1	68		
69	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101		1.00		1.00			0.70		0.70			EF-8 - ELEC. RM 121	#12	20	1	70		
71	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101			1.00	1.00					1.00			ELEC WATER COOLERS - CORR 123	#12	20	1	72		
73	20	#12	J.B. FOR SATELLITE OPEN OFFICE 101	1.00			1.00								SPARE	#12	20	1	74		
75	20	#12	SPARE												SPARE	#12	20	1	76		
77	20	#12	SPARE												SPARE	#12	20	1	78		
79	20	#12	SPARE												SPARE	#12	20	1	80		
81	20	#12	SPARE												SPARE	#12	20	1	82		
83	20	#12	SPARE												SPARE	#12	20	1	84		
LOAD SUMMARY PER PHASE (KVA)				6.08	4.08	4.08	0.00	0.00	14.24	8.72	0.00	1.90	0.00	1.00	4.70	3.58	3.34	LOAD SUMMARY PER PHASE (KVA)			
				0.00			22.96			1.90			1.00								

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input checked="" type="checkbox"/>	DOUBLE PANE
<input type="checkbox"/>	RECESSED
<input checked="" type="checkbox"/>	SURFACE
<input checked="" type="checkbox"/>	GROUND BUS
<input type="checkbox"/>	ISOLATED GROUND BUS

<input type="checkbox"/>	TOP FEED
<input type="checkbox"/>	BOTTOM FEED
<input checked="" type="checkbox"/>	FEED THRU LUGS
<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/>	200% RATED NEUTRAL

# Center for Health Research and Rural Advocacy

Angela Nudy  
Lighting/Electrical

Dr. Mistrick



Geisinger Health System

Danville, Pa

## Tech Report 2

PANEL: <b>A2-1 (SECTION 1)</b>			VOLTAGE: <b>208 /120 V</b>			3 PH, 4W			KAIC RATING: <b>10</b>																			
LOCATION: <b>ELEC RM 219</b>			PHASE & WIRE:			225A / 200A MCB			POLES: <b>42</b>																			
SECOND FLOOR																												
CKT NO.	C.B.	WIRE	DESCRIPTION	BUS / MAIN (AMPS)			ltg	recpt	motor	equip	DESCRIPTION			WIRE SIZE	C.B.	CKT NO.												
				A	B	C					A	B	C															
1	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201	1.08				1.08	1.20				1.20			REC - ROOM 202, 203, 204	#12	20	1	2								
3	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201		1.08			1.08	1.08				1.08			REC - ROOM 202, 203, 204	#12	20	1	4								
5	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201			1.08		1.08	1.20				1.20			REC - ROOM 205, 206, 207	#12	20	1	6								
7	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201	1.08				1.08	1.08				1.08			REC - ROOM 205, 206, 207	#12	20	1	8								
9	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201		1.08			1.08	0.54				0.54			REC - TEAM ROOM 208	#12	20	1	10								
11	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201			1.08		1.08	1.20				1.20			REC - ROOM 209, 210, 211	#12	20	1	12								
13	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201	1.08				1.08	1.08				1.08			REC - ROOM 209, 210, 211	#12	20	1	14								
15	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201		1.08			1.08	0.54				0.54			REC - TEAM ROOM 212	#12	20	1	16								
17	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201			1.08		1.08	0.80				0.80			REC - ROOM 213, 214	#12	20	1	18								
19	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201	1.08				1.08	0.72				0.72			REC - ROOM 213, 214	#12	20	1	20								
21	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201		1.08			1.08	0.72				0.72			REC - ROOM 215, 216	#12	20	1	22								
23	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201			1.08		1.08	0.80				0.80			REC - ROOM 215, 216	#12	20	1	24								
25	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201	1.08				1.08	0.80				0.80			REC - REF. KITCHENETTE RM. 218	#12	20	1	26								
27	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201		1.08			1.08	1.60				1.60			REC - COFFEE MAKER RM. 218	#12	20	1	28								
29	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201			1.08		1.08	1.60				1.60			REC - MICROWAVE RM. 218	#12	20	1	30								
31	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201	1.08				1.08	1.08				1.08			REC - ROOM 217, 218, 223, 224	#12	20	1	32								
33	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201		1.08			1.08	0.90				0.90			REC - HOUSEKEEPING, CORRIDOR	#12	20	1	34								
35	20	1	#12 J.B. FOR WORKSTATION OPEN OFFICE 201			1.08		1.08	0.36				0.36			REC - MECH. ROOM 222	#12	20	1	36								
37	20	1	#12 spare						1.08				1.08			REC - HOUSEKEEPING CORRIDOR	#12	20	1	38								
39	20	1	#12 spare													spare	#12	20	1	40								
41	20	1	#12 spare													spare	#12	20	1	42								
LOAD SUMMARY PER PHASE (KVA)				6.48	6.48	6.48	0.00	0.00	19.44	18.36	0.00	0.00	0.00	0.00	7.04	5.38	5.96	LOAD SUMMARY PER PHASE (KVA)										
TOTAL CONNECTED LOAD (KVA)				63.08			0.00			37.82			0.00			21.50			21.52			20.06			TOTAL PER PHASE (KVA)			
TOTAL CONNECTED CURRENT (AMPS)				175.09												21.50			21.52			20.06						

<input type="checkbox"/> DOUBLE PANE	<input type="checkbox"/> TOP FEED
<input type="checkbox"/> RECESSED	<input type="checkbox"/> BOTTOM FEED
<input type="checkbox"/> SURFACE	<input checked="" type="checkbox"/> FEED THRU LUGS
<input type="checkbox"/> GROUND BUS	<input type="checkbox"/> SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/> ISOLATED GROUND BUS	<input type="checkbox"/> 200% RATED NEUTRAL

PANEL: <b>A2-1 (SECTION 2)</b>			VOLTAGE: <b>208 /120 V</b>			3 PH, 4W			KAIC RATING: <b>10</b>												
LOCATION: <b>ELEC RM 219</b>			PHASE & WIRE:			225A MLO			POLES: <b>42</b>												
SECOND FLOOR																					
CKT NO.	C.B.	WIRE	DESCRIPTION	BUS / MAIN (AMPS)			ltg	recpt	motor	equip	DESCRIPTION			WIRE SIZE	C.B.	CKT NO.					
				A	B	C					A	B	C								
43	20	1	#12 J.B. FOR SATELLITE OPEN OFFICE 201	1.00				1.00	0.80				0.80			REC - PHONE SURVEY RM. 225	#12	20	1	44	
45	20	1	#12 J.B. FOR SATELLITE OPEN OFFICE 201		1.00			1.00	1.20				1.20			REC - PHONE SURVEY RM. 225	#12	20	1	46	
47	20	1	#12 J.B. FOR SATELLITE OPEN OFFICE 201			1.00		1.00	1.20				1.20			REC - PHONE SURVEY RM. 225	#12	20	1	48	
49	20	1	#12 J.B. FOR SATELLITE OPEN OFFICE 201	1.00				1.00	0.80				0.80			REC - PHONE SURVEY RM. 225	#12	20	1	50	
51	20	1	#12 J.B. FOR SATELLITE OPEN OFFICE 201		1.00			1.00	0.72				0.72			REC - ROOM 226, 227	#12	20	1	52	
53	20	1	#12 J.B. FOR SATELLITE OPEN OFFICE 201			1.00		1.00								SPARE		20	1	54	
55	20	1	#12 J.B. FOR SATELLITE OPEN OFFICE 201	1.00				1.00								SPARE		20	1	56	
57	20	1	#12 J.B. FOR SATELLITE OPEN OFFICE 201		1.00			1.00								SPARE		20	1	58	
59	20	1	#12 J.B. FOR SATELLITE OPEN OFFICE 201			1.00		1.00					1.00			ELEC WATER COOLERS - CORR 221	#12	20	1	60	
61	20	1	#12 J.B. FOR SATELLITE OPEN OFFICE 201	1.00				1.00		1.18			1.18			P - 12 - MECH. RM. 222	#12	20	1	62	
63	20	1	#12 AIR VOL. CONTROL BOXES - 2ND FLOOR		1.20					1.18	1.20		1.18			EF - 9 - TOILET 224	#12	20	1	64	
65	20	1	#12 AIR VOL. CONTROL BOXES - 2ND FLOOR			1.20				1.22	1.20		1.22			UH - 11 - MECH. RM. 222, EF - 10 - ELEC. 219	#12	20	1	66	
67	20	1	#12 AIR VOL. CONTROL BOXES - 2ND FLOOR	1.20						1.20						SPARE		20	1	68	
69	20	1	#12 PROJ & PROJ SCREEN - CONF RM		1.00			0.36		1.00			0.36			FLOOR BOX RECS - CONF RM	#12	20	1	70	
71	20	1	SPARE													SPARE		20	1	72	
73	20	1	SPARE													SPARE		20	1	74	
75	20	1	SPARE							0.50			0.50			EQUIPMENT RACK CREDENZA - CONF RM	#12	20	1	76	
77	20	1	SPARE													SPARE		20	1	78	
79	20	1	SPARE													SPARE		20	1	80	
81	20	1	SPARE							0.50			0.50			EQUIPMENT RACK CREDENZA - CONF RM	#12	20	1	82	
83	20	1	SPARE													SPARE		20	1	84	
LOAD SUMMARY PER PHASE (KVA)				5.20	5.20	4.20	0.00	0.00	10.00	5.08	0.00	3.58	4.60	2.00	2.78	4.46	3.42	LOAD SUMMARY PER PHASE (KVA)			
				0.00			15.08			3.58			6.60								

<input type="checkbox"/> DOUBLE PANE	<input type="checkbox"/> TOP FEED
<input type="checkbox"/> RECESSED	<input type="checkbox"/> BOTTOM FEED
<input type="checkbox"/> SURFACE	<input checked="" type="checkbox"/> FEED THRU LUGS
<input type="checkbox"/> GROUND BUS	<input type="checkbox"/> SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/> ISOLATED GROUND BUS	<input type="checkbox"/> 200% RATED NEUTRAL

# Center for Health Research and Rural Advocacy

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Geisinger Health System

Danville, Pa

## Tech Report 2

PANEL: <b>AG-A</b>		VOLTAGE: <b>208 /120</b>		208 /120		KAIC RATING: <b>10</b>																		
LOCATION: <b>ELEC RM G10</b>		PHASE & WIRE:		3 PH, 4W		POLES: <b>30</b>																		
GROUND FLOOR		BUS / MAIN (AMPS):		100A / 100A MCB																				
CKT NO.	C.B.	WIRE SIZE	DESCRIPTION	Itg				recpt				motor				equip				DESCRIPTION	WIRE SIZE	C.B.	CKT NO.	
				A	B	C		A	B	C		A	B	C		A	B	C						
1	20	1	#12 REC - FLOOR BOXES - AUD G29	0.4				0.36	0.20					0.2						REC - CAMERAS - AUD G29	#12	20	1	2
3	20	1	#12 REC - GEN PURPOSE - AUD G29		0.9			0.90			0.80				0.8					FCU-6 - AV ROOM G28	#12	15	1	4
5	20	1	SPARE																SPARE		20	1	6	
7	20	1	#12 REC - PROJECTOR (PM1) - AV RM G28	0.8				0.80	0.80					0.8						REC - PROJECTOR (PM2) - AV RM G28	#12	20	1	8
9	20	1	SPARE																SPARE		20	1	10	
11	20	1	SPARE																SPARE		20	1	12	
13	20	1	#12 REC - PROJECTOR (PM3) - AV RM G28	0.8				0.80	1.20					1.2						REC - EQUIP RACK (ER1) - AV RM G28	#12	20	1	14
15	20	1	SPARE																SPARE		20	1	16	
17	20	1	SPARE																SPARE		20	1	18	
19	20	1	SPARE						1.20					1.2						REC - EQUIP RACK (ER2) - AV RM G28	#12	20	1	20
21	20	1	SPARE																SPARE		20	1	22	
23	20	1	SPARE																SPARE		20	1	24	
25	20	1	SPARE																SPARE		20	1	26	
27	20	1	SPARE																SPARE		20	1	28	
29	20	1	SPARE																SPARE		20	1	30	
LOAD SUMMARY PER PHASE (KVA)				2.0	0.9	0.0	1.00	1.00	2.86	3.40	0.00	0.80	0.00	0.00	3.4	0.8	0.0	LOAD SUMMARY PER PHASE (KVA)						
TOTAL CONNECTED LOAD (KVA)				7.1			0.00			6.26			0.80			0.00			TOTAL PER PHASE (KVA)					
TOTAL CONNECTED CURRENT (AMPS)				19.6												5.4			1.7			0.0		

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input type="checkbox"/> DOUBLE PANE	<input type="checkbox"/> TOP FEED
<input type="checkbox"/> RECESSED	<input type="checkbox"/> BOTTOM FEED
<input checked="" type="checkbox"/> SURFACE	<input type="checkbox"/> FEED THRU LUGS
<input checked="" type="checkbox"/> GROUND BUS	<input type="checkbox"/> SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/> ISOLATED GROUND BUS	<input type="checkbox"/> 200% RATED NEUTRAL

PANEL: <b>LL</b>		VOLTAGE: <b>208 /120</b>		208 /120		KAIC RATING: <b>10</b>																		
LOCATION: <b>ELEC. ROOM L03</b>		PHASE & WIRE:		3 PH, 4W		POLES: <b>30</b>																		
LOWER LEVEL		BUS / MAIN (AMPS):		100A / 100A MCB																				
CKT NO.	C.B.	WIRE SIZE	DESCRIPTION	Itg				recpt				motor				equip				DESCRIPTION	WIRE SIZE	C.B.	CKT NO.	
				A	B	C		A	B	C		A	B	C		A	B	C						
1	20	1	#12 LTG CORR ("a" RP-L)	0.4				0.40	1.30					1.3						LTG MECH RM L10 ("b" RP-L)	#12	20	1	2
3	20	1	#12 LTG MECH RM ("c" RP-L)		1.6			1.60	0.50						0.5					LTG TLT RMS	#12	20	1	4
5	20	1	#12 RELAY PNL RP-L			1.0		1.00	0.30							0.3				LTG SHELL SPACE ("f" RP-L)	#12	20	1	6
7	20	2	#8 SITE LTG.	1.2				1.20	0.40					0.4						LTG CANOPY TO FOSS BLDG ("h" RP-L)	#8	20	1	8
9	20	2	#8 SITE LTG.		1.2			1.20												SPARE		20	1	10
11	20	2	#8 SITE LTG.			0.4		0.40												SPARE		20	1	12
13	20	2	#8 SITE LTG.	0.4				0.40												SPARE		20	1	14
15	20	1	SPARE																SPARE		20	1	16	
17	20	1	SPARE																SPARE		20	1	18	
19	20	1	SPARE																SPARE		20	1	20	
21	20	1	SPARE																SPARE		20	1	22	
23	20	1	SPARE																SPARE		20	1	24	
25	20	1	SPARE																SPARE		20	1	26	
27	20	1	SPARE																SPARE		20	1	28	
29	20	1	SPARE																SPARE		20	1	30	
LOAD SUMMARY PER PHASE (KVA)				2.0	2.8	1.4	6.20	2.50						1.7	0.5	0.0	LOAD SUMMARY PER PHASE (KVA)							
TOTAL CONNECTED LOAD (KVA)				8.4			8.70			0.00			0.00			0.00			TOTAL PER PHASE (KVA)					
TOTAL CONNECTED CURRENT (AMPS)				23.3												3.7			3.3			1.4		

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input type="checkbox"/> DOUBLE PANEL	<input type="checkbox"/> TOP FEED
<input type="checkbox"/> RECESSED	<input type="checkbox"/> BOTTOM FEED
<input checked="" type="checkbox"/> SURFACE	<input checked="" type="checkbox"/> FEED THRU LUGS
<input checked="" type="checkbox"/> GROUND BUS	<input type="checkbox"/> SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/> ISOLATED GROUND BUS	<input type="checkbox"/> 200% RATED NEUTRAL



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Danville, Pa

## Tech Report 2

PANEL: <b>LG</b>			VOLTAGE: <b>208 /120</b>			PHASE & WIRE: <b>3 PH, 4W</b>			KAIC RATING: <b>10</b>							
LOCATION: <b>ELEC RM G-10</b>			BUS / MAIN (AMPS): <b>100A / 60A MCB</b>			POLES: <b>30</b>										
CKT NO.	C.B. A P	WIRE SIZE	DESCRIPTION	ltg			recpt	motor	equip	DESCRIPTION			WIRE SIZE	C.B. A P	CKT NO.	
				A	B	C				A	B	C				
1	20	1	#12 LTG. OUTSIDE	0.8		0.80	0.30				0.3					
3	20	1	#12 LTG. G01, G30, G31 ("a" RP-G)		0.5	0.50	1.00				1.0					
5	20	1	#12 LTG. COVE ("c" RP-G)			1.0	1.30					1.3				
7	20	1	#12 LTG. G26 ("w" RP-G)	1.4		1.40	1.00				1.0					
9	20	1	#12 LTG. G26 ("d" RP-G)		1.0	1.00										
11	20	1	#12 LTG. COVE ("k" RP-G)			1.5	1.50									
13	20	1	#12 LTG. COVE ("k" RP-G)			1.5	1.50									
15	20	1	#12 LTG. COVE ("k" RP-G)			1.5	1.50									
17	20	1	SPARE													
19	20	1	SPARE													
21	20	1	SPARE													
23	20	1	SPARE													
25	20	1	SPARE													
27	20	1	SPARE													
29	20	1	SPARE													
LOAD SUMMARY PER PHASE (KVA)				3.7	3.0	2.5	9.20	3.60			1.3	1.0	1.3	LOAD SUMMARY PER PHASE (KVA)		
TOTAL CONNECTED LOAD (KVA)				12.8			12.80	0.00	0.00	0.00						
TOTAL CONNECTED CURRENT (AMPS)				35.5							5.0 4.0 3.8			TOTAL PER PHASE (KVA)		

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION											
<input type="checkbox"/>	DOUBLE PANEL	<input type="checkbox"/>	TOP FEED								
<input type="checkbox"/>	RECESSED	<input type="checkbox"/>	BOTTOM FEED								
<input checked="" type="checkbox"/>	SURFACE	<input type="checkbox"/>	FEED THRU LUGS								
<input checked="" type="checkbox"/>	GROUND BUS	<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)								
<input type="checkbox"/>	ISOLATED GROUND BUS	<input type="checkbox"/>	200% RATED NEUTRAL								

PANEL: <b>L1</b>			VOLTAGE: <b>208 /120</b>			PHASE & WIRE: <b>3 PH, 4W</b>			KAIC RATING: <b>10</b>							
LOCATION: <b>ELEC RM 121</b>			BUS / MAIN (AMPS): <b>100A / 100A MCB</b>			POLES: <b>30</b>										
CKT NO.	C.B. A P	WIRE SIZE	DESCRIPTION	ltg			recpt	motor	equip	DESCRIPTION			WIRE SIZE	C.B. A P	CKT NO.	
				A	B	C				A	B	C				
1	20	1	#12 LTG. OFF. 102 - 110	1.6		1.60	1.00				1.0					
3	20	1	#12 LTG. OPEN OFFICES 101		1.5	1.50	1.80				1.8					
5	20	1	#12 LTG. OFF. 111 - 118			1.5	0.80					0.8				
7	20	1	#12 LTG. OPEN OFFICES 101	1.6		1.60										
9	20	1	#12 RELAY PANEL RP-1		1.0	1.00										
11	20	1	SPARE													
13	20	1	SPARE													
15	20	1	SPARE													
17	20	1	SPARE													
19	20	1	SPARE													
21	20	1	SPARE													
23	20	1	SPARE													
25	20	1	SPARE													
27	20	1	SPARE													
29	20	1	SPARE													
LOAD SUMMARY PER PHASE (KVA)				3.2	2.5	1.5	7.20	3.60			1.0	1.8	0.8	LOAD SUMMARY PER PHASE (KVA)		
TOTAL CONNECTED LOAD (KVA)				10.8			10.80	0.00	0.00	0.00						
TOTAL CONNECTED CURRENT (AMPS)				30.0							4.2 4.3 2.3			TOTAL PER PHASE (KVA)		

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION											
<input type="checkbox"/>	DOUBLE PANEL	<input type="checkbox"/>	TOP FEED								
<input type="checkbox"/>	RECESSED	<input type="checkbox"/>	BOTTOM FEED								
<input checked="" type="checkbox"/>	SURFACE	<input type="checkbox"/>	FEED THRU LUGS								
<input checked="" type="checkbox"/>	GROUND BUS	<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)								
<input type="checkbox"/>	ISOLATED GROUND BUS	<input type="checkbox"/>	200% RATED NEUTRAL								

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## Tech Report 2

PANEL: <b>L2</b>			VOLTAGE: <b>208 /120</b>			PHASE & WIRE: <b>3 PH, 4W</b>			KAIC RATING: <b>10</b>							
LOCATION: <b>ELEC RM 219</b>			BUS / MAIN (AMPS):			100A / 100A MCB			POLES: <b>30</b>							
CKT NO.	C.B. A P	WIRE SIZE	DESCRIPTION	lg			recpt	motor	equip	DESCRIPTION			WIRE SIZE	C.B. A P	CKT NO.	
				A	B	C				A	B	C				
1	20	1	#12 LTG. OFF. 202 - 208	1.4		1.40	0.80					0.8				2
3	20	1	#12 LTG. OPEN OFFICES ("f" RELAY RP-2)		1.4		1.40	1.50				1.5				4
5	20	1	#12 LTG. OFF. 209 - 216			1.4	0.80						0.8			6
7	20	1	#12 LTG. OPEN OFFICES ("f" RELAY RP-2)	1.2			1.20	1.00				1.0				8
9					0.6		0.60	0.40				0.4				10
11	30	3	#10 DIMMER PANEL DMP-2			0.60										12
13				0.6		0.60										14
15	20	1	SPARE													16
17	20	1	SPARE													18
19	20	1	SPARE													20
21	20	1	SPARE													22
23	20	1	SPARE													24
25	20	1	SPARE													26
27	20	1	SPARE													28
29	20	1	SPARE													30
LOAD SUMMARY PER PHASE (KVA)				3.2	2.0	2.0	7.20	4.50				1.8	1.9	0.8	LOAD SUMMARY PER PHASE (KVA)	
TOTAL CONNECTED LOAD (KVA)				11.7			11.70	0.00	0.00	0.00						
TOTAL CONNECTED CURRENT (AMPS)				32.5						5.0			3.9	2.8	TOTAL PER PHASE (KVA)	

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input type="checkbox"/>	DOUBLE PANEL
<input type="checkbox"/>	RECESSED
<input type="checkbox"/>	SURFACE
<input type="checkbox"/>	GROUND BUS
<input type="checkbox"/>	ISOLATED GROUND BUS

<input type="checkbox"/>	TOP FEED
<input type="checkbox"/>	BOTTOM FEED
<input type="checkbox"/>	FEED THRU LUGS
<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/>	200% RATED NEUTRAL

PANEL: <b>EL-L</b>			VOLTAGE: <b>208 /120</b>			PHASE & WIRE: <b>3 PH, 4W</b>			KAIC RATING: <b>10</b>							
LOCATION: <b>ELEC RM 121 LOWER FLOOR.</b>			BUS / MAIN (AMPS):			100A / 100A MCB			POLES: <b>30</b>							
CKT NO.	C.B. A P	WIRE SIZE	DESCRIPTION	lg			recpt	motor	equip	DESCRIPTION			WIRE SIZE	C.B. A P	CKT NO.	
				A	B	C				A	B	C				
1	20	1	#12 CORR. LTG. GROUND FLOOR ("f" RP-LEL)	1.0		1.00	0.50				0.5				2	
3	20	1	#12 VESTIBULE LTG. GROUND FL. ("f" RP-LEL)		0.5		0.50	1.10			1.1				4	
5	20	1	#12 CORR. LTG. LOWER FLOOR ("e" RP-LEL)			1.0	0.50					0.5			6	
7	20	1	#12 D.S. FOR ELEV. NO. 2 CAB CONTROL & LTG.	1.0			1.00	1.00			1.0				8	
9	20	1	#12 D.S. FOR ELEV. NO. 2 CAB CONTROL & LTG.		1.0		1.00	0.50			0.5				10	
11	20	1	#12 FIRE ALARM CONTROL PANEL ROOM L03 LL			0.5	0.10			0.50		0.1			12	
13	20	1	#8 CANOPY TO FOSS BLDG ("m" RP-LEL)	0.2		0.15	0.30				0.3				14	
15	20	1	SPARE												16	
17	20	1	SPARE												18	
19	20	1	SPARE												20	
21	20	1	SPARE												22	
23	20	1	SPARE												24	
25			SEE	0.46		0.46	2.50				2.5				26	
27	30	3	SLD DMP-GEL		0.46		0.46	2.10				2.1			28	
29					0.46		0.46	1.20					1.2		30	
LOAD SUMMARY PER PHASE (KVA)				2.6	2.0	2.0	6.03	9.80			0.50	4.3	3.7	1.8	LOAD SUMMARY PER PHASE (KVA)	
TOTAL CONNECTED LOAD (KVA)				16.3			15.83	0.00	0.00	0.50						
TOTAL CONNECTED CURRENT (AMPS)				45.3						6.9			5.7	3.8	TOTAL PER PHASE (KVA)	

OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input type="checkbox"/>	DOUBLE PANEL
<input type="checkbox"/>	RECESSED
<input type="checkbox"/>	SURFACE
<input type="checkbox"/>	GROUND BUS
<input type="checkbox"/>	ISOLATED GROUND BUS

<input type="checkbox"/>	TOP FEED
<input type="checkbox"/>	BOTTOM FEED
<input type="checkbox"/>	FEED THRU LUGS
<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/>	200% RATED NEUTRAL

# Center for Health Research and Rural Advocacy

Angela Nudy  
Lighting/Electrical

Dr. Mistrick



Geisinger Health System

Danville, Pa

## Tech Report 2

PANEL: ESAP-LL-1		VOLTAGE: 208 /120 V		3 PH, 4W		KAIC RATING: 10																						
LOCATION: EMERGENCY ELECTRICAL RM L09		PHASE & WIRE:		100A / 100A MCB		POLES: 42																						
LOWER LEVEL		BUS / MAIN (AMPS):																										
CKT NO.	C.B. A P	WIRE SIZE	DESCRIPTION	lg			recept			motor			equip			DESCRIPTION	WIRE SIZE	C.B. A P	CKT NO.									
				A	B	C	A	B	C	A	B	C	A	B	C													
1	20	#12	FCU-4 - MDF ROOM L04, LOWER LEVEL	0.40						0.40	0.40			0.40				FCU-9, DATA ROOM 122, 1ST FLOOR	#12	20	1	2						
3	20	#12	REC - MDF ROOM L04, LOWER LEVEL		1.00				1.00	1.00				1.00				REC - DATA ROOM 122, 1ST FLOOR	#12	20	1	4						
5	20	#12	REC - MDF ROOM L04, LOWER LEVEL			1.00			1.00	1.00				1.00				REC - DATA ROOM 122, 1ST FLOOR	#12	20	1	6						
7	20	#12	REC - MDF ROOM L04, LOWER LEVEL		1.00				1.00	0.18				0.18				REC - ELEC ROOM 121, 1ST FLOOR	#12	20	1	8						
9	20	#12	REC - MDF ROOM L04, LOWER LEVEL		1.00				1.00		0.40			0.40				FCU-10, DATA ROOM 220, 2ND FLOOR	#12	20	1	10						
11	20	#12	REC - MDF ROOM L04, LOWER LEVEL			1.00			1.00	1.00				1.00				REC - DATA ROOM 220, 2ND FLOOR	#12	20	1	12						
13	20	#12	REC - ELEC SUB. ROOM L03, LOWER LEVEL	0.36					0.36	1.00				1.00				REC - DATA ROOM 220, 2ND FLOOR	#12	20	1	14						
15	20	#12	REC - EMERG. ELEC. RM L09, LOWER LEVEL		0.36				0.36	0.18				0.18				REC - ELEC ROOM 219, 2ND FLOOR	#12	20	1	16						
17	20	#12	REC - EMERG. GEN. ROOM L11, LOWER LEVEL			0.36			0.36	0.80				0.80				REC - REFRIGERATOR, OPEN OFFICE 101, 1ST FLR	#12	20	1	18						
19	20	#12	REC - ELEV. MACH. ROOM L07, LOWER LEVEL		0.18				0.18	0.80				0.80				REC - REFRIGERATOR, OPEN OFFICE 101, 1ST FLR	#12	20	1	20						
21	20	#12	DDC PANELS		1.00				0.80		1.00			0.80				REC - REFRIGERATOR, OPEN OFFICE 101, 1ST FLR	#12	20	1	22						
23	20	#12	DDC PANELS			1.00			0.80		1.00			0.80				REC - REFRIGERATOR, OPEN OFFICE 101, 1ST FLR	#12	20	1	24						
25	20	#12	REC - ELEVATOR PIT NO. 1, GROUND FLOOR		0.18				0.18		0.50			0.50				FCU-1 - EMERG. ELEC. RM L09	#12	15	1	26						
27	20	#12	REC - ELEVATOR PIT NO. 2, GROUND FLOOR			0.18			0.18	0.70				0.70				REC - SUMP PUMP - ELEVATOR PIT - LL	#12	20	1	28						
29	20	#12	FCU-8, DATA ROOM G09, GROUND FLOOR			0.40					0.40			0.40				HEAT TRACE - ABOVE CLG. EXT MAIN ENTRANCE	#12	20	1	30						
31	20	#12	REC - DATA ROOM G09, GROUND FLOOR		1.00				1.00									HEAT TRACE - LOWER LEVEL AREAWAY				32						
33	20	#12	REC - DATA ROOM G09, GROUND FLOOR			1.00			1.00									HEAT TRACE - LOWER LEVEL AREAWAY				34						
35	20	#12	DDC PANELS			1.00					1.00	0.50		0.50				FUEL TANK	#12	20	1	36						
37	20		SPARE									0.50		0.50				REFRIGERANT MONITOR PANEL	#12	20	1	38						
39	20		SPARE															SPARE	#12	20	1	40						
41	20		SPARE															SPARE	#12	20	1	42						
LOAD SUMMARY PER PHASE (KVA)				3.12	4.54	4.76	0.00	0.00	8.62	8.26	0.80	1.30	3.00	1.40	3.38	3.08	4.50											
TOTAL CONNECTED LOAD (KVA)				23.38			0.00			16.88			2.10			4.40												
TOTAL CONNECTED CURRENT (AMPS)				64.90												6.50			7.62			9.26			TOTAL PER PHASE (KVA)			

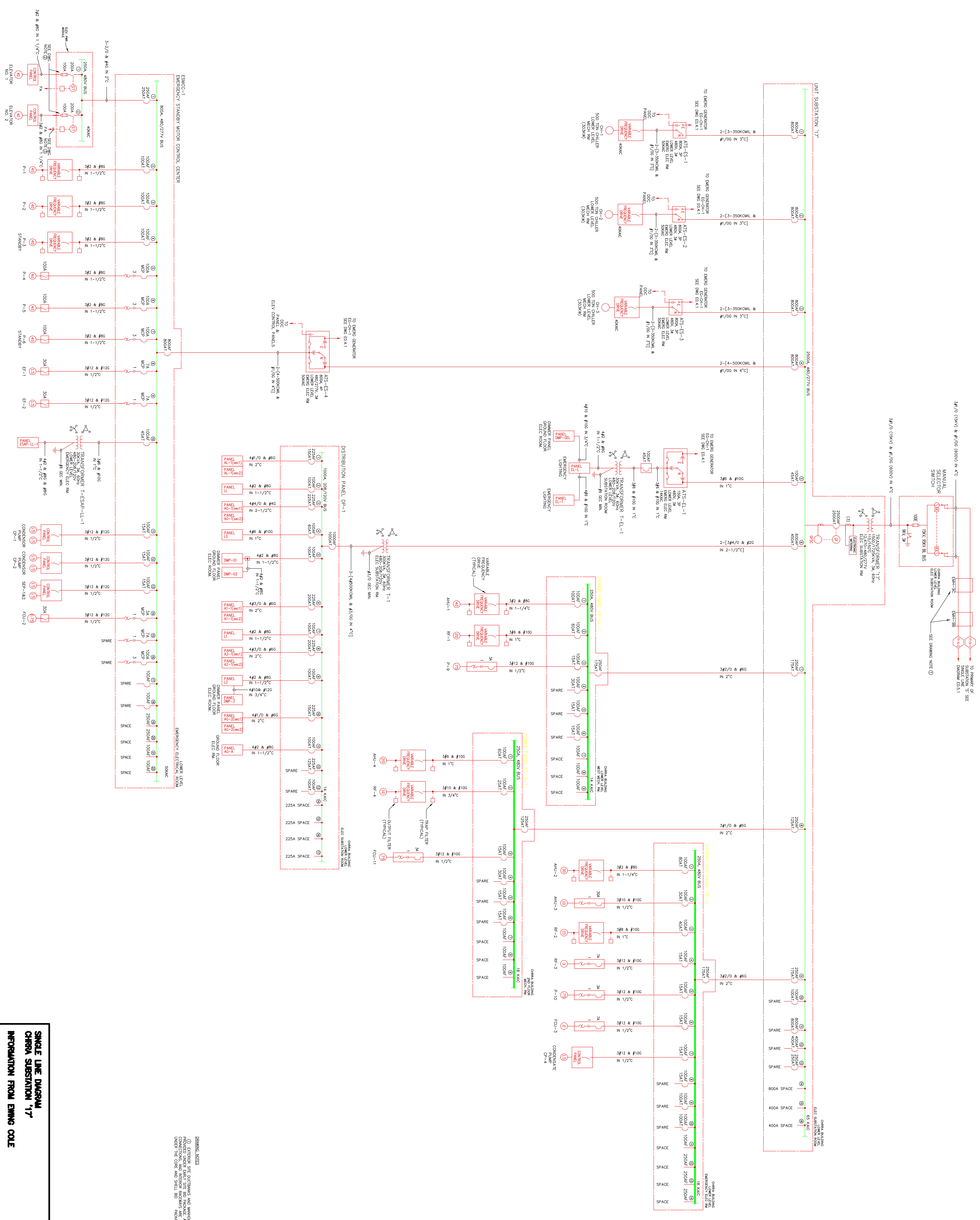
OPTIONS & ACCESSORIES - (X) INDICATES SELECTION

<input type="checkbox"/>	DOUBLE PANEL
<input type="checkbox"/>	RECESSED
<input checked="" type="checkbox"/>	SURFACE
<input checked="" type="checkbox"/>	GROUND BUS
<input checked="" type="checkbox"/>	ISOLATED GROUND BUS

NOTES:  
1. PROVIDE GROUND FAULT CIRCUIT BREAKER (6-50milliampere EQUIPMENT PROTECTION).

<input type="checkbox"/>	TOP FEED
<input type="checkbox"/>	BOTTOM FEED
<input checked="" type="checkbox"/>	FEED THRU LUGS
<input type="checkbox"/>	SUB FEED MAIN LUGS (DOUBLE LUGS)
<input type="checkbox"/>	200% RATED NEUTRAL

SEE NOTE 1  
SEE NOTE 1  
SEE NOTE 1



DESIGNED BY: [Name]  
 CHECKED BY: [Name]  
 APPROVED BY: [Name]  
 DATE: [Date]

**SINGLE LINE DIAGRAM  
 CHERA SUBSTATION 17  
 INFORMATION FROM EWING COLE**