

ELECTRICAL DEPTH STUDY

The first part of the electrical analysis focuses on modifying the electrical system based on the lighting redesigns. The subsequent sections evaluate the effectiveness of the existing system, and propose possible changes to the system.

The spaces which contain altered lighting systems are a conference room (level 1), student lounge (level 1), cafeteria serving space (level 2), roof deck (level 3) and a typical dorm room (level 4).

The second electrical analysis calculates fault current potential along a system path. The calculated values are compared against the equipment's rated values. A protective device coordination study will also be performed. The time-current curves of the three overcurrent protection devices along the path are overlaid to determine if they are coordinated.

The third electrical analysis changes the lighting voltages from a combination of 120V and 277V to only 277V. The wire and conduit sizes will be re-evaluated to determine the cost savings available with this change.

The final electrical depth study involves an arc fault study, short circuit analysis and protective device coordination study. The analysis will assess the system from the utility through to each panelboard or motor. The data will be input into the SKM analysis program.

*The panelboard schedules were completed with the information provided. Some panelboards may be incomplete due to lack of information.

CONFERENCE ROOM

The conference room serves the function of meeting space, classroom and social gathering space. The space features three glass walls, two to the exterior on the north and west sides, and one to the café space, to the south of the building. The east facing wall is covered in wood paneling. The ceiling is a combination of acoustical ceiling tile and painted drywall. The flooring is carpet.



The conference room is 340 ft², with a 14 ft ceiling height. The entrance to the conference room is on the south facing wall, though the café.

ELECTRICAL CHARACTERISTICS

Panelboard LP4B serves the branch circuit in this room. The emergency lighting is served by a branch circuit from panelboard LS42. Panelboard LP4B is located in the basement in room 010 (E-600) and panelboard LS42 on the second floor electrical closet EC-201 (E-600).

Panelboard LP4B has a lower load with the new design. The existing load from the room is 650 W, while the new design utilizes 488 W. The load is divided into two branch circuits, with 427 W going to LP4B-15 and 61 W going to LS42-6.

Conference Room: New Lighting Load Calculations

Fixture	Mounting	W	VA	A	PF	QTY	Total W	Total VA	Total A	Circuits
F6	Recessed	28	60.94	0.22	1.0	3	84	182.82	0.66	LP4B-15
F7	Recessed	63	63.71	0.23	1.0	4	252	254.84	1.84	LP4B-15 LS42-6
F8	Recessed	20	38.78	0.14	1.0	8	160	310.24	0.56	LP4B-15

EXISTING PANELBOARDS

LP4B													
VOLTAGE	480Y/277V, 3P, 4W		TAG							TYPE PANEL		FEED	
MOUNTING	Surface		LOCATION							C/B MIN	AIC		
SIZE/TYPE BUS	225 A		REMARKS							OPTIONS/ACCESSRS			
SIZE/TYPE MAINS													
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	1596.0	20A/1P	1	*			2	20A/1P	0.0		Spare	
Lighting	Basement	482.0	20A/1P	3		*		4	20A/1P	0.0		Spare	
Lighting	Basement	1194.0	20A/1P	5			*	6	20A/1P	0.0		Spare	
Lighting	Lounge	1100.0	20A/1P	7	*			8	20A/1P	0.0		Spare	
Lighting	Serving Area	2265.0	20A/1P	9		*		10	20A/1P	0.0		Spare	
Lighting	Serving Area	1500.0	20A/1P	11			*	12	20A/1P	0.0		Spare	
Lighting	Lounge	1765.0	20A/1P	13	*			14	20A/1P	0.0		Spare	
Lighting	Conf Room	1529.0	20A/1P	15		*		16	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	17			*	18	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	19	*			20	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	21		*		22	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	23			*	24	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	25	*			26	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	27		*		28	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	29			*	30	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	31	*			32	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	33		*		34	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	35			*	36	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	37	*			38	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	39		*		40	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	41			*	42	20A/1P	0.0		Spare	
SUB-TOTAL	A PHASE	4461.0		B PHASE						4276.0	C PHASE	2694.0	
TOTAL CONNECTED LOAD (WATTS)		11431.0									DEMAND LOAD	10287.8	

LS42													
VOLTAGE			TAG							TYPE PANEL		FEED	
MOUNTING			LOCATION							C/B MIN	AIC		
SIZE/TYPE BUS			REMARKS							OPTIONS/ACCESSRS			
SIZE/TYPE MAINS													
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	84.0		1	*			2		1658.0	Basement	Lighting	
Lighting	2nd Floor	1155.0		3		*		4		1370.0	Basement	Lighting	
Lighting	2nd Floor	1230.0		5			*	6		1367.0	First Floor	Lighting	
Lighting	Stairwell	390.0		7	*			8		639.0	First Floor	Lighting	
Lighting	Stairwell	280.0		9		*		10		105.0	First Floor	Lighting	
Spare		0.0		11			*	12		90.0	First Floor	Lighting	
Spare		0.0		13	*			14		418.0	Third Floor	Lighting	
Spare		0.0		15		*		16		540.0	Third Floor	Lighting	
Spare		0.0		17			*	18		0.0		Spare	
Spare		0.0		19	*			20		0.0		Spare	
Spare		0.0		21		*		22		0.0		Spare	
Spare		0.0		23			*	24		0.0		Spare	
Spare		0.0		25	*			26		0.0		Spare	
Spare		0.0		27		*		28		0.0		Spare	
Spare		0.0		29			*	30		0.0		Spare	
Spare		0.0		31	*			32		0.0		Spare	
Spare		0.0		33		*		34		0.0		Spare	
Spare		0.0		35			*	36		0.0		Spare	
Spare		0.0		37	*			38		0.0		Spare	
Spare		0.0		39		*		40		0.0		Spare	
Spare		0.0		41			*	42		0.0		Spare	
SUB-TOTAL	A PHASE	3189.0		B PHASE						3450.0	C PHASE	2687.0	
TOTAL CONNECTED LOAD (WATTS)		9326.0									DEMAND LOAD	8393.4	

REDESIGNED PANELBOARDS

LP4B												
VOLTAGE	480Y/277V, 3P, 4W		TAG							TYPE PANEL		FEED
MOUNTING	Surface		LOCATION							C/B MIN	AIC	
SIZE/TYPE BUS	225 A									OPTIONS/ACCESSRS		
SIZE/TYPE MAINS										REMARKS		
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION
Lighting	Basement	1596.0	20A/1P	1				2	20A/1P	0.0		Spare
Lighting	Basement	482.0	20A/1P	3				4	20A/1P	0.0		Spare
Lighting	Basement	1194.0	20A/1P	5				6	20A/1P	0.0		Spare
Lighting	Lounge	1100.0	20A/1P	7				8	20A/1P	0.0		Spare
Lighting	Serving Area	2265.0	20A/1P	9				10	20A/1P	0.0		Spare
Lighting	Serving Area	1500.0	20A/1P	11				12	20A/1P	0.0		Spare
Lighting	Lounge	1765.0	20A/1P	13				14	20A/1P	0.0		Spare
Lighting	Conf Room	1312.0	20A/1P	15				16	20A/1P	0.0		Spare
Spare		0.0	20A/1P	17				18	20A/1P	0.0		Spare
Spare		0.0	20A/1P	19				20	20A/1P	0.0		Spare
Spare		0.0	20A/1P	21				22	20A/1P	0.0		Spare
Spare		0.0	20A/1P	23				24	20A/1P	0.0		Spare
Spare		0.0	20A/1P	25				26	20A/1P	0.0		Spare
Spare		0.0	20A/1P	27				28	20A/1P	0.0		Spare
Spare		0.0	20A/1P	29				30	20A/1P	0.0		Spare
Spare		0.0	20A/1P	31				32	20A/1P	0.0		Spare
Spare		0.0	20A/1P	33				34	20A/1P	0.0		Spare
Spare		0.0	20A/1P	35				36	20A/1P	0.0		Spare
Spare		0.0	20A/1P	37				38	20A/1P	0.0		Spare
Spare		0.0	20A/1P	39				40	20A/1P	0.0		Spare
Spare		0.0	20A/1P	41				42	20A/1P	0.0		Spare
SUB-TOTAL	A PHASE	4461.0		B PHASE						4059.0	C PHASE	2694.0
TOTAL CONNECTED LOAD (WATTS)		11214.0									DEMAND LOAD	10092.6

LS42												
VOLTAGE			TAG							TYPE PANEL		FEED
MOUNTING			LOCATION							C/B MIN	AIC	
SIZE/TYPE BUS										OPTIONS/ACCESSRS		
SIZE/TYPE MAINS										REMARKS		
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION
Lighting	Basement	84.0		1				2		1658.0	Basement	Lighting
Lighting	2nd Floor	1155.0		3				4		1370.0	Basement	Lighting
Lighting	2nd Floor	1230.0		5				6		1383.0	First Floor	Lighting
Lighting	Stairwell	390.0		7				8		639.0	First Floor	Lighting
Lighting	Stairwell	280.0		9				10		105.0	First Floor	Lighting
Spare		0.0		11				12		90.0	First Floor	Lighting
Spare		0.0		13				14		418.0	Third Floor	Lighting
Spare		0.0		15				16		540.0	Third Floor	Lighting
Spare		0.0		17				18		0.0		Spare
Spare		0.0		19				20		0.0		Spare
Spare		0.0		21				22		0.0		Spare
Spare		0.0		23				24		0.0		Spare
Spare		0.0		25				26		0.0		Spare
Spare		0.0		27				28		0.0		Spare
Spare		0.0		29				30		0.0		Spare
SUB-TOTAL	A PHASE	3189.0		B PHASE						3450.0	C PHASE	2703.0
TOTAL CONNECTED LOAD (WATTS)		9342.0									DEMAND LOAD	8407.8

LOUNGE SPACE

The student lounge space and main staircase of the building span the curved, south-facing wall on the first floor. The area is a main circulation space in the building, and is open to students to use for studying or relaxing during the daytime as well as in the evening. The exterior of the south facing wall is floor-to-ceiling glazing, with exterior sun shades to reduce the amount of direct sunlight in the space during the day. The ceiling height is 14'-0" over the lounge area, 15'0" over the staircase and 8'0" under the staircase.



ELECTRICAL CHARACTERISTICS

The student lounge is currently served by two branch circuits from panelboard LP4B, with emergency lighting coming from panelboard LS42. The panelboard LP4B is located in the basement electrical room 010 (E-600) and panelboard LS42 is located in the second floor electrical closet EC-201 (E-600).

With the existing design, the total load for panelboard LP4B from the lounge space is 1730 W, with 1100 W on branch circuit LP4B-7 and 630 W on branch circuit LP4B-9. The total load for panelboard LS42 is 540 W on branch circuit LS42-6. The new design has a total load of 2012 W, which will be divided into 1420 W on branch circuit LP4B-7 and 536 W on branch circuit LS42-6.

Student Lounge : New Lighting Load Calculations

Fixture	Mounting	W	VA	A	PF	QTY	Total W	Total VA	Total A	Circuits
F1	Recessed	120	102.49	0.39	1.0	8	960	819.92	3.12	LP4B-7 LS42-6
F2	Surface	4	58.17	0.21	1.0	10	40	581.70	2.10	LP4B-7
F6	Recessed	28	60.94	0.22	1.0	11	308	670.76	2.42	LP4B-7 LS42-6
F11	Recessed	32	63.71	0.23	1.0	15	480	955.65	3.45	LP4B-7
F14	Surface	28	60.94	0.22	1.0	4	112	243.76	0.88	LP4B-7
F15	Surface	56	60.94	0.22	1.0	2	112	121.88	0.44	LP4B-7

EXISTING PANELBOARD

LP4B													
VOLTAGE		480Y/277V, 3P, 4W		TAG						TYPE PANEL		FEED	
MOUNTING		Surface		LOCATION						C/B MIN AIC		REMARKS	
SIZE/TYPE BUS		225 A		OPTIONS/ACCESSRS						REMARKS		REMARKS	
SIZE/TYPE MAINS				REMARKS						REMARKS		REMARKS	
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	1596.0	20A/1P	1				2	20A/1P	0.0		Spare	
Lighting	Basement	482.0	20A/1P	3				4	20A/1P	0.0		Spare	
Lighting	Basement	1194.0	20A/1P	5				6	20A/1P	0.0		Spare	
Lighting	Lounge	1100.0	20A/1P	7				8	20A/1P	0.0		Spare	
Lighting	Lounge, Serving A	2265.0	20A/1P	9				10	20A/1P	0.0		Spare	
Lighting	Serving Area	1500.0	20A/1P	11				12	20A/1P	0.0		Spare	
Lighting	Serving Area	1765.0	20A/1P	13				14	20A/1P	0.0		Spare	
Lighting	Conf Room	1312.0	20A/1P	15				16	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	17				18	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	19				20	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	21				22	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	23				24	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	25				26	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	27				28	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	29				30	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	31				32	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	33				34	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	35				36	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	37				38	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	39				40	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	41				42	20A/1P	0.0		Spare	
SUB-TOTAL		A PHASE	4461.0	B PHASE				4059.0		C PHASE	2694.0		
TOTAL CONNECTED LOAD (WATTS)		11214.0								DEMAND LOAD		10092.6	

LS42													
VOLTAGE				TAG						TYPE PANEL		FEED	
MOUNTING				LOCATION						C/B MIN AIC		REMARKS	
SIZE/TYPE BUS				OPTIONS/ACCESSRS						REMARKS		REMARKS	
SIZE/TYPE MAINS				REMARKS						REMARKS		REMARKS	
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	84.0		1				2		1658.0	Basement	Lighting	
Lighting	2nd Floor	1155.0		3				4		1370.0	Basement	Lighting	
Lighting	2nd Floor	1230.0		5				6		1367.0	First Floor	Lighting	
Lighting	Stairwell	390.0		7				8		639.0	First Floor	Lighting	
Lighting	Stairwell	280.0		9				10		105.0	First Floor	Lighting	
Spare		0.0		11				12		90.0	First Floor	Lighting	
Spare		0.0		13				14		418.0	Third Floor	Lighting	
Spare		0.0		15				16		540.0	Third Floor	Lighting	
Spare		0.0		17				18		0.0		Spare	
Spare		0.0		19				20		0.0		Spare	
Spare		0.0		21				22		0.0		Spare	
Spare		0.0		23				24		0.0		Spare	
Spare		0.0		25				26		0.0		Spare	
Spare		0.0		27				28		0.0		Spare	
Spare		0.0		29				30		0.0		Spare	
Spare		0.0		31				32		0.0		Spare	
Spare		0.0		33				34		0.0		Spare	
Spare		0.0		35				36		0.0		Spare	
Spare		0.0		37				38		0.0		Spare	
Spare		0.0		39				40		0.0		Spare	
Spare		0.0		41				42		0.0		Spare	
SUB-TOTAL		A PHASE	3189.0	B PHASE				3450.0		C PHASE	2687.0		
TOTAL CONNECTED LOAD (WATTS)		9326.0								DEMAND LOAD		8393.4	

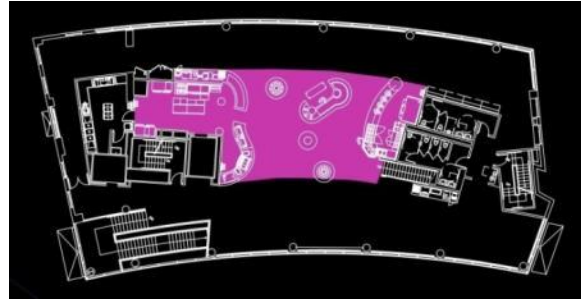
REDESIGNED PANELBOARD

LP4B													
VOLTAGE	480Y/277V, 3P, 4W				TAG					TYPE PANEL			
MOUNTING	Surface				LOCATION					C/B MIN	AIC	FEED	
SIZE/TYPE BUS										OPTIONS/ACCESSRS			
SIZE/TYPE MAINS										REMARKS			
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	1596.0	20A/1P	1	*			2	20A/1P	0.0		Spare	
Lighting	Basement	482.0	20A/1P	3		*		4	20A/1P	0.0		Spare	
Lighting	Basement	1194.0	20A/1P	5			*	6	20A/1P	0.0		Spare	
Lighting	Lounge	1420.0	20A/1P	7	*			8	20A/1P	0.0		Spare	
Lighting	Serving Area	1635.0	20A/1P	9		*		10	20A/1P	0.0		Spare	
Lighting	Serving Area	1500.0	20A/1P	11			*	12	20A/1P	0.0		Spare	
Lighting	Lounge	1765.0	20A/1P	13	*			14	20A/1P	0.0		Spare	
Lighting	Conf Room	1529.0	20A/1P	15		*		16	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	17			*	18	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	19	*			20	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	21		*		22	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	23			*	24	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	25	*			26	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	27		*		28	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	29			*	30	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	31	*			32	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	33		*		34	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	35			*	36	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	37	*			38	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	39		*		40	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	41			*	42	20A/1P	0.0		Spare	
SUB-TOTAL	A PHASE	4781.0		B PHASE						3646.0	C PHASE	2694.0	
TOTAL CONNECTED LOAD (WATTS)		11121.0									DEMAND LOAD	10008.9	

LS42													
VOLTAGE					TAG					TYPE PANEL			
MOUNTING					LOCATION					C/B MIN	AIC	FEED	
SIZE/TYPE BUS										OPTIONS/ACCESSRS			
SIZE/TYPE MAINS										REMARKS			
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	84.0		1	*			2		1658.0	Basement	Lighting	
Lighting	2nd Floor	1155.0		3		*		4		1370.0	Basement	Lighting	
Lighting	2nd Floor	1230.0		5			*	6		1277.0	First Floor	Lighting	
Lighting	Stairwell	390.0		7	*			8		639.0	First Floor	Lighting	
Lighting	Stairwell	280.0		9		*		10		105.0	First Floor	Lighting	
Spare		0.0		11			*	12		90.0	First Floor	Lighting	
Spare		0.0		13	*			14		418.0	Third Floor	Lighting	
Spare		0.0		15		*		16		540.0	Third Floor	Lighting	
Spare		0.0		17			*	18		0.0		Spare	
Spare		0.0		19	*			20		0.0		Spare	
Spare		0.0		21		*		22		0.0		Spare	
Spare		0.0		23			*	24		0.0		Spare	
Spare		0.0		25	*			26		0.0		Spare	
Spare		0.0		27		*		28		0.0		Spare	
Spare		0.0		29			*	30		0.0		Spare	
Spare		0.0		31	*			32		0.0		Spare	
Spare		0.0		33		*		34		0.0		Spare	
Spare		0.0		35			*	36		0.0		Spare	
Spare		0.0		37	*			38		0.0		Spare	
Spare		0.0		39		*		40		0.0		Spare	
Spare		0.0		41			*	42		0.0		Spare	
SUB-TOTAL	A PHASE	3189.0		B PHASE						3450.0	C PHASE	2597.0	
TOTAL CONNECTED LOAD (WATTS)		9236.0									DEMAND LOAD	8912.4	

CAFETERIA SERVING SPACE

The main campus cafeteria serving area is located on the second floor of the building. Students will gather here for meals and snacks. The space features curved serving bars, round condiment stations, and kitchen and cooking areas. In the center of the space is a specialty bar, with made-to-order items. The space will also have movable tables and chairs for students to eat. The ceiling height is 8'-0" and is suspended 2x4 acoustical ceiling tile. The north and south sides are open to the hallway, while the east and west walls are painted gypsum wall board.



ELECTRICAL CHARACTERISTICS

The cafeteria serving space is currently served by one branch circuit from panelboard LP4B, with emergency lighting coming served by two branch circuits from panelboard LS42. The panelboard LP4B is located in the basement electrical room 010 (E-600) and panelboard LS42 is located in the second floor electrical closet EC-201 (E-600).

With the existing design, the total load for panelboard LP4B from the cafeteria serving space is 1590 W, with 1095 W on branch circuit LP4B-9, 315 W on branch circuit LS24-3 and 180 W on branch circuit LS24-5. The new design has a total load of 1521 W, which will be divided into 1241 W on branch circuit LP4B-9 and 280 W on branch circuit LS42-3.

Cafeteria Serving Space : New Lighting Load Calculations

Fixture	Mounting	W	VA	A	PF	QTY	Total W	Total VA	Total A	Circuits
F4	Recessed	28	60.94	0.22	1.0	23	644	1401.662	5.06	LP4B-9 LS24-3
F5	Recessed	63	63.71	0.23	1.0	3	189	191.13	0.69	LP4B-9
F9	Pendant	20	38.78	0.14	1.0	21	420	814.38	2.94	LP4B-9
F10	Pendant	4	55.40	0.20	1.0	11	44	609.40	2.20	LP4B-9
F11	Recessed	32	63.71	0.23	1.0	7	224	445.97	1.61	LP4B-9

EXISTING PANELBOARDS

LP4B													
VOLTAGE	480Y/277V, 3P, 4W				TAG					TYPE PANEL			
MOUNTING	Surface				LOCATION					C/B MIN	AIC	FEED	
SIZE/TYPE BUS	225 A				REMARKS					OPTIONS/ACCESSRS			
SIZE/TYPE MAINS													
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	1596.0	20A/1P	1				2	20A/1P	0.0		Spare	
Lighting	Basement	482.0	20A/1P	3				4	20A/1P	0.0		Spare	
Lighting	Basement	1194.0	20A/1P	5				6	20A/1P	0.0		Spare	
Lighting	Lounge	1668.0	20A/1P	7				8	20A/1P	0.0		Spare	
Lighting	Serving Area, Lou	1635.0	20A/1P	9				10	20A/1P	0.0		Spare	
Lighting	Serving Area	1500.0	20A/1P	11				12	20A/1P	0.0		Spare	
Lighting	Serving Area	1765.0	20A/1P	13				14	20A/1P	0.0		Spare	
Lighting	Conf Room	1312.0	20A/1P	15				16	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	17				18	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	19				20	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	21				22	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	23				24	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	25				26	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	27				28	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	29				30	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	31				32	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	33				34	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	35				36	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	37				38	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	39				40	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	41				42	20A/1P	0.0		Spare	
SUB-TOTAL	A PHASE	5029.0		B PHASE							3429.0	C PHASE	2694.0
TOTAL CONNECTED LOAD (WATTS)		11152.0									DEMAND LOAD	10036.8	

LS42													
VOLTAGE					TAG					TYPE PANEL			
MOUNTING					LOCATION					C/B MIN	AIC	FEED	
SIZE/TYPE BUS					REMARKS					OPTIONS/ACCESSRS			
SIZE/TYPE MAINS													
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	84.0		1				2		1658.0	Basement	Lighting	
Lighting	2nd Floor	1120.0		3				4		1370.0	Basement	Lighting	
Lighting	2nd Floor	1050.0		5				6		1367.0	First Floor	Lighting	
Lighting	Stairwell	390.0		7				8		639.0	First Floor	Lighting	
Lighting	Stairwell	280.0		9				10		105.0	First Floor	Lighting	
Spare		0.0		11				12		90.0	First Floor	Lighting	
Spare		0.0		13				14		418.0	Third Floor	Lighting	
Spare		0.0		15				16		540.0	Third Floor	Lighting	
Spare		0.0		17				18		0.0		Spare	
Spare		0.0		19				20		0.0		Spare	
Spare		0.0		21				22		0.0		Spare	
Spare		0.0		23				24		0.0		Spare	
Spare		0.0		25				26		0.0		Spare	
Spare		0.0		27				28		0.0		Spare	
Spare		0.0		29				30		0.0		Spare	
SUB-TOTAL	A PHASE	3189.0		B PHASE							3415.0	C PHASE	2507.0
TOTAL CONNECTED LOAD (WATTS)		9111.0									DEMAND LOAD	8199.9	

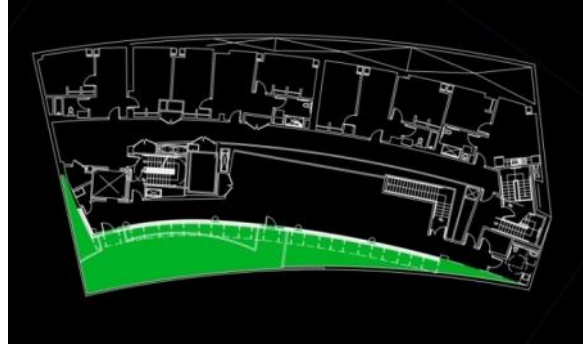
REDESIGNED PANELBOARDS

LP4B													
VOLTAGE		480Y/277V, 3P, 4W		TAG						TYPE PANEL			
MOUNTING		Surface		LOCATION						C/B MIN	AIC	FEED	
SIZE/TYPE BUS										OPTIONS/ACCESSRS			
SIZE/TYPE MAINS										REMARKS			
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	1596.0	20A/1P	1				2	20A/1P	0.0		Spare	
Lighting	Basement	482.0	20A/1P	3				4	20A/1P	0.0		Spare	
Lighting	Basement	1194.0	20A/1P	5			*	6	20A/1P	0.0		Spare	
Lighting	Lounge	1668.0	20A/1P	7				8	20A/1P	0.0		Spare	
Lighting	Serving Area, Lou	1781.0	20A/1P	9			*	10	20A/1P	0.0		Spare	
Lighting	Serving Area	1500.0	20A/1P	11			*	12	20A/1P	0.0		Spare	
Lighting	Serving Area	1765.0	20A/1P	13				14	20A/1P	0.0		Spare	
Lighting	Conf Room	1312.0	20A/1P	15			*	16	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	17			*	18	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	19			*	20	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	21			*	22	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	23			*	24	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	25			*	26	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	27			*	28	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	29			*	30	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	31			*	32	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	33			*	34	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	35			*	36	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	37			*	38	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	39			*	40	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	41			*	42	20A/1P	0.0		Spare	
SUB-TOTAL		A PHASE		5029.0		B PHASE		3575.0		C PHASE		2694.0	
TOTAL CONNECTED LOAD (WATTS)		11298.0								DEMAND LOAD		10168.2	

LS42													
VOLTAGE				TAG						TYPE PANEL			
MOUNTING				LOCATION						C/B MIN	AIC	FEED	
SIZE/TYPE BUS										OPTIONS/ACCESSRS			
SIZE/TYPE MAINS										REMARKS			
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	84.0		1				2		1658.0	Basement	Lighting	
Lighting	2nd Floor	1155.0		3				4		1370.0	Basement	Lighting	
Lighting	2nd Floor	1230.0		5			*	6		1367.0	First Floor	Lighting	
Lighting	Stairwell	390.0		7				8		639.0	First Floor	Lighting	
Lighting	Stairwell	280.0		9			*	10		105.0	First Floor	Lighting	
Spare		0.0		11			*	12		90.0	First Floor	Lighting	
Spare		0.0		13			*	14		418.0	Third Floor	Lighting	
Spare		0.0		15			*	16		540.0	Third Floor	Lighting	
Spare		0.0		17			*	18		0.0		Spare	
Spare		0.0		19			*	20		0.0		Spare	
Spare		0.0		21			*	22		0.0		Spare	
Spare		0.0		23			*	24		0.0		Spare	
Spare		0.0		25			*	26		0.0		Spare	
Spare		0.0		27			*	28		0.0		Spare	
Spare		0.0		29			*	30		0.0		Spare	
Spare		0.0		31			*	32		0.0		Spare	
Spare		0.0		33			*	34		0.0		Spare	
Spare		0.0		35			*	36		0.0		Spare	
Spare		0.0		37			*	38		0.0		Spare	
Spare		0.0		39			*	40		0.0		Spare	
Spare		0.0		41			*	42		0.0		Spare	
SUB-TOTAL		A PHASE		3189.0		B PHASE		3450.0		C PHASE		2687.0	
TOTAL CONNECTED LOAD (WATTS)		9326.0								DEMAND LOAD		8393.4	

ROOF DECK

The third floor outdoor deck is located on the south facing side of the building. The deck features vegetation areas, potted plants and 874 ft² of patio space. The exterior wall is glazing with aluminum framing. Students will be able to use this space for studying and relaxing. The flooring is roof pavers, and the vegetation boxes are concrete unit pavers



on a pedestal system with granite coping at the joints which may be used as seating for occupants. There is currently no lighting system in place on the roof deck, but it would be an ideal place to illuminate during the evening for students to sit and relax.

ELECTRICAL CHARACTERISTICS

The roof deck is currently not served by any panelboard, since there is currently no lighting in that space.

The new lighting design will bring electricity to the roof deck for the first time. The new design has a total load of 168 W. The load will be connected to panelboard LP4B-11, altering the total load on that circuit to 1668 W.

Roof Deck : New Lighting Load Calculations

Fixture	Mounting	W	VA	A	PF	QTY	Total W	Total VA	Total A	Circuits
F3	Surface	4	55.40	0.20	1.0	10	40	554.00	2.00	LP4B-11
F13	Wall Recessed	16	30.47	0.11	1.0	8	128	243.76	0.88	LP4B-11

EXISTING PANELBOARD

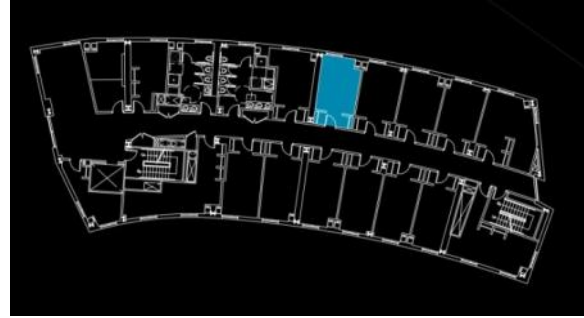
LP4B													
VOLTAGE		480Y/277V, 3P, 4W			TAG					TYPE PANEL			
MOUNTING										C/B MIN	AIC	FEED	
SIZE/TYPE BUS					LOCATION					OPTIONS/ACCESSRS			
SIZE/TYPE MAINS										REMARKS			
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	1596.0	20A/1P	1				2	20A/1P	0.0		Spare	
Lighting	Basement	482.0	20A/1P	3				4	20A/1P	0.0		Spare	
Lighting	Basement	1194.0	20A/1P	5				6	20A/1P	0.0		Spare	
Lighting	Lounge	1100.0	20A/1P	7				8	20A/1P	0.0		Spare	
Lighting	Lounge, Serving A	2265.0	20A/1P	9				10	20A/1P	0.0		Spare	
Lighting	Serving Area	1500.0	20A/1P	11				12	20A/1P	0.0		Spare	
Lighting	Serving Area	1765.0	20A/1P	13				14	20A/1P	0.0		Spare	
Lighting	Conf Room	1529.0	20A/1P	15				16	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	17				18	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	19				20	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	21				22	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	23				24	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	25				26	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	27				28	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	29				30	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	31				32	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	33				34	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	35				36	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	37				38	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	39				40	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	41				42	20A/1P	0.0		Spare	
SUB-TOTAL		A PHASE		4461.0		B PHASE				4276.0		C PHASE	2694.0
TOTAL CONNECTED LOAD (WATTS)		11431.0								DEMAND LOAD		10287.9	

REDESIGNED PANELBOARD

LP4B													
VOLTAGE		480Y/277V, 3P, 4W			TAG					TYPE PANEL			
MOUNTING										C/B MIN	AIC	FEED	
SIZE/TYPE BUS					LOCATION					OPTIONS/ACCESSRS			
SIZE/TYPE MAINS										REMARKS			
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	1596.0	20A/1P	1				2	20A/1P	0.0		Spare	
Lighting	Basement	482.0	20A/1P	3				4	20A/1P	0.0		Spare	
Lighting	Basement	1194.0	20A/1P	5				6	20A/1P	0.0		Spare	
Lighting	Lounge	1100.0	20A/1P	7				8	20A/1P	0.0		Spare	
Lighting	Lounge, Serving A	2265.0	20A/1P	9				10	20A/1P	0.0		Spare	
Lighting	Serving Area	1668.0	20A/1P	11				12	20A/1P	0.0		Spare	
Lighting	Serving Area	1765.0	20A/1P	13				14	20A/1P	0.0		Spare	
Lighting	Conf Room	1529.0	20A/1P	15				16	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	17				18	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	19				20	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	21				22	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	23				24	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	25				26	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	27				28	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	29				30	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	31				32	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	33				34	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	35				36	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	37				38	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	39				40	20A/1P	0.0		Spare	
Spare		0.0	20A/1P	41				42	20A/1P	0.0		Spare	
SUB-TOTAL		A PHASE		4461.0		B PHASE				4276.0		C PHASE	2862.0
TOTAL CONNECTED LOAD (WATTS)		11599.0								DEMAND LOAD		10439.1	

TYPICAL DORM ROOM

The typical two-bed student dorm rooms are located on the fourth and fifth floors of the building. The dorm rooms are used as sleeping, studying and living areas for student residents. The rooms feature two beds, two closets and two desks. The rooms are approximately 240 square feet, with 8'-0" ceiling height, but the square footage may vary due to the shape of the building. The walls are gypsum wall board, and the ceilings are suspended gypsum wall board. The luminaires in the dorm rooms are simple surface mounted fixtures. There are two luminaires in the center of the room for general ambient light, and one over each closet for task lighting.



ELECTRICAL CHARACTERISTICS

The dorm room lighting on the fourth floor is currently served by RP24, an 84-pole panelboard. The lighting for all of the dorm rooms is divided between branches 56, 58 and 60.

The previous lighting design had 152 W per dorm room. The lighting loads on the branch circuits were 720 W on circuit RP24-56, 816 W on circuit RP24-58 and 988 W on circuit RP24-60. The new design has a load of 240 W per room. The load on the circuits will change to 1014 W on branch circuit RP24-56, 1200 W on RP24-58 and 1440 W on RP24-60.

Dorm Room : New Lighting Load Calculations

Fixture	Mounting	W	VA	A	PF	QTY	Total W	Total VA	Total A	Circuits
F12	Surface	30	66.0	0.55	1.0	2	60	132.0	1.1	RP24-56 RP24-58 RP24-60
F15	Surface	54	60.0	0.50	1.0	1	54	60.0	0.50	RP24-56 RP24-58 RP24-60
F16	Surface	63	66.0	0.55	1.0	2	126	132.0	1.1	RP24-56 RP24-58 RP24-60

EXISTING PANELBOARD

RP24												
VOLTAGE			TAG							TYPE PANEL		
MOUNTING			LOCATION							C/B MIN	AIC	FEED
SIZE/TYPER BUS			REMARKS							OPTIONS/ACCESSRS		
SIZE/TYPER MAINS												
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION
Receptacles	Laundry Room	1500.0	20A 1P	1				2	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	3				4	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	5				6	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	7				8	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	9				10	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	11				12	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	13				14	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	15				16	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	17				18	20A 1P	0.0		Spare
Receptacles	Dorm Rooms	360.0	20A 1P	19				20	20A 1P	0.0		Spare
Receptacles	Dorm Rooms	360.0	20A 1P	21				22	20A 1P	540.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	23				24	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	25				26	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	27				28	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	29				30	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	180.0	20A 1P	31				32	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	33				34	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	35				36	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	37				38	20A 1P	180.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	39				40	20A 1P	180.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	41				42	20A 1P	0.0		Spare
Fan Coil Unit	Dorm Rooms	378.0	20A 1P	43				44	20A 1P	540.0	Hallway	Receptacles
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	45				46	20A 1P	540.0	Hallway	Receptacles
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	47				48	20A 1P	378.0	Dorm Rooms	Fan Coil Unit
Fan Coil Unit	Dorm Rooms	236.0	20A 1P	49				50	20A 1P	354.0	Dorm Rooms	Fan Coil Unit
Spare		0.0	20A 1P	51				52	20A 1P	556.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	53				54	20A 1P	142.0	Dorm Rooms	Fan Coil Unit
Spare		0.0	20A 1P	55				56	20A 1P	720.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	57				58	20A 1P	816.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	59				60	20A 1P	988.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	61				62	20A 1P	0.0		Spare
Spare		0.0	20A 1P	63				64	20A 1P	0.0		Spare
Spare		0.0	20A 1P	65				66	20A 1P	0.0		Spare
Spare		0.0	20A 1P	67				68	20A 1P	0.0		Spare
Spare		0.0	20A 1P	69				70	20A 1P	0.0		Spare
Spare		0.0	20A 1P	71				72	20A 1P	0.0		Spare
Spare		0.0	20A 1P	73				74	20A 1P	0.0		Spare
Spare		0.0	20A 1P	75				76	20A 1P	0.0		Spare
Spare		0.0	20A 1P	77				78	20A 1P	0.0		Spare
Spare		0.0	20A 1P	79				80	20A 1P	0.0		Spare
Spare		0.0	20A 1P	81				82	20A 1P	0.0		Spare
Spare		0.0	20A 1P	83				84	20A 1P	0.0		Spare
SUB-TOTAL	A PHASE	18028.0		B PHASE						13426.0	C PHASE	10922.0
TOTAL CONNECTED LOAD (WATTS)		36476.0									DEMAND LOAD	32828.4

REDESIGNED PANELBOARD

RP24												
VOLTAGE				TAG						TYPE PANEL		
MOUNTING										C/B MIN	AIC	FEED
SIZE/TYPE BUS				LOCATION						OPTIONS/ACCESSRS		
SIZE/TYPE MAINS										REMARKS		
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION
Receptacles	Laundry Room	1500.0	20A 1P	1				2	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	3				4	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	5				6	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	7				8	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	9				10	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	11				12	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	13				14	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	15				16	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	17				18	20A 1P	0.0		Spare
Receptacles	Dorm Rooms	360.0	20A 1P	19				20	20A 1P	0.0		Spare
Receptacles	Dorm Rooms	360.0	20A 1P	21				22	20A 1P	540.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	23				24	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	25				26	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	27				28	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	29				30	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	180.0	20A 1P	31				32	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	33				34	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	35				36	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	37				38	20A 1P	180.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	39				40	20A 1P	180.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	41				42	20A 1P	0.0		Spare
Fan Coil Unit	Dorm Rooms	378.0	20A 1P	43				44	20A 1P	540.0	Hallway	Receptacles
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	45				46	20A 1P	540.0	Hallway	Receptacles
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	47				48	20A 1P	378.0	Dorm Rooms	Fan Coil Unit
Fan Coil Unit	Dorm Rooms	236.0	20A 1P	49				50	20A 1P	354.0	Dorm Rooms	Fan Coil Unit
Spare		0.0	20A 1P	51				52	20A 1P	556.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	53				54	20A 1P	142.0	Dorm Rooms	Fan Coil Unit
Spare		0.0	20A 1P	55				56	20A 1P	1014.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	57				58	20A 1P	1200.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	59				60	20A 1P	1440.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	61				62	20A 1P	0.0		Spare
Spare		0.0	20A 1P	63				64	20A 1P	0.0		Spare
Spare		0.0	20A 1P	65				66	20A 1P	0.0		Spare
Spare		0.0	20A 1P	67				68	20A 1P	0.0		Spare
Spare		0.0	20A 1P	69				70	20A 1P	0.0		Spare
Spare		0.0	20A 1P	71				72	20A 1P	0.0		Spare
Spare		0.0	20A 1P	73				74	20A 1P	0.0		Spare
Spare		0.0	20A 1P	75				76	20A 1P	0.0		Spare
Spare		0.0	20A 1P	77				78	20A 1P	0.0		Spare
Spare		0.0	20A 1P	79				80	20A 1P	0.0		Spare
Spare		0.0	20A 1P	81				82	20A 1P	0.0		Spare
Spare		0.0	20A 1P	83				84	20A 1P	0.0		Spare
SUB-TOTAL	A PHASE	13028.0		B PHASE						13426.0	C PHASE	10022.0
TOTAL CONNECTED LOAD (WATTS)		36476.0									DEMAND LOAD	32826.4

FEEDER SIZING

LP4B														
VOLTAGE	480Y/277V, 3P, 4W			TAG						TYPE PANEL		FEED		
MOUNTING	Surface			LOCATION						C/B MIN	AIC			
SIZE/TYPE BUS										OPTIONS/ACCESSRS				
SIZE/TYPE MAINS										REMARKS				
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION		
Lighting	Basement	1596.0	20A/1P	1				2	20A/1P	0.0		Spare		
Lighting	Basement	482.0	20A/1P	3				4	20A/1P	0.0		Spare		
Lighting	Basement	1194.0	20A/1P	5				6	20A/1P	0.0		Spare		
Lighting	Lounge	1420.0	20A/1P	7				8	20A/1P	0.0		Spare		
Lighting	Lounge, Serving A	1781.0	20A/1P	9				10	20A/1P	0.0		Spare		
Lighting	Serving Area	1668.0	20A/1P	11				12	20A/1P	0.0		Spare		
Lighting	Serving Area	1765.0	20A/1P	13				14	20A/1P	0.0		Spare		
Lighting	Conf Room	1312.0	20A/1P	15				16	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	17				18	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	19				20	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	21				22	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	23				24	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	25				26	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	27				28	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	29				30	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	31				32	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	33				34	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	35				36	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	37				38	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	39				40	20A/1P	0.0		Spare		
Spare		0.0	20A/1P	41				42	20A/1P	0.0		Spare		
SUB-TOTAL	A PHASE	4781.0		B PHASE				3575.0	C PHASE	2862.0				
TOTAL CONNECTED LOAD (WATTS)		11218.0							DEMAND LOAD			10096.2		

LP4B Feeder Redesign

Demand Load	10096.2 W		
Voltage	480/277V		
Design Load	36.4 A	+25% Spare Capacity	45.6 A
Circuit Breaker	Conductors	Neutral	Ground
50 A	(3) #8 CU THHN	(1) #8 CU THHN	(1) #10 CU
			½"

LS42													
VOLTAGE			TAG						TYPE PANEL				
MOUNTING									C/B MIN		AIC		FEED
SIZE/TYPE BUS			LOCATION						OPTIONS/ACCESSRS				
SIZE/TYPE MAINS									REMARKS				
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Lighting	Basement	84.0		1				2		1658.0	Basement	Lighting	
Lighting	2nd Floor	1155.0		3				4		1370.0	Basement	Lighting	
Lighting	2nd Floor	1230.0		5				6		1293.0	First Floor	Lighting	
Lighting	Stairwell	390.0		7				8		639.0	First Floor	Lighting	
Lighting	Stairwell	280.0		9		*		10		105.0	First Floor	Lighting	
Spare		0.0		11				12		90.0	First Floor	Lighting	
Spare		0.0		13	*			14		418.0	Third Floor	Lighting	
Spare		0.0		15				16		540.0	Third Floor	Lighting	
Spare		0.0		17			*	18		0.0		Spare	
Spare		0.0		19	*			20		0.0		Spare	
Spare		0.0		21		*		22		0.0		Spare	
Spare		0.0		23			*	24		0.0		Spare	
Spare		0.0		25	*			26		0.0		Spare	
Spare		0.0		27		*		28		0.0		Spare	
Spare		0.0		29			*	30		0.0		Spare	
Spare		0.0		31	*			32		0.0		Spare	
Spare		0.0		33		*		34		0.0		Spare	
Spare		0.0		35			*	36		0.0		Spare	
Spare		0.0		37	*			38		0.0		Spare	
Spare		0.0		39		*		40		0.0		Spare	
Spare		0.0		41			*	42		0.0		Spare	
SUB TOTAL	A PHASE	3189.0		B PHASE						3450.0	C PHASE	2613.0	
TOTAL CONNECTED LOAD (WATTS)		9252.0								DEMAND LOAD		8326.8	

LS42 Feeder Redesign

Demand Load	8326.8 W		
Voltage	480/277V		
Design Load	30.06 A	+25% Spare Capacity	37.58 A
Circuit Breaker	Conductors	Neutral	Ground
40 A	(3) #8 CU THHN	(1) #8 CU THHN	(1) #10 CU
			1/2"

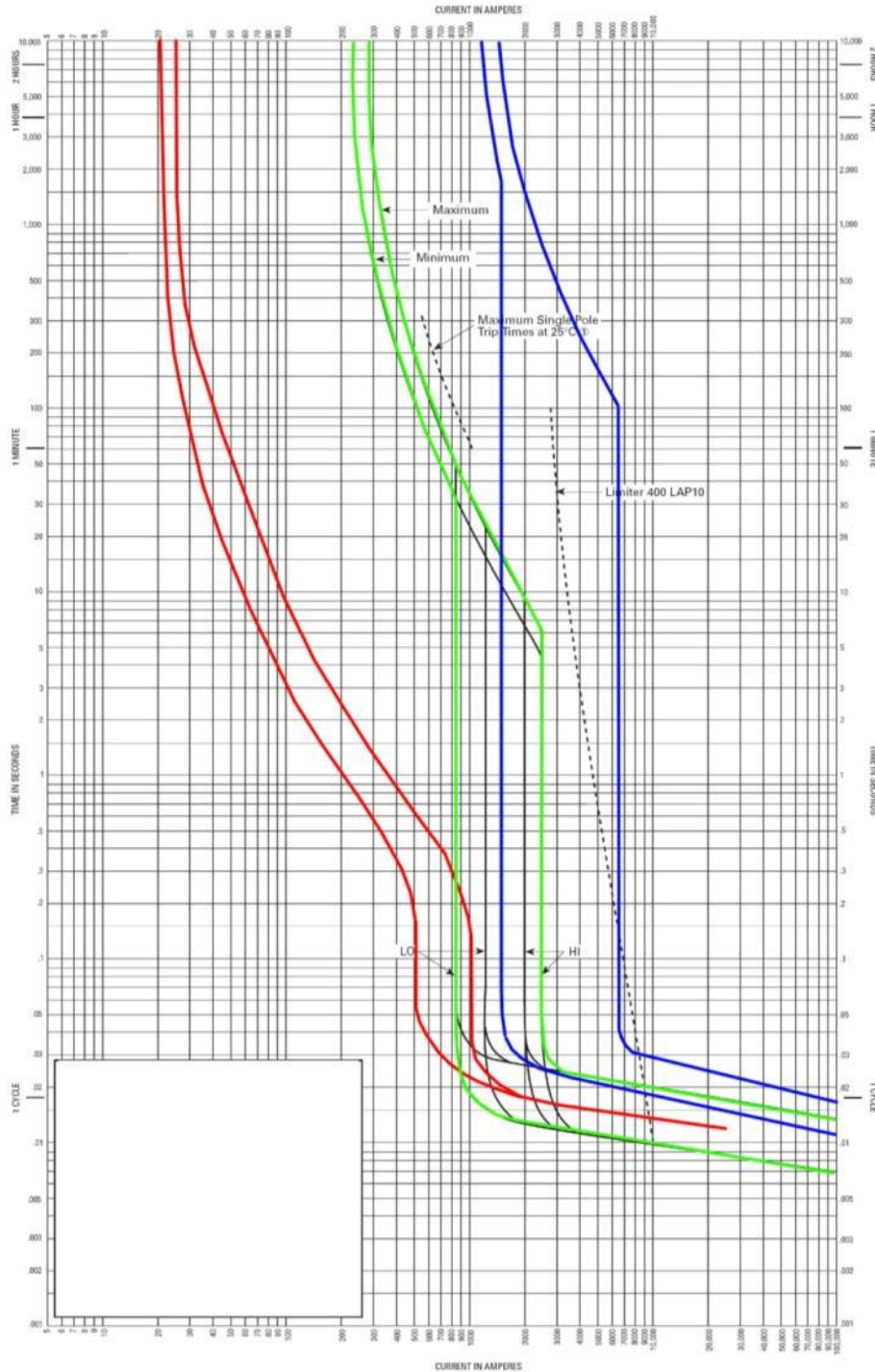
RP24												
VOLTAGE			TAG						TYPE PANEL			FEED
MOUNTING			LOCATION						C/B MIN AIC			FEED
SIZE/TYPER BUS			LOCATION						OPTIONS/ACCESSRS			REMARKS
SIZE/TYPER MAINS			LOCATION						REMARKS			LOAD
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION
Receptacles	Laundry Room	1500.0	20A 1P	1				2	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	3				4	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	5				6	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	7				8	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	9				10	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	11				12	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	13				14	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	15				16	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	17				18	20A 1P	0.0		Spare
Receptacles	Dorm Rooms	360.0	20A 1P	19				20	20A 1P	0.0		Spare
Receptacles	Dorm Rooms	360.0	20A 1P	21				22	20A 1P	540.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	23				24	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	25				26	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	27				28	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	29				30	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	180.0	20A 1P	31				32	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	33				34	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	35				36	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	37				38	20A 1P	180.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	39				40	20A 1P	180.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	41				42	20A 1P	0.0		Spare
Fan Coil Unit	Dorm Rooms	378.0	20A 1P	43				44	20A 1P	540.0	Hallway	Receptacles
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	45				46	20A 1P	540.0	Hallway	Receptacles
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	47				48	20A 1P	378.0	Dorm Rooms	Fan Coil Unit
Fan Coil Unit	Dorm Rooms	236.0	20A 1P	49				50	20A 1P	354.0	Dorm Rooms	Fan Coil Unit
Spare		0.0	20A 1P	51				52	20A 1P	556.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	53				54	20A 1P	142.0	Dorm Rooms	Fan Coil Unit
Spare		0.0	20A 1P	55				56	20A 1P	720.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	57				58	20A 1P	816.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	59				60	20A 1P	988.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	61				62	20A 1P	0.0		Spare
Spare		0.0	20A 1P	63				64	20A 1P	0.0		Spare
Spare		0.0	20A 1P	65				66	20A 1P	0.0		Spare
Spare		0.0	20A 1P	67				68	20A 1P	0.0		Spare
Spare		0.0	20A 1P	69				70	20A 1P	0.0		Spare
Spare		0.0	20A 1P	71				72	20A 1P	0.0		Spare
Spare		0.0	20A 1P	73				74	20A 1P	0.0		Spare
Spare		0.0	20A 1P	75				76	20A 1P	0.0		Spare
Spare		0.0	20A 1P	77				78	20A 1P	0.0		Spare
Spare		0.0	20A 1P	79				80	20A 1P	0.0		Spare
Spare		0.0	20A 1P	81				82	20A 1P	0.0		Spare
Spare		0.0	20A 1P	83				84	20A 1P	0.0		Spare
SUB-TOTAL	A PHASE	13023.0		B PHASE						13426.0	C PHASE	10022.0
TOTAL CONNECTED LOAD (WATTS)		36475.0									DEMAND LOAD	32828.4

RP24 Feeder Redesign

Demand Load	32828.4 W		
Voltage	208/120V		
Design Load	273.57 A	+25% Spare Capacity	341.96 A
Circuit Breaker	Conductors	Neutral	Ground
400 A	(6) #2/0 CU THHN	(2) #2/0 CU THHN	(2) #6 CU
			Conduit
			1 1/4"

PROTECTION DEVICE COORDINATION STUDY

Types EDH, FBD, FD and HFD 20 Amperes — Curve No. SC-4135-87B **EATON**
 Type LA, 225 Amperes, 2 and 3 Poles — Curve No. SC-3587-76A
 Type PB, 1600 Amperes, 2 and 3 Poles — Curve No. SC-3602-76B



FAULT CURRENT ANALYSIS

In an electrical system, the smallest overcurrent device should ideally trip first in order to minimize the area of disruption and power loss. The overcurrent devices will be analyzed through a single electrical path, and compared by overlaying time-current curves.

The Campus Center and Student Residence building uses circuit breakers for their overcurrent protection. The path is as follows:

Utility Transformer > Main Switchboard (MSB) > Distribution Panel (LSDP4) > End Use Panel (LS42)

The results show that the current system in the case analyzed has more than specified by the calculations. Distribution panelboard LSDP4 is rated at 42000 AIC, but the calculations result in a need of 10000 AIC. It is likely that the electrical designers were anticipating the need for more equipment throughout the life of the building.

Results of Fault Analysis

Point	Location	Available Fault (A)	Standard Breaker Rating (A)
A	Utility Company Secondary	12,648	14,000
B	Switchboard (MSB)	12,400	14,000
C	Distribution Panel (LSDP4)	9,795	10,000
D	End Use Panel (LS42)	7,971	10,000

Fault Current Analysis (Per Unit Method)						
System Voltage		480				
Base kVA		10,000				
Utility Company Available Fault		100,000	ΣX	ΣR	ΣZ	$I_{sc} (A)$
Utility Primary						
$X_{(p.u.)} = kVA_{base}/Utility\ S.C.\ kVA$		0.100	0.100	0.000	0.100	120281
$R_{(p.u.)}$		0.000				
Transformer Secondary						
%Z = 5.0	$X_{(p.u.)} = \%X * kVA_{base}/100 * kVA_{xfmr}$	0.813	0.813	0.493	0.951	12648
X/R = 2.89	$R_{(p.u.)} = \%R * kVA_{base}/100 * kVA_{xfmr}$	0.493				
%X = 3.05						
%R = 1.85						
kVA = 375						
Switchboard MSB						
Wire = #600	$\%X = (L/1000) * X_L * (1/Sets), X_{(p.u.)}$	0.016	0.829	0.504	0.970	12400
Length = 30'	$\%R = (L/1000) * R * (1/Sets), R_{(p.u.)}$	0.011				
Sets = 3						
X = 0.037						
R = 0.024						
Panelboard LSDP4						
Wire = #4	$\%X = (L/1000) * X_L * (1/Sets), X_{(p.u.)}$	0.055	0.884	0.852	1.228	9795
Length = 25'	$\%R = (L/1000) * R * (1/Sets), R_{(p.u.)}$	0.348				
Sets = 1						
X = 0.051						
R = 0.321						
Panelboard LS42						
Wire = #8	$\%X = (L/1000) * X_L * (1/Sets), X_{(p.u.)}$	0.026	0.910	1.204	1.509	7971
Length = 10'	$\%R = (L/1000) * R * (1/Sets), R_{(p.u.)}$	0.352				
Sets = 1						
X = 0.060						
R = 0.811						

VOLTAGE CHANGE

The third electrical analysis changes the lighting voltages from a combination of 120V and 277V to only 277V. The wire and conduit sizes will be re-evaluated to determine the cost savings available with this change.

The existing lighting in the Wheelock College Campus Center and Student Residence building is a combination of 120 V and 277 V. This study will analyze the benefits of altering the 120 V lighting fixtures to 277 V, to make a completely 277 V system.

The panelboards which will be affected in this redesign are RP23, RP24, RP25 and RP26. Panelboard RP23 serves the receptacle and lighting loads on the third floor, RP24 serves the receptacle and lighting loads on the fourth floor, RP25 serves the receptacle and lighting loads on the fifth floor and RP26 serves the receptacle and lighting loads on the sixth floor. The lighting from panels RP23, RP24, RP25 and RP26 will be re-routed to panelboards LP42 and LP4B. Since the panelboards also serve receptacles, they must be 208/120V.

RP23													
VOLTAGE			TAG						TYPE PANEL			FEED	
MOUNTING			LOCATION						C/B MIN AIC			FEED	
SIZE/TYPER BUS			LOCATION						OPTIONS/ACCESSRS			FEED	
SIZE/TYPER MAINS			REMARKS										
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION	
Receptacles	Dorm Rooms	540.0	20A 1P	1				2	20A 1F	360.0	Dorm Rooms	Receptacles	
Receptacles	Dorm Rooms	360.0	20A 1P	3				4	20A 1F	540.0	Dorm Rooms	Receptacles	
Hot Water Heater	Dorm Rooms	1500.0	20A 1P	5				6	20A 1F	1500.0	Dorm Rooms	Hot Water Heater	
Receptacles	Dorm Rooms	540.0	20A 1P	7				8	20A 1F	540.0	Dorm Rooms	Receptacles	
Receptacles	Dorm Rooms	360.0	20A 1P	9				10	20A 1F	540.0	Dorm Rooms	Receptacles	
Receptacles	Dorm Rooms	360.0	20A 1P	11				12	20A 1F	360.0	Dorm Rooms	Receptacles	
Spare		0.0	20A 1P	13				14	20A 1F	360.0	Dorm Rooms	Receptacles	
Hot Water Heater	Dorm Rooms	1500.0	20A 1P	15				16	20A 1F	1500.0	Dorm Rooms	Refrigerator	
Receptacles	Corridor	1080.0	20A 1P	17				18	20A 1F	1500.0	Dorm Rooms	Receptacles	
Spare		0.0	20A 1P	19				20	50A-2F	1500.0	Dorm Rooms	Stove	
Spare		0.0	20A 1P	21				22	20A 1F	1500.0	Dorm Rooms	Hot Water Heater	
Spare		0.0	20A 1P	23				24	20A 1F	354.0	Dorm Rooms	Fan Coil Unit	
Spare		0.0	20A 1P	25				26	20A 1F	354.0	Dorm Rooms	Fan Coil Unit	
Spare		0.0	20A 1P	27				28	20A 1F	354.0	Dorm Rooms	Fan Coil Unit	
Lighting	Dorm Rooms	940.0	20A 1P	29				30	20A 1F	236.0	Dorm Rooms	Fan Coil Unit	
Lighting	Dorm Rooms	900.0	20A 1P	31				32	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	33				34	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	35				36	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	37				38	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	39				40	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	41				42	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	43				44	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	45				46	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	47				48	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	49				50	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	51				52	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	53				54	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	55				56	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	57				58	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	59				60	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	61				62	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	63				64	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	65				66	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	67				68	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	69				70	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	71				72	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	73				74	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	75				76	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	77				78	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	79				80	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	81				82	20A 1F	0.0		Spare	
Spare		0.0	20A 1P	83				84	20A 1F	0.0		Spare	
SUB-TOTAL			A PHASE	6094.0	B PHASE						5154.0	C PHASE	7830.0
TOTAL CONNECTED LOAD (WATTS)				18078.0								DEMAND LOAD	16270.2

RP23 Feeder Redesign

Demand Load	14614.2 W				
Voltage	208/120V				
Design Load	121.8 A	+25% Spare Capacity			152.2 A
	Circuit Breaker	Conductors	Neutral	Ground	Conduit
Old	200 A	(3) #2/0 CU THHN	(1) #2/0 CU THHN	(1) #6 CU	1"
New	200 A	(3) #1/0 CU THHN	(1) #1/0 CU THHN	(1) #6 CU	1"

RP24												
VOLTAGE			TAG						TYPE PANEL			
MOUNTING			LOCATION						C/B MIN	AIC	FEED	
SIZE/TYPE BUS			LOCATION						OPTIONS/ACCESSRS			
SIZE/TYPE MAINS			REMARKS									
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION
Receptacles	Laundry Room	1500.0	20A 1P	1				2	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	3				4	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	5				6	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	7				8	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	9				10	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	11				12	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	13				14	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Laundry Room	1500.0	20A 1P	15				16	20A 1P	1500.0	Laundry Room	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	17				18	20A 1P	0.0		Spare
Receptacles	Dorm Rooms	360.0	20A 1P	19				20	20A 1P	0.0		Spare
Receptacles	Dorm Rooms	360.0	20A 1P	21				22	20A 1P	540.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	23				24	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	25				26	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	27				28	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	29				30	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	180.0	20A 1P	31				32	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	33				34	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	35				36	20A 1P	360.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	37				38	20A 1P	180.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	39				40	20A 1P	180.0	Dorm Rooms	Receptacles
Spare		0.0	20A 1P	41				42	20A 1P	0.0		Spare
Fan Coil Unit	Dorm Rooms	378.0	20A 1P	43				44	20A 1P	540.0	Hallway	Receptacles
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	45				46	20A 1P	540.0	Hallway	Receptacles
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	47				48	20A 1P	378.0	Dorm Rooms	Fan Coil Unit
Fan Coil Unit	Dorm Rooms	236.0	20A 1P	49				50	20A 1P	354.0	Dorm Rooms	Fan Coil Unit
Spare		0.0	20A 1P	51				52	20A 1P	556.0	Dorm Rooms	Fan Coil Unit
Spare		0.0	20A 1P	53				54	20A 1P	142.0	Dorm Rooms	Fan Coil Unit
Spare		0.0	20A 1P	55				56	20A 1P	720.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	57				58	20A 1P	816.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	59				60	20A 1P	988.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	61				62	20A 1P	0.0		Spare
Spare		0.0	20A 1P	63				64	20A 1P	0.0		Spare
Spare		0.0	20A 1P	65				66	20A 1P	0.0		Spare
Spare		0.0	20A 1P	67				68	20A 1P	0.0		Spare
Spare		0.0	20A 1P	69				70	20A 1P	0.0		Spare
Spare		0.0	20A 1P	71				72	20A 1P	0.0		Spare
Spare		0.0	20A 1P	73				74	20A 1P	0.0		Spare
Spare		0.0	20A 1P	75				76	20A 1P	0.0		Spare
Spare		0.0	20A 1P	77				78	20A 1P	0.0		Spare
Spare		0.0	20A 1P	79				80	20A 1P	0.0		Spare
Spare		0.0	20A 1P	81				82	20A 1P	0.0		Spare
Spare		0.0	20A 1P	83				84	20A 1P	0.0		Spare
SUB-TOTAL	A PHASE	13028.0		B PHASE						13426.0	C PHASE	10022.0
TOTAL CONNECTED LOAD (WATTS)		36476.0									DEMAND LOAD	32828.4

RP24 Feeder Redesign

Demand Load	30556.8 W	
Voltage	208/120V	
Design Load	254.64 A	+25% Spare Capacity 318.3 A
	Circuit Breaker	Conductors
Old	400 A	(6) #2/0 CU THHN
New	400 A	(6) #1/0 CU THHN
	Neutral	Ground
	(2) #2/0 CU THHN	(2) #6 Cu
	Conduit	
	1 ¼"	(2) #6 CU
		1 ¼"

RP25												
VOLTAGE			TAG						TYPE PANEL			FEED
MOUNTING			LOCATION						C/B MIN AIC			FEED
SIZE/TYPER BUS			LOCATION						OPTIONS/ACCESSRS			FEED
SIZE/TYPER MAINS			REMARKS									
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION
Receptacles	Dorm Rooms	360.0	20A 1P	1				2	20A 1P	540.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	3				4	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	5				6	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	7				8	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	9				10	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	11				12	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	13				14	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	15				16	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	360.0	20A 1P	17				18	20A 1P	180.0	Dorm Rooms	Receptacles
Receptacles	Dorm Rooms	180.0	20A 1P	19				20	20A 1P	180.0	Dorm Rooms	Receptacles
Hot Water Heater	Bathroom	1500.0	20A 1P	21				22	20A 1P	540.0	Corridor	Receptacles
Hot Water Heater	Bathroom	1500.0	20A 1P	23				24	20A 1P	360.0	Corridor	Receptacles
Hot Water Heater	Bathroom	1500.0	20A 1P	25				26	20A 1P	378.0	Dorm Rooms	Fan Coil Unit
Hot Water Heater	Bathroom	1500.0	20A 1P	27				28	20A 1P	354.0	Dorm Rooms	Fan Coil Unit
Hot Water Heater	Bathroom	1500.0	20A 1P	29				30	20A 1P	378.0	Dorm Rooms	Fan Coil Unit
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	31				32	20A 1P	720.0	Dorm Rooms	Lighting
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	33				34	20A 1P	816.0	Dorm Rooms	Lighting
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	35				36	20A 1P	988.0	Dorm Rooms	Lighting
Fan Coil Unit	Dorm Rooms	236.0	20A 1P	37				38	20A 1P	456.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	39				40	20A 1P	0.0		Spare
Spare		0.0	20A 1P	41				42	20A 1P	0.0		Spare
Spare		0.0	20A 1P	43				44	20A 1P	0.0		Spare
Spare		0.0	20A 1P	45				46	20A 1P	0.0		Spare
Spare		0.0	20A 1P	47				48	20A 1P	0.0		Spare
Spare		0.0	20A 1P	49				50	20A 1P	0.0		Spare
Spare		0.0	20A 1P	51				52	20A 1P	0.0		Spare
Spare		0.0	20A 1P	53				54	20A 1P	0.0		Spare
Spare		0.0	20A 1P	55				56	20A 1P	0.0		Spare
Spare		0.0	20A 1P	57				58	20A 1P	0.0		Spare
Spare		0.0	20A 1P	59				60	20A 1P	0.0		Spare
Spare		0.0	20A 1P	61				62	20A 1P	0.0		Spare
Spare		0.0	20A 1P	63				64	20A 1P	0.0		Spare
Spare		0.0	20A 1P	65				66	20A 1P	0.0		Spare
Spare		0.0	20A 1P	67				68	20A 1P	0.0		Spare
Spare		0.0	20A 1P	69				70	20A 1P	0.0		Spare
Spare		0.0	20A 1P	71				72	20A 1P	0.0		Spare
Spare		0.0	20A 1P	73				74	20A 1P	0.0		Spare
Spare		0.0	20A 1P	75				76	20A 1P	0.0		Spare
Spare		0.0	20A 1P	77				78	20A 1P	0.0		Spare
Spare		0.0	20A 1P	79				80	20A 1P	0.0		Spare
Spare		0.0	20A 1P	81				82	20A 1P	0.0		Spare
Spare		0.0	20A 1P	83				84	20A 1P	0.0		Spare
SUB-TOTAL	A-PHASE	8344.0		B-PHASE						7224.0	C-PHASE	7060.0
TOTAL CONNECTED LOAD (WATTS)		20628.0									DEMAND LOAD	18566.2

RP25 Feeder Redesign

Demand Load	15883.2 W				
Voltage	208/120V				
Design Load	132.36 A	+25% Spare Capacity			165.45 A
	Circuit Breaker	Conductors	Neutral	Ground	Conduit
Old	200 A	(3) #3/0 CU THHN	(1) #3/0 CU THHN	(1) #6 CU	1 1/4"
New	200 A	(3) #2/0 CU THHN	(1) #2/0 CU THHN	(1) #6 CU	1"

RP26												
VOLTAGE			TAG							TYPE PANEL		
MOUNTING			LOCATION							C/B MIN	AIC	FEED
SIZE/TYPER BUS			REMARKS							OPTIONS/ACCESSRS		
SIZE/TYPER MAINS												
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION
Receptacle	Dorm Rooms	360.0	20A 1P	1				2	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacle	Dorm Rooms	360.0	20A 1P	3				4	20A 1P	360.0	Dorm Rooms	Receptacles
Hot Water Heater	Dorm Rooms	1500.0	20A 1P	5				6	20A 1P	180.0	Dorm Rooms	Receptacles
Receptacle	Dorm Rooms	360.0	20A 1P	7				8	20A 1P	1500.0	Dorm Rooms	Hot Water Heater
Receptacle	Dorm Rooms	360.0	20A 1P	9				10	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacle	Dorm Rooms	360.0	20A 1P	11				12	20A 1P	540.0	Dorm Rooms	Receptacles
Hot Water Heater	Dorm Rooms	1500.0	20A 1P	13				14	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacle	Dorm Rooms	360.0	20A 1P	15				16	20A 1P	1500.0	Dorm Rooms	Hot Water Heater
Receptacle	Dorm Rooms	360.0	20A 1P	17				18	20A 1P	1500.0	Dorm Rooms	Hot Water Heater
Receptacle	Dorm Rooms	540.0	20A 1P	19				20	20A 1P	540.0	Dorm Rooms	Receptacles
Receptacle	Dorm Rooms	360.0	20A 1P	21				22	20A 1P	360.0	Dorm Rooms	Receptacles
Receptacle	Dorm Rooms	360.0	20A 1P	23				24	20A 1P	180.0	Dorm Rooms	Receptacles
Receptacle	Dorm Rooms	540.0	20A 1P	25				26	20A 1P	540.0	Corridor	Receptacles
Hot Water Heater	Dorm Rooms	1500.0	20A 1P	27				28	20A 1P	360.0	Corridor	Receptacles
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	29				30	20A 1P	354.0	Dorm Rooms	Fan Coil Unit
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	31				32	20A 1P	354.0	Dorm Rooms	Fan Coil Unit
Fan Coil Unit	Dorm Rooms	236.0	20A 1P	33				34	20A 1P	354.0	Dorm Rooms	Fan Coil Unit
Fan Coil Unit	Dorm Rooms	354.0	20A 1P	35				36	20A 1P	524.0	Dorm Rooms	Lighting
Fan Coil Unit	Dorm Rooms	118.0	20A 1P	37				38	20A 1P	712.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	39				40	20A 1P	828.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	41				42	20A 1P	724.0	Dorm Rooms	Lighting
Spare		0.0	20A 1P	43				44	20A 1P	0.0		Spare
Spare		0.0	20A 1P	45				46	20A 1P	0.0		Spare
Spare		0.0	20A 1P	47				48	20A 1P	0.0		Spare
Spare		0.0	20A 1P	49				50	20A 1P	0.0		Spare
Spare		0.0	20A 1P	51				52	20A 1P	0.0		Spare
Spare		0.0	20A 1P	53				54	20A 1P	0.0		Spare
Spare		0.0	20A 1P	55				56	20A 1P	0.0		Spare
Spare		0.0	20A 1P	57				58	20A 1P	0.0		Spare
Spare		0.0	20A 1P	59				60	20A 1P	0.0		Spare
Spare		0.0	20A 1P	61				62	20A 1P	0.0		Spare
Spare		0.0	20A 1P	63				64	20A 1P	0.0		Spare
Spare		0.0	20A 1P	65				66	20A 1P	0.0		Spare
Spare		0.0	20A 1P	67				68	20A 1P	0.0		Spare
Spare		0.0	20A 1P	69				70	20A 1P	0.0		Spare
Spare		0.0	20A 1P	71				72	20A 1P	0.0		Spare
Spare		0.0	20A 1P	73				74	20A 1P	0.0		Spare
Spare		0.0	20A 1P	75				76	20A 1P	0.0		Spare
Spare		0.0	20A 1P	77				78	20A 1P	0.0		Spare
Spare		0.0	20A 1P	79				80	20A 1P	0.0		Spare
Spare		0.0	20A 1P	81				82	20A 1P	0.0		Spare
Spare		0.0	20A 1P	83				84	20A 1P	0.0		Spare
SUB-TOTAL	A PHASE	6344.0		B PHASE						7224.0	C PHASE	7060.0
TOTAL CONNECTED LOAD (WATTS)		20628.0									DEMAND LOAD	18565.2

RP26 Feeder Redesign

Demand Load	16056 W				
Voltage	208/120V				
Design Load	133.8 A	+25% Spare Capacity			167.3 A
	Circuit Breaker	Conductors	Neutral	Ground	Conduit
Old	200 A	(3) #3/0 CU THHN	(1) #3/0 CU THHN	(1) #6 CU	1 1/2"
New	200 A	(3) #2/0 CU THHN	(1) #2/0 CU THHN	(1) #6 CU	1"

LP4B												
VOLTAGE	480Y/277V, 3P, 4W				TAG				TYPE PANEL			
MOUNTING	Surface								C/B MIN	AIC	FEED	
SIZE/TYPER BUS					LOCATION				OPTIONS/ACCESSRS			
SIZE/TYPER MAINS									REMARKS			
LOAD DESCRIPTION	LOCATION	LOAD WATTS	C/B SIZE	POS NO	A PH	B PH	C PH	POS NO	C/B SIZE	LOAD WATTS	LOCATION	LOAD DESCRIPTION
Lighting	Basement	1596.0	20A/1P	1	*			2	20A/1P	940.0	Dorm Rooms	Lighting
Lighting	Basement	482.0	20A/1P	3	*			4	20A/1P	900.0	Dorm Rooms	Lighting
Lighting	Basement	1194.0	20A/1P	5	*		*	6	20A/1P	720.0	Dorm Rooms	Lighting
Lighting	Lounge	1420.0	20A/1P	7	*			8	20A/1P	816.0	Dorm Rooms	Lighting
Lighting	Lounge, Serving A	1781.0	20A/1P	9	*		*	10	20A/1P	988.0	Dorm Rooms	Lighting
Lighting	Serving Area	1668.0	20A/1P	11	*		*	12	20A/1P	0.0		Spare
Lighting	Serving Area	1765.0	20A/1P	13	*		*	14	20A/1P	0.0		Spare
Lighting	Conf Room	1312.0	20A/1P	15	*		*	16	20A/1P	0.0		Spare
Spare		0.0	20A/1P	17	*		*	18	20A/1P	0.0		Spare
Spare		0.0	20A/1P	19	*		*	20	20A/1P	0.0		Spare
Spare		0.0	20A/1P	21	*		*	22	20A/1P	0.0		Spare
Spare		0.0	20A/1P	23	*		*	24	20A/1P	0.0		Spare
Spare		0.0	20A/1P	25	*		*	26	20A/1P	0.0		Spare
Spare		0.0	20A/1P	27	*		*	28	20A/1P	0.0		Spare
Spare		0.0	20A/1P	29	*		*	30	20A/1P	0.0		Spare
Spare		0.0	20A/1P	31	*		*	32	20A/1P	0.0		Spare
Spare		0.0	20A/1P	33	*		*	34	20A/1P	0.0		Spare
Spare		0.0	20A/1P	35	*		*	36	20A/1P	0.0		Spare
Spare		0.0	20A/1P	37	*		*	38	20A/1P	0.0		Spare
Spare		0.0	20A/1P	39	*		*	40	20A/1P	0.0		Spare
Spare		0.0	20A/1P	41	*		*	42	20A/1P	0.0		Spare
SUB-TOTAL	A PHASE	6637.0		B PHASE				6463.0	C PHASE	3682.0		
TOTAL CONNECTED LOAD (WATTS)		15582.0									DEMAND LOAD	14023.8

LP4B Feeder Redesign

Demand Load	14023.8 W		
Voltage	480/277V		
Design Load	50.6 A	+25% Spare Capacity	63.3 A
	Circuit Breaker	Conductors	Neutral
Old	50 A	(3) #8 CU THHN	(1) #8 CU THHN
New	100 A	(3) #4 CU THHN	(1) #4 CU THHN
			Ground
			(1) #10 CU
			Conduit
			½"
			¾"

LP42													
VOLTAGE			TAG						TYPE PANEL				
MOUNTING			LOCATION						C/B MIN	AIC	FEED		
SIZE/TYPE BUS			LOCATION						OPTIONS/ACCESSRS				
SIZE/TYPE MAINS			REMARKS										
LOAD	LOCATION	LOAD	C/B	POS	A	B	C	POS	C/B	LOAD	LOCATION	LOAD	
DESCRIPTION		WATTS	SIZE	NO	PH	PH	PH	NO	SIZE	WATTS		DESCRIPTION	
Spare		0.0	20A 1P	1				2	20A 1P	553.0	Fourth Floor	Lighting	
Spare		0.0	20A 1P	3				4	20A 1P	0.0		Spare	
Lighting	Third Floor	290.0	20A 1P	5			*	6	20A 1P	328.0	Fifth Floor	Lighting	
Lighting	Third Floor	1075.0	20A 1P	7				8	20A 1P	0.0		Spare	
Lighting	Dorm Rooms	720.0	20A 1P	9			*	10	20A 1P	363.0	Sixth Floor	Lighting	
Lighting	Dorm Rooms	816.0	20A 1P	11			*	12	20A 1P	245.0	Multi-Purpose	Lighting	
Lighting	Dorm Rooms	988.0	20A 1P	13				14	20A 1P	450.0	Multi-Purpose	Lighting	
Lighting	Dorm Rooms	456.0	20A 1P	15			*	16	20A 1P	450.0	Multi-Purpose	Lighting	
Lighting	Dorm Rooms	524.0	20A 1P	17			*	18	20A 1P	1100.0	Multi-Purpose	Lighting	
Lighting	Dorm Rooms	712.0	20A 1P	19			*	20	20A 1P	105.0	Multi-Purpose	Lighting	
Lighting	Dorm Rooms	828.0	20A 1P	21			*	22	20A 1P	245.0	Multi-Purpose	Lighting	
Lighting	Dorm Rooms	724.0	20A 1P	23			*	24	20A 1P	0.0		Spare	
Spare		0.0	20A 1P	25			*	26	20A 1P	0.0		Spare	
Spare		0.0	20A 1P	27			*	28	20A 1P	0.0		Spare	
Spare		0.0	20A 1P	29			*	30	20A 1P	0.0		Spare	
Spare		0.0	20A 1P	31			*	32	20A 1P	0.0		Spare	
Spare		0.0	20A 1P	33			*	34	20A 1P	0.0		Spare	
Spare		0.0	20A 1P	35			*	36	20A 1P	0.0		Spare	
Spare		0.0	20A 1P	37			*	38	20A 1P	0.0		Spare	
Spare		0.0	20A 1P	39			*	40	20A 1P	0.0		Spare	
Spare		0.0	20A 1P	41			*	42	20A 1P	0.0		Spare	
SUB-TOTAL			A PHASE	3883.0	B PHASE						3062.0	C PHASE	4027.0
TOTAL CONNECTED LOAD (WATTS)				10972.0							DEMAND LOAD	9874.8	

LP42 Feeder Redesign

Demand Load	9874.8 W				
Voltage	480/277V				
Design Load	35.9 A	+25% Spare Capacity			44.6 A
	Circuit Breaker	Conductors	Neutral	Ground	Conduit
Old	30 A	(3) #12 CU THHN	(1) #12 CU THHN	(1) #10 CU	½"
New	60 A	(3) #8 CU THHN	(1) #8 CU THHN	(1) #10 CU	½"

SKM ANALYSIS

ARC FAULT STUDY

The arc fault analysis was performed on the panelboards with SKM software. The study calculated the bus bolted fault (kA), bus arcing fault (kA), protective device bolted fault (kA), protective device arcing fault (kA), arc flash boundary (in) and incident energy (cal/cm²). From this information, the software generated the Required Protective Clothing Category needed to work on each panel. The results of the study determined the panelboards in the Campus Center and Student Residence building require protective clothing categories 2 and 3. The output for each panelboard is listed in the following charts.

Bus Name	Protective Device	Bus (kV)	Bus Bolted (kA)	Bus Arcing (kA)	Prot Dev Bolted (kA)	Prot Dev Arcing (kA)	Trip/Delay (sec.)	Breaker Opening (sec.)	Ground
DB4B	MaxTripTime @2.0s	0.48	2.21	1.80	2.21	1.80	2	0.000	No
Generator	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	No
KC2	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	No
KCP	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	No
LS2B	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	No
LS42	MaxTripTime @2.0s	0.48	2.21	1.80	2.21	1.80	2	0.000	No
LS45	MaxTripTime @2.0s	0.48	2.21	1.80	2.21	1.80	2	0.000	No
LSDP4	MaxTripTime @2.0s	0.48	2.21	1.80	2.21	1.80	2	0.000	No
MP27A	MaxTripTime @2.0s	0.48	2.21	1.80	2.21	1.80	2	0.000	No
MS2	MaxTripTime @2.0s	0.208	5.04	2.69	5.04	2.69	2	0.000	No
MSB	MaxTripTime @2.0s	0.48	2.21	1.80	2.21	1.80	2	0.000	No
MSK	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	No
OS21	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	No
OS24	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	No
OS2BK	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	No

Bus Name	Protective Device	Bus kV	Bus Bolted (kA)	Bus Arcing (kA)	Prot Dev Bolted (kA)	Prot Dev Arcing (kA)	Trip/Delay (sec.)	Breaker Opening (sec.)	Ground
OSDP2B	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	No
OSDP4	MaxTripTime @2.0s	0.48	2.21	1.80	2.21	1.80	2	0.000	No
RP21	MaxTripTime @2.0s	0.208	5.04	2.69	5.04	2.69	2	0.000	No
RP22	MaxTripTime @2.0s	0.208	5.04	2.69	5.04	2.69	2	0.000	No
RP23	MaxTripTime @2.0s	0.208	5.04	2.69	5.04	2.69	2	0.000	No
RP24	MaxTripTime @2.0s	0.208	5.04	2.69	5.04	2.69	2	0.000	No
RP25	MaxTripTime @2.0s	0.208	5.04	2.69	5.04	2.69	2	0.000	No
RP26	MaxTripTime @2.0s	0.208	5.04	2.69	5.04	2.69	2	0.000	No
RP2B	MaxTripTime @2.0s	0.208	5.04	2.69	5.04	2.69	2	0.000	No
RP2BA	MaxTripTime @2.0s	0.208	5.04	2.69	5.04	2.69	2	0.000	No
RP2K	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	No
RP2P	MaxTripTime @2.0s	0.208	5.09	2.71	5.09	2.71	2	0.000	Yes

Bus Name	Equip Type	Gap (mm)	Arc Flash (in)	Working Distance (in)	Incident Energy (cal/cm2)	Required Protective FR Clothing Category	Label #
DB4B	PNL	25	48	18	6.0	Category 2 (*N2) (*N9)	# 0001
Generator	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0002
KC2	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0003
KCP	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0004
LS2B	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0005
LS42	PNL	25	48	18	6.0	Category 2 (*N2) (*N9)	# 0006
LS45	PNL	25	48	18	6.0	Category 2 (*N2) (*N9)	# 0007

Bus Name	Equip Type	Gap (mm)	Arc Flash (in)	Working Distance (in)	Incident Energy (cal/cm2)	Required Protective FR Clothing Category	Label #
LSDP4	PNL	25	48	18	6.0	Category 2 (*N2) (*N9)	# 0008
MP27A	PNL	25	48	18	6.0	Category 2 (*N2) (*N9)	# 0009
MS2	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0010
MSB	PNL	25	48	18	6.0	Category 2 (*N2) (*N9)	# 0011
MSK	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0012
OS21	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0013
OS24	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0014
OS2BK	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0015
OSDP2B	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0016
OSDP4	PNL	25	48	18	6.0	Category 2 (*N2) (*N9)	# 0017
RP21	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0018
RP22	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0019
RP23	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0020
RP24	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0021
RP25	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0022
RP26	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0023
RP2B	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0024
RP2BA	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0025
RP2K	PNL	25	68	18	11	Category 3 (*N2) (*N9)	# 0026
RP2P	PNL	25	58	18	8.2	Category 3 (*N2) (*N9)	# 0027

Category 2: Arc-rated FR shirts and pants.

Category 3: Arc-rated FR shirts and pants and arc flash suit.

SHORT CIRCUIT ANALYSIS

A short circuit analysis was conducted on the Campus Center and Student Residence electrical system using SKM software. The full results for the analysis can be found in Appendix E. The following table summarizes the results:

Bus Name	Voltage	3 Phase	X/R
DB4B	480	2432.7	11.4
Generator	208	5396.3	8.4
KC2	208	5390.5	8.3
KCP	208	5390.5	8.3
LS2B	208	5388.1	8.3
LS42	480	2335.3	8.3
LS45	480	2335.3	8.3
LSDP4	480	2376.0	9.4
MP27A	480	2459.8	12.8
MS2	208	5629.8	11.8
MSB	480	2461.3	12.9
MSK	208	5484.3	9.4
OS21	208	5396.3	8.4
OS24	208	5396.5	8.4
OS2BK	208	5396.3	8.4
OSDP2B	208	5490.3	9.5
OSDP4	480	2379.1	9.5
RP21	208	5532.7	10.1
RP22	208	5532.7	10.1
RP23	208	5532.7	10.1
RP24	208	5532.7	10.1
RP25	208	5532.7	10.1
RP26	208	5532.7	10.1
RP2B	208	5532.7	10.1
RP2BA	208	5532.7	10.1
RP2K	208	5390.5	8.3
RP2P	208	5577.0	10.8

PROTECTIVE DEVICE COORDINATION STUDY

The chart below is a protective device coordination study run through SKM software. It measures the main transformer, main switchboard, distribution panelboard LSDP4 and lighting panelboard LS42.

