| Appendix A |

LEED® 2009 New Construction and Major Renovation Scorecard

LEED 2009 for New Construction and Major Renovations

Project Checklist

Y	?	N			
7		19	**Sustainable Sites**	**Possible Points:**	**26**
Y			Prereq 1	Construction Activity Pollution Prevention	
		1	Credit 1	Site Selection	1
		5	Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
		6	Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
		2	Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
		1	Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
		1	Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1
8		2	**Water Efficiency**	**Possible Points:**	**10**
Y			Prereq 1	Water Use Reduction—20% Reduction	
4			Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
4			Credit 3	Water Use Reduction	2 to 4
11		7	**Energy and Atmosphere**	**Possible Points:**	**35**
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
4			Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
1			Credit 5	Measurement and Verification	3
2			Credit 6	Green Power	2
6	1	7	**Materials and Resources**	**Possible Points:**	**14**
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
		2	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	?	N			
2			Credit 4	Recycled Content	1 to 2
2			Credit 5	Regional Materials	1 to 2
		1	Credit 6	Rapidly Renewable Materials	1
	1		Credit 7	Certified Wood	1

10		5	**Indoor Environmental Quality**	**Possible Points:**	**15**
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
		1	Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
		1	Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
1			Credit 7.2	Thermal Comfort—Verification	1
		1	Credit 8.1	Daylight and Views—Daylight	1
		1	Credit 8.2	Daylight and Views—Views	1

6			**Innovation and Design Process**	**Possible Points:**	**6**
1			Credit 1.1	`	1
1			Credit 1.2	Innovation in Design: Use of Blended Cement	1
1			Credit 1.3	Innovation in Design: Develop an Educational Program	1
1			Credit 1.4	Innovation in Design: Use of Waterbottle Filling Stations	1
1			Credit 1.5	Innovation in Design: 95% Threshold for Construction Waste Management	1
1			Credit 2	LEED Accredited Professional	1

2		2	**Regional Priority Credits**	**Possible Points:**	**4**
1			Credit 1.1	Regional Priority: Stormwater Quantity Control	1
1			Credit 1.2	Regional Priority: 50% Construction Waste Management	1
		1	Credit 1.3	Regional Priority: Parking Capacity	1
		1	Credit 1.4	Regional Priority: Site Selection	1

50	1	42	**Total**	**Possible Points:**	**110**

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

| Appendix B |

Project Vasari Energy Analysis Results

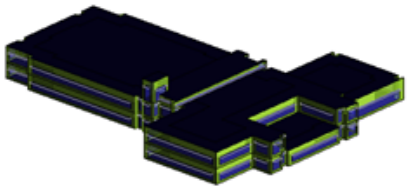
1. As Designed
2. With 25% Glazing
3. With Heat Pump

Revit Massing

As Designed Conceptual Energy Model

Analyzed at 3/10/2013 2:53:55 PM

Revit Energy Analysis Result



Building Performance Factors

Location:	40.5360145568848,-75.3772811889648
Weather Station:	59314
Outdoor Temperature:	Max: 90°F/Min: 5°F
Floor Area:	80,390 sf
Exterior Wall Area:	37,893 sf
Average Lighting Power:	1.20 W / ft²
People:	1,873 people
Exterior Window Ratio:	0.35
Electrical Cost:	$0.10 / kWh
Fuel Cost:	$1.02 / Therm

Energy Use Intensity

Electricity EUI:	11 kWh / sf / yr
Fuel EUI:	33 kBtu / sf / yr
Total EUI:	69 kBtu / sf / yr

Life Cycle Energy Use/Cost

Life Cycle Electricity Use:	25,759,569 kWh
Life Cycle Fuel Use:	794,592 Therms
Life Cycle Energy Cost:	$1,493,759

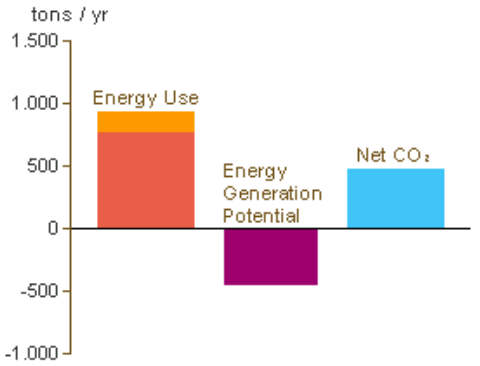
*30-year life and 6.1% discount rate for costs

Renewable Energy Potential

Roof Mounted PV System (Low efficiency):	165,026 kWh / yr
Roof Mounted PV System (Medium efficiency):	330,052 kWh / yr
Roof Mounted PV System (High efficiency):	495,077 kWh / yr
Single 15' Wind Turbine Potential:	3,316 kWh / yr

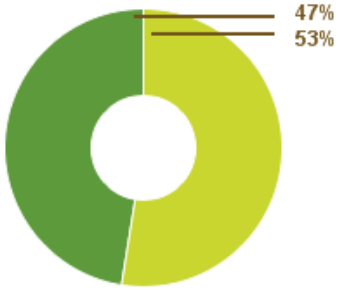
*PV efficiencies are assumed to be 5%, 10% and 15% for low, medium and high efficiency systems

Annual Carbon Emissions



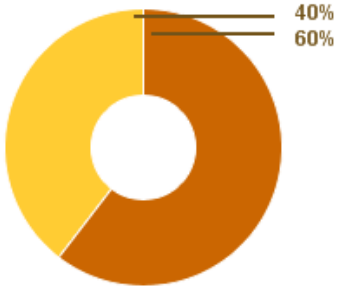
	(tons / yr)
Electricity Consumption	772
Fuel Consumption	153
Roof PV Potential (High Efficiency)	-445
Single 15' Wind Turbine Potential	-2
Net CO₂	478

Annual Energy Use/Cost



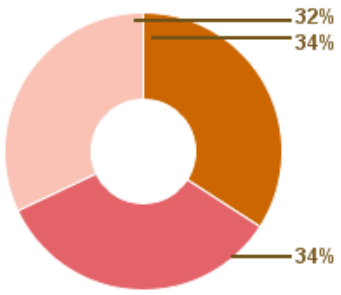
Electricity	53%	$82,774	858,652	kWh
Fuel	47%	$26,900	26,486	Therms
		$109,674		

Energy Use: Fuel



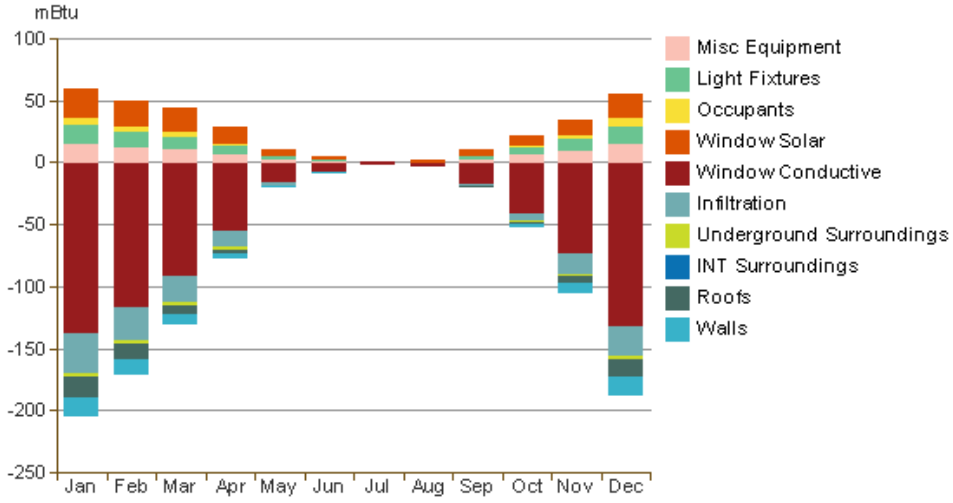
			(Therms)
HVAC	60%	$16,257	16,007
Domestic Hot Water	40%	$10,642	10,478
		$26,899	26,485

Energy Use: Electricity

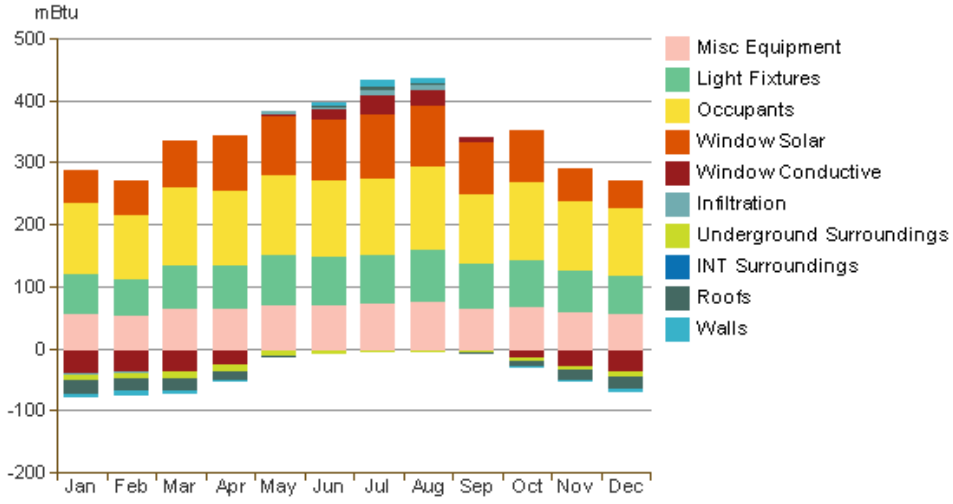


			(kWh)
HVAC	34%	$28,078	291,267
Lighting	34%	$27,855	288,962
Misc Equipment	32%	$26,369	273,546
		$82,302	853,775

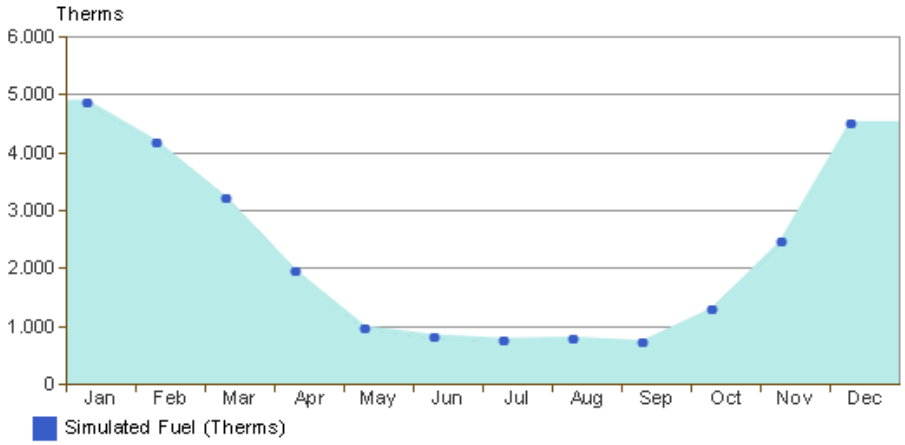
Monthly Heating Load



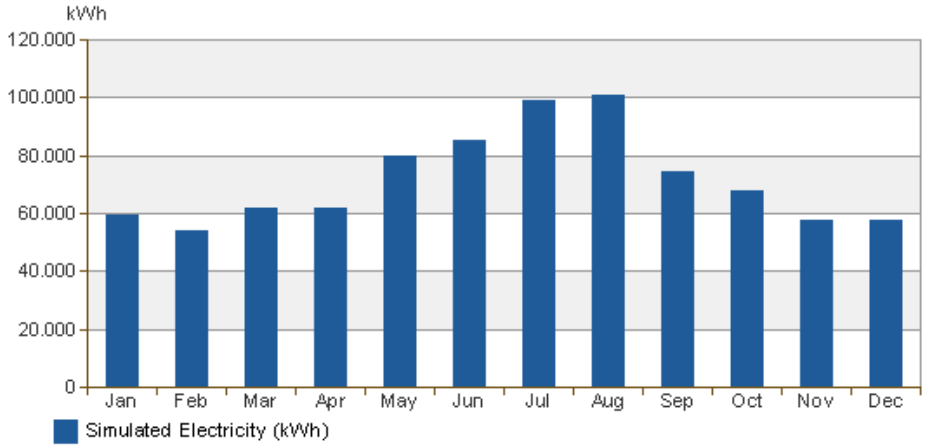
Monthly Cooling Load



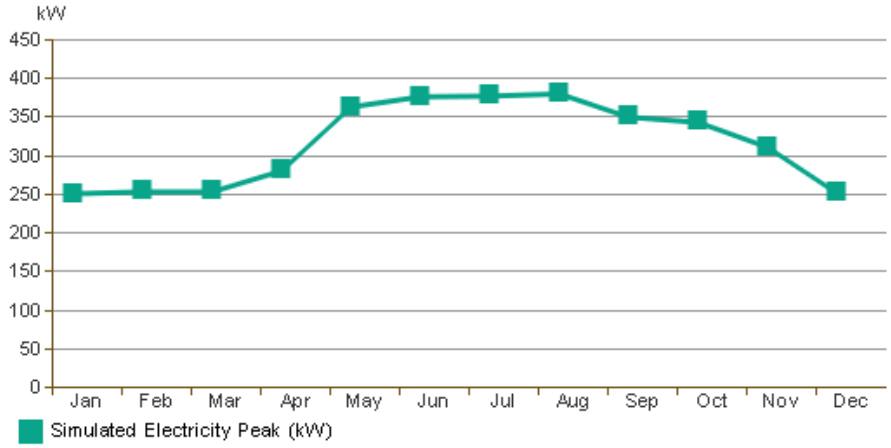
Monthly Fuel Consumption



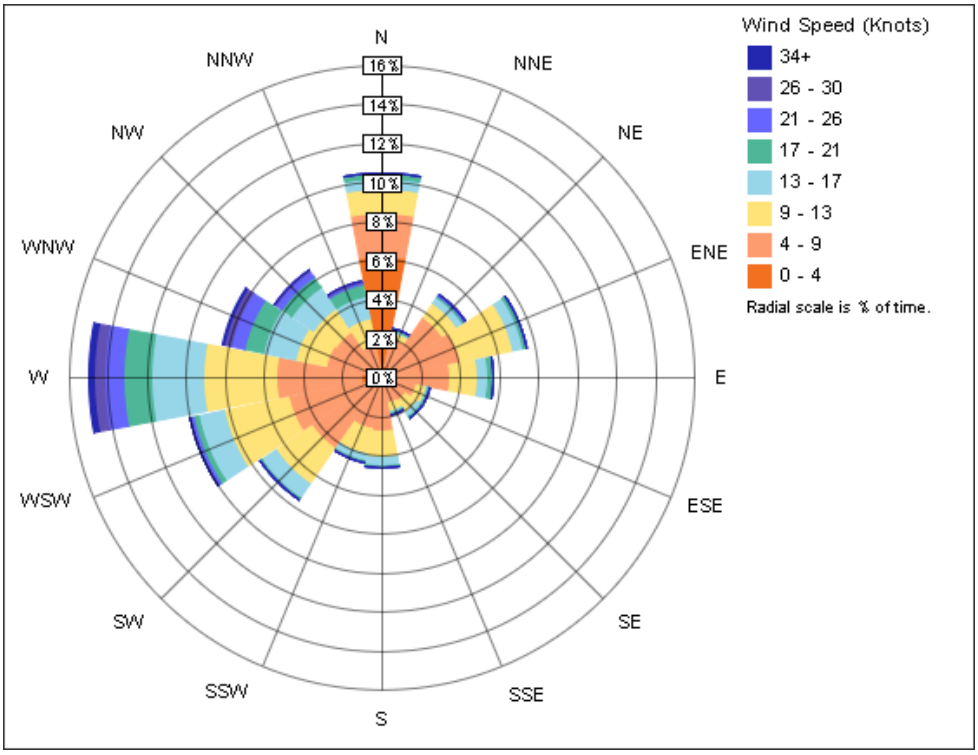
Monthly Electricity Consumption



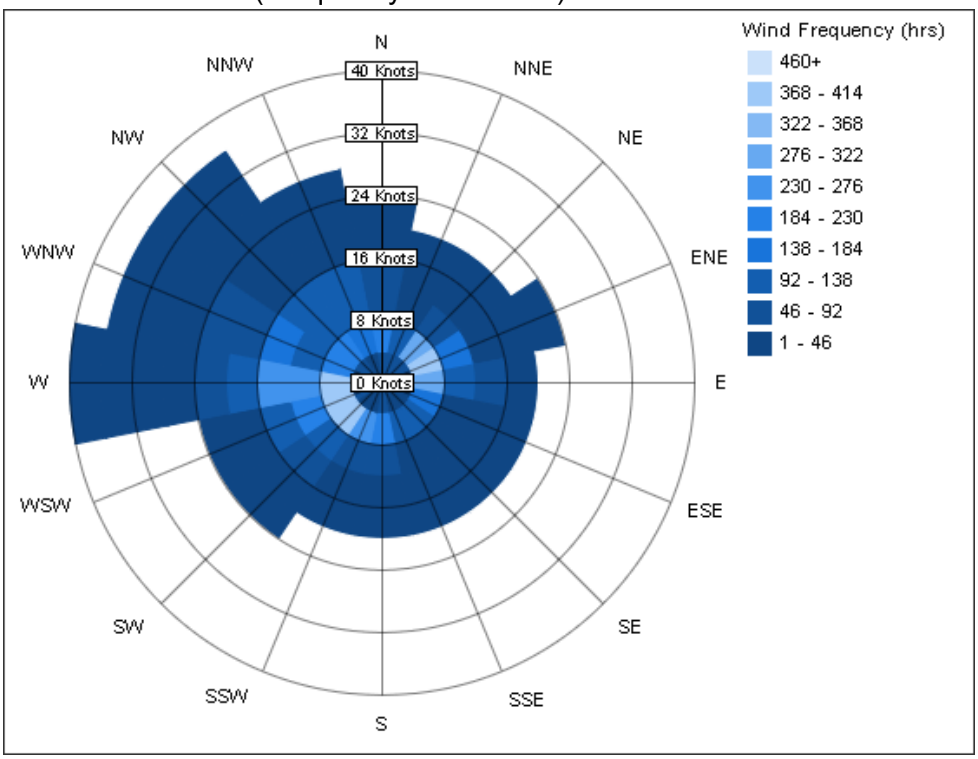
Monthly Peak Demand



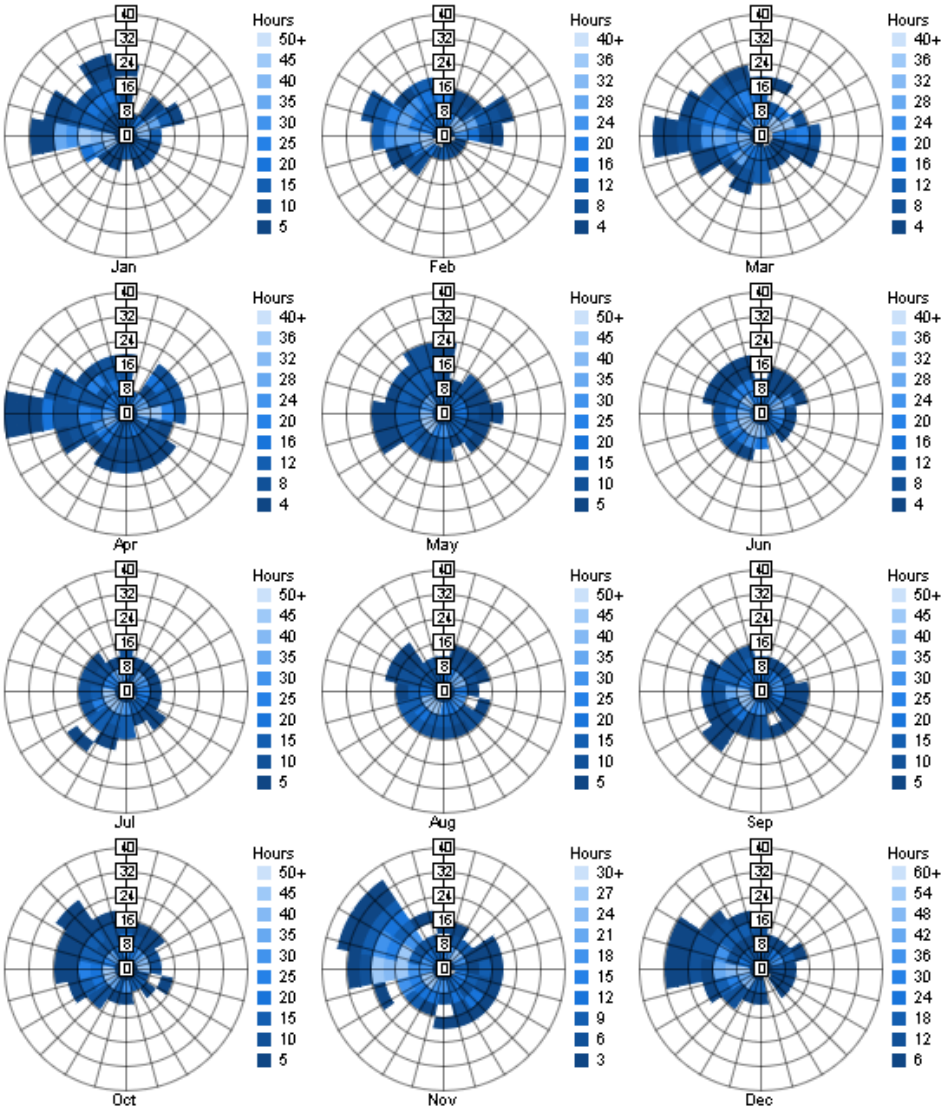
Annual Wind Rose (Speed Distribution)



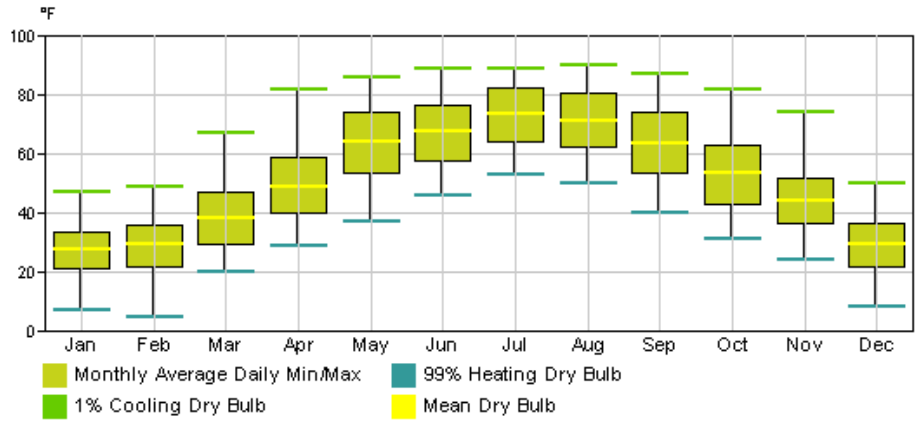
Annual Wind Rose (Frequency Distribution)



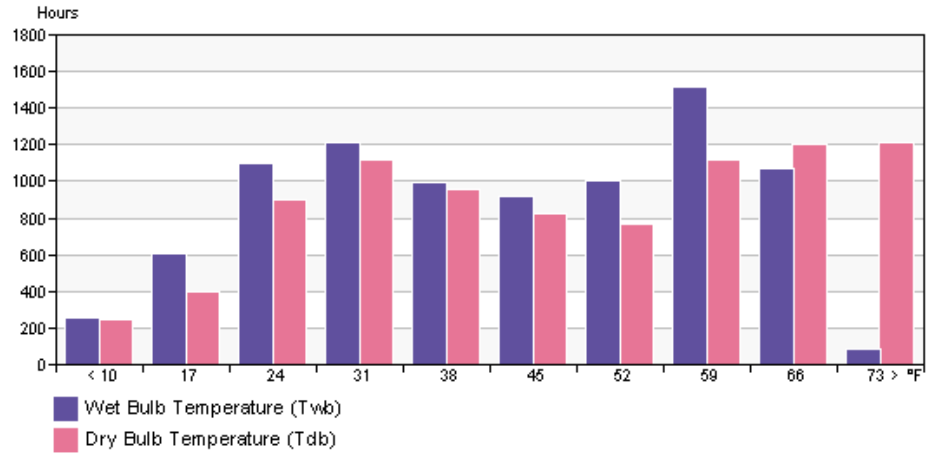
Monthly Wind Roses



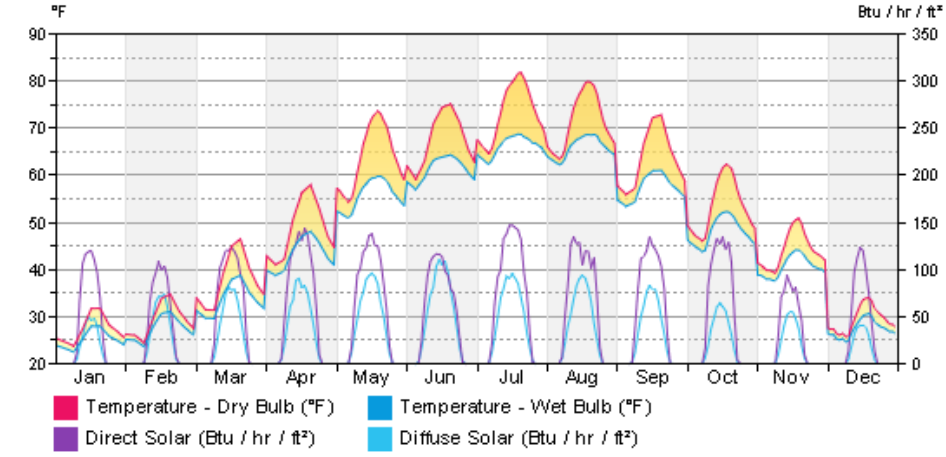
Monthly Design Data



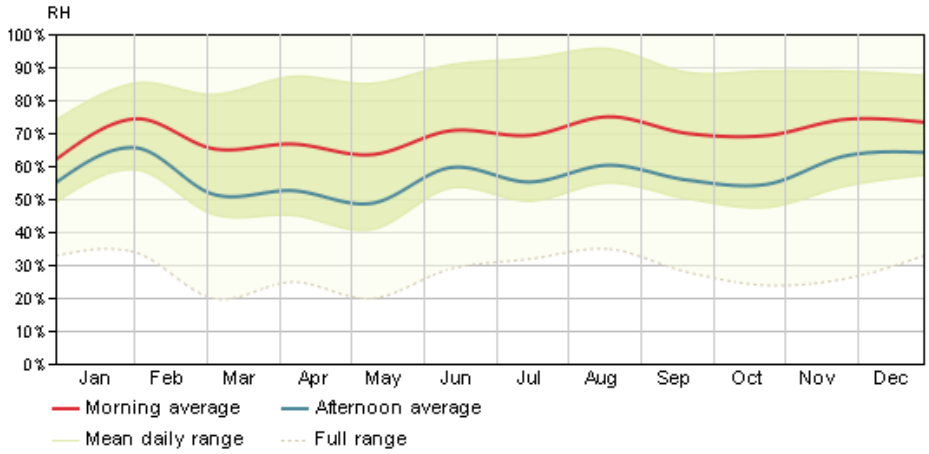
Annual Temperature Bins



Diurnal Weather Averages



Humidity



Revit Massing

25 Percent Glazing

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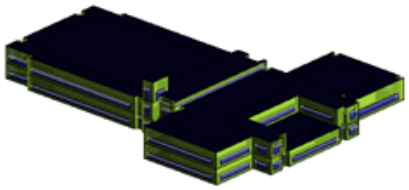
Revit Energy Analysis Result



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Floor Area:	80,390 sf
Exterior Wall Area:	37,893 sf
Average Lighting Power:	1.20 W / ft²
People:	1,873 people
Exterior Window Ratio:	0.21
Electrical Cost:	$0.10 / kWh
Fuel Cost:	$1.02 / Therm

Energy Use Intensity

Electricity EUI:	10 kWh / sf / yr
Fuel EUI:	27 kBtu / sf / yr
Total EUI:	62 kBtu / sf / yr

Life Cycle Energy Use/Cost

Life Cycle Electricity Use:	24,685,386 kWh
Life Cycle Fuel Use:	660,550 Therms
Life Cycle Energy Cost:	$1,384,942

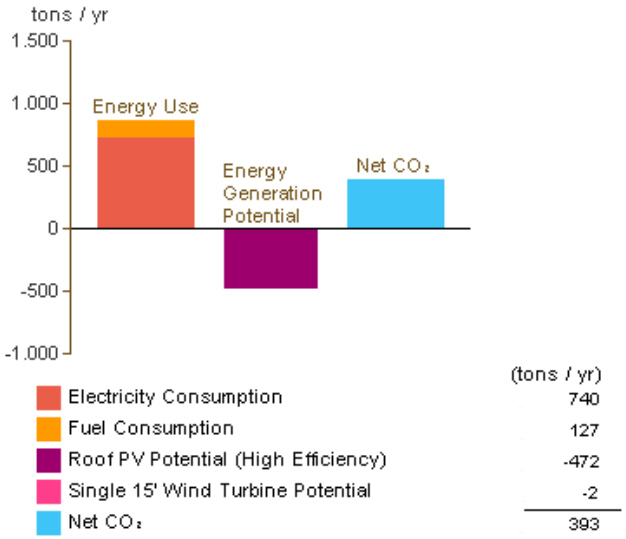
*30-year life and 6.1% discount rate for costs

Renewable Energy Potential

Roof Mounted PV System (Low efficiency):	175,202 kWh / yr
Roof Mounted PV System (Medium efficiency):	350,404 kWh / yr
Roof Mounted PV System (High efficiency):	525,606 kWh / yr
Single 15' Wind Turbine Potential:	3,316 kWh / yr

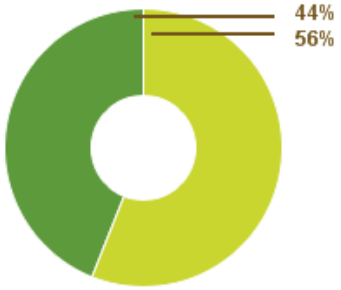
*PV efficiencies are assumed to be 5%, 10% and 15% for low, medium and high efficiency systems

Annual Carbon Emissions



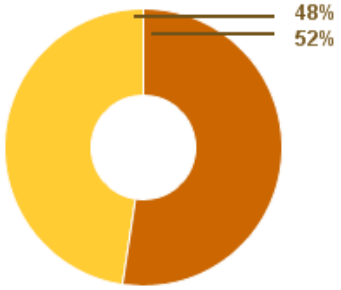
	(tons / yr)
Electricity Consumption	740
Fuel Consumption	127
Roof PV Potential (High Efficiency)	-472
Single 15' Wind Turbine Potential	-2
Net CO₂	393

Annual Energy Use/Cost



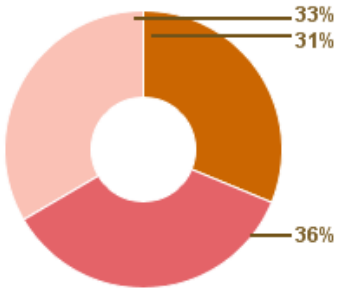
Electricity	56%	$79,322	822,846	kWh
Fuel	44%	$22,362	22,018	Therms
		$101,684		

Energy Use: Fuel



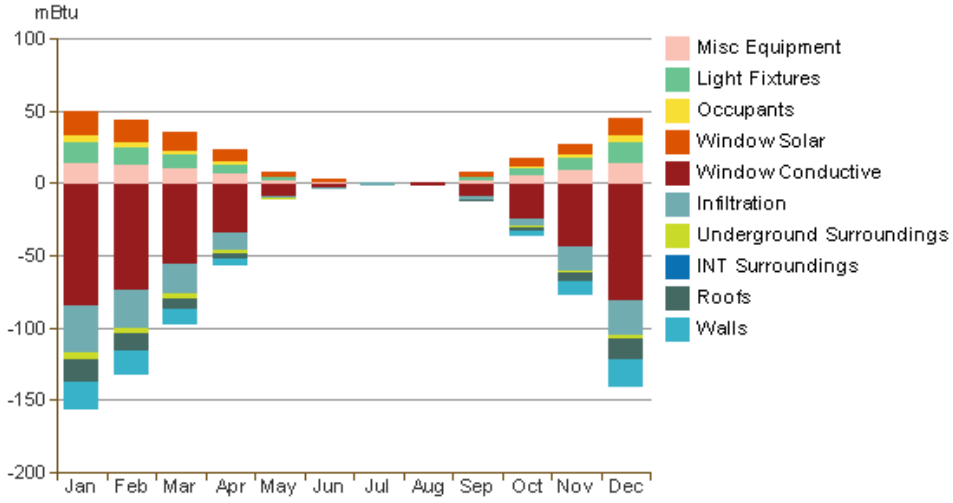
			(Therms)
HVAC	52%	$11,719	11,539
Domestic Hot Water	48%	$10,642	10,478
		$22,361	22,017

Energy Use: Electricity

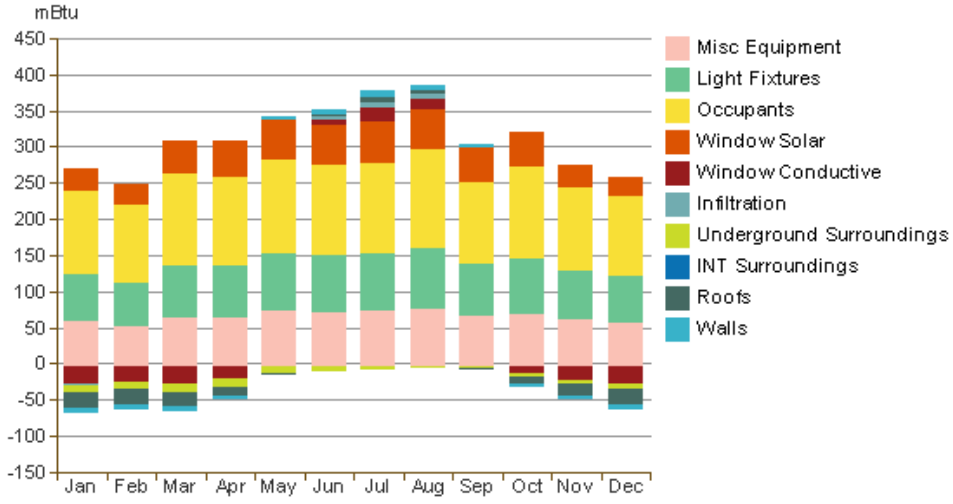


			(kWh)
HVAC	31%	$24,626	255,461
Lighting	36%	$27,855	288,962
Misc Equipment	33%	$26,369	273,546
		$78,850	817,969

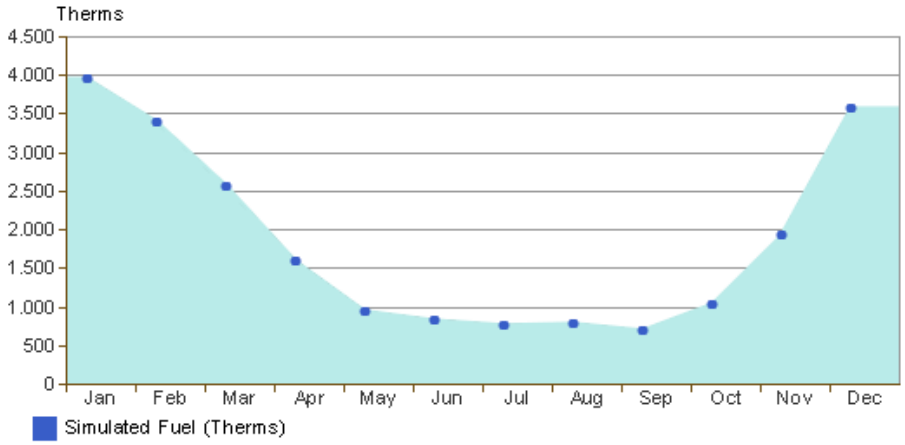
Monthly Heating Load



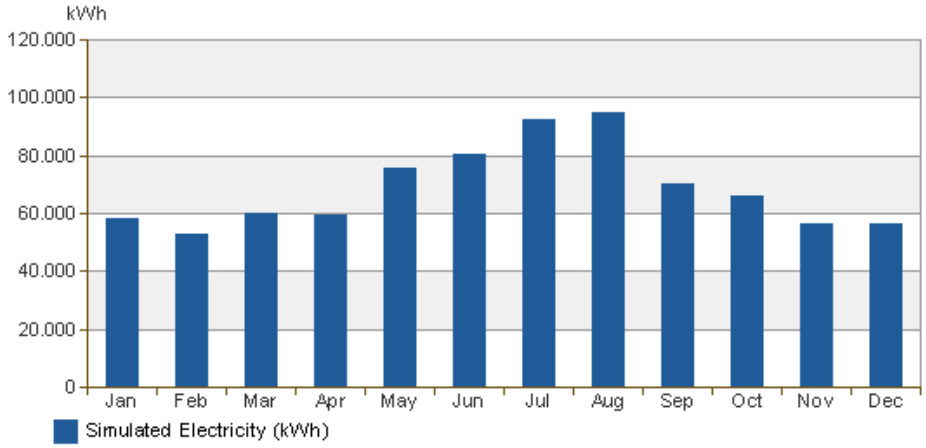
Monthly Cooling Load



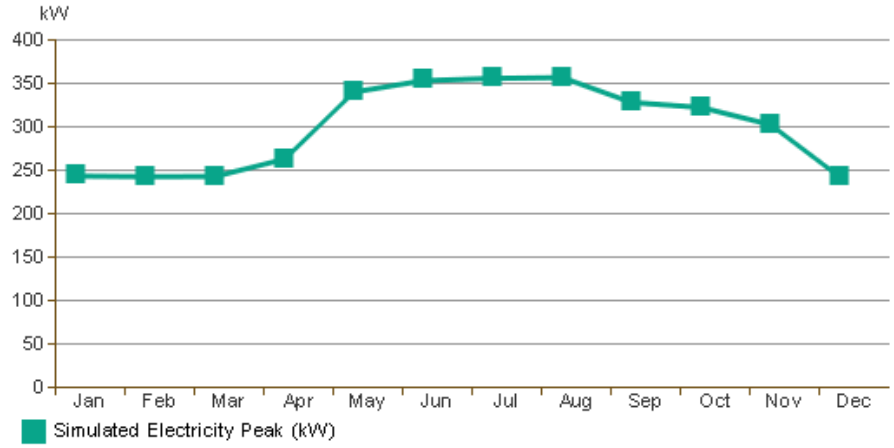
Monthly Fuel Consumption



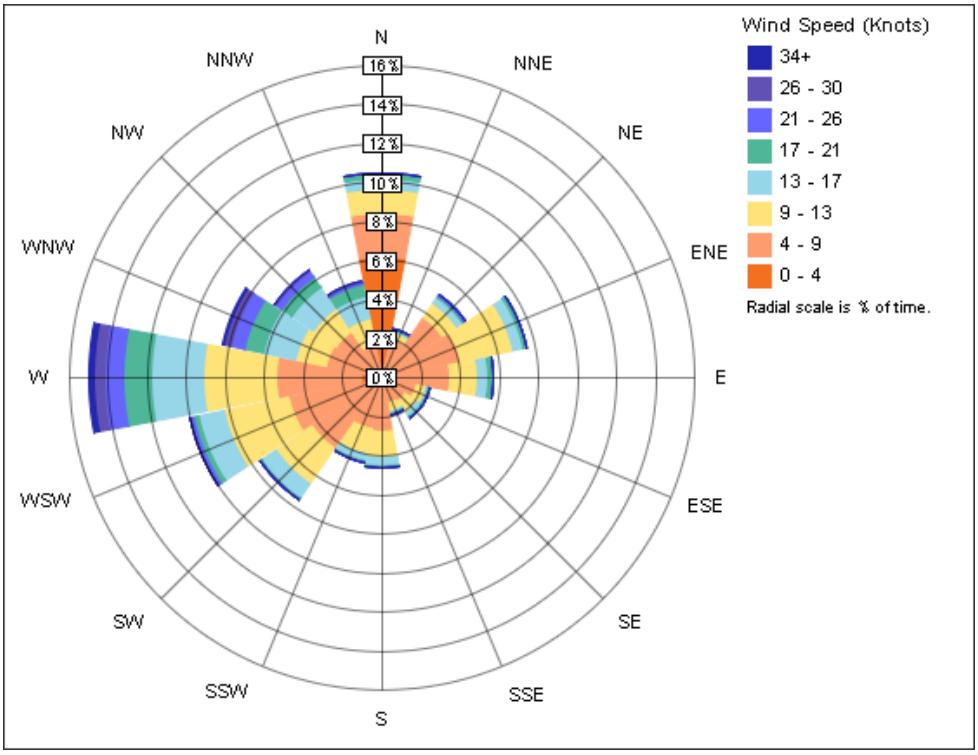
Monthly Electricity Consumption



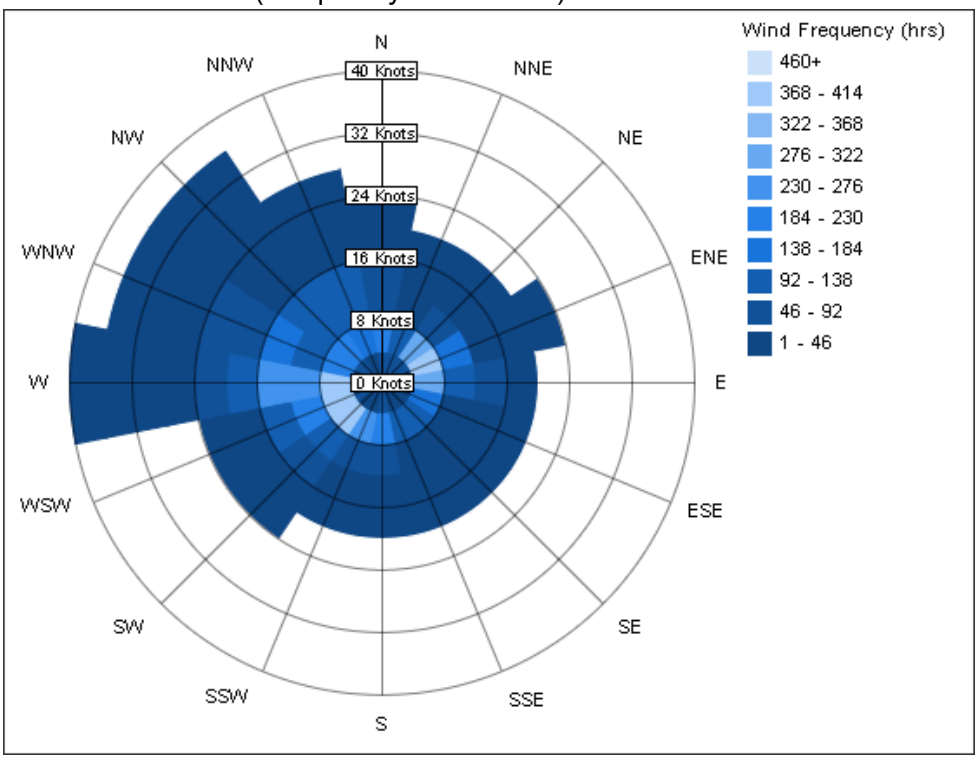
Monthly Peak Demand



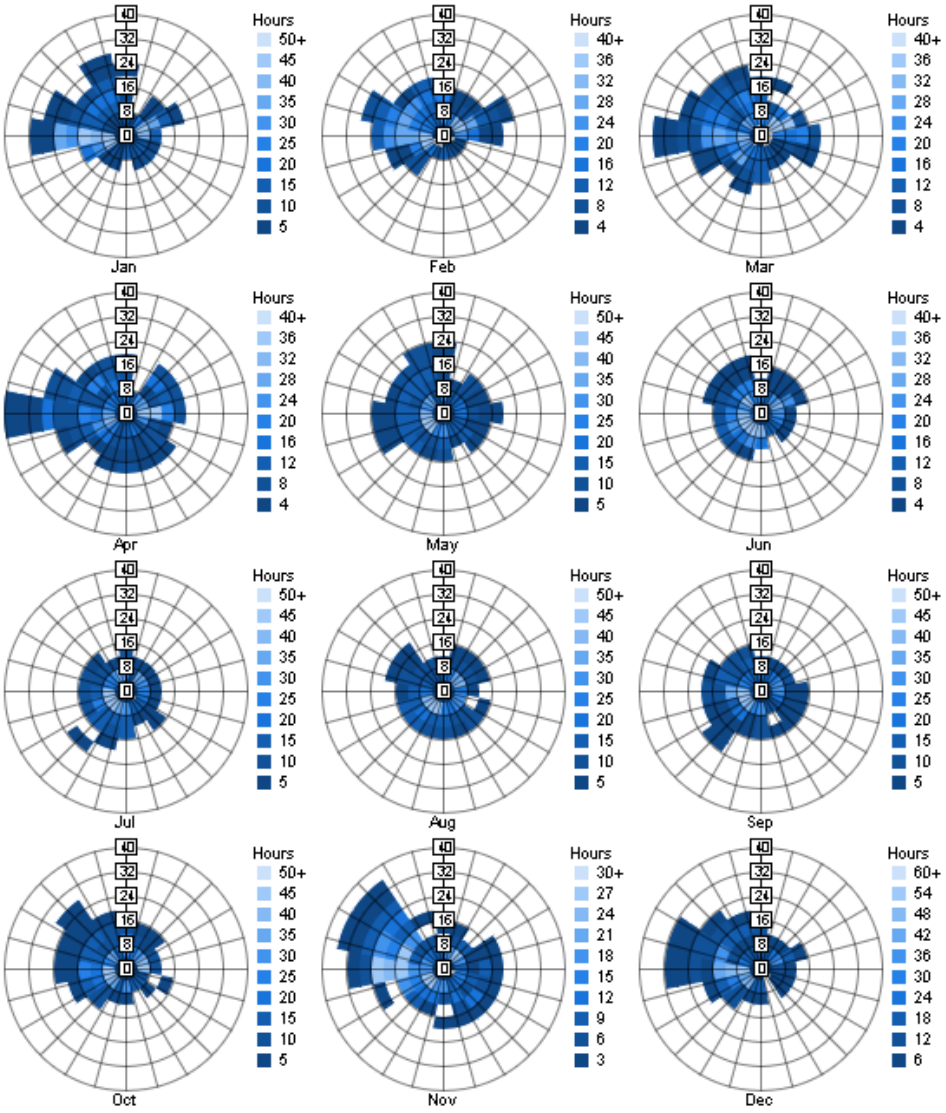
Annual Wind Rose (Speed Distribution)



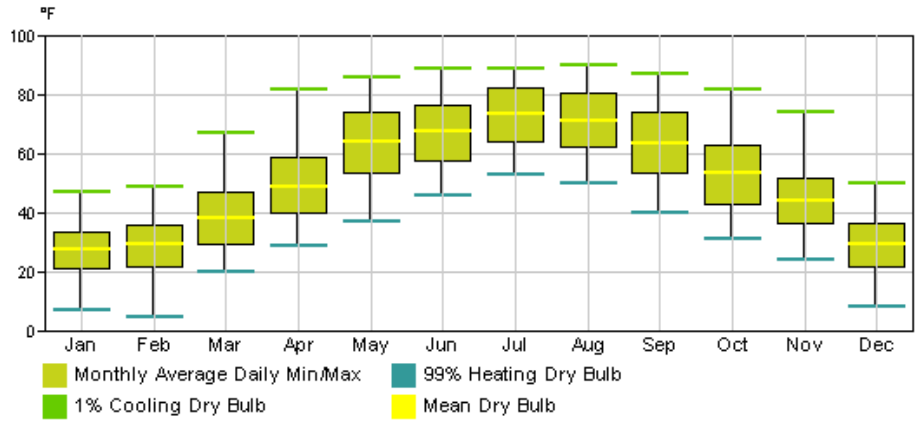
Annual Wind Rose (Frequency Distribution)



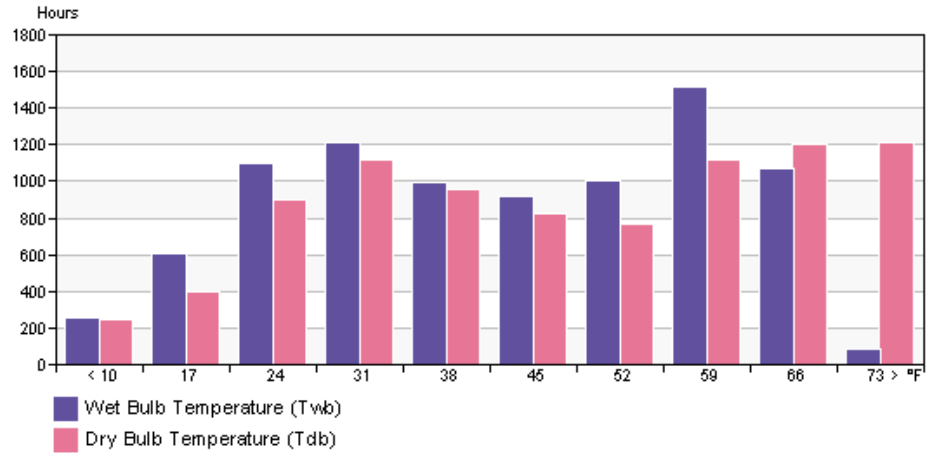
Monthly Wind Roses



Monthly Design Data



Annual Temperature Bins



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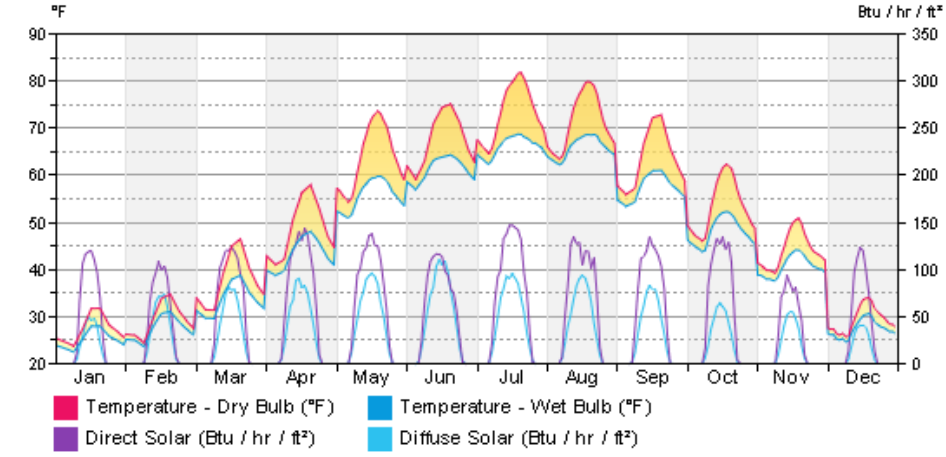
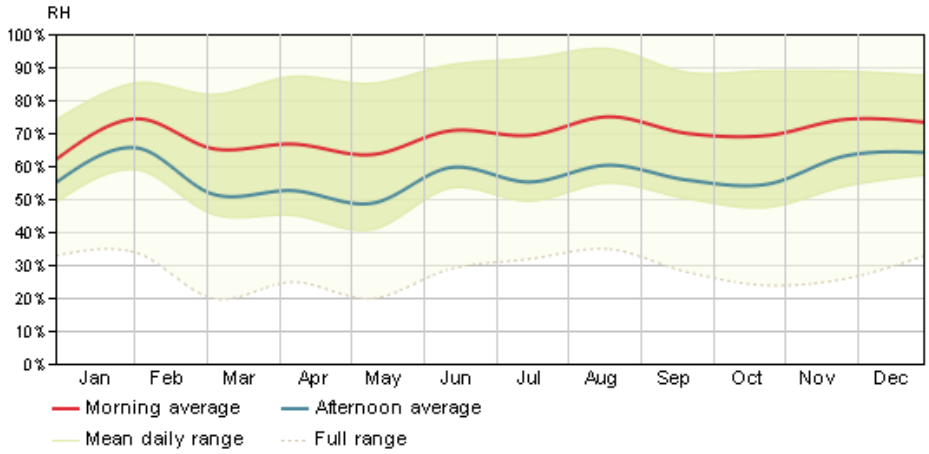


Humidity



Revit Massing

As Designed Conceptual Energy Model

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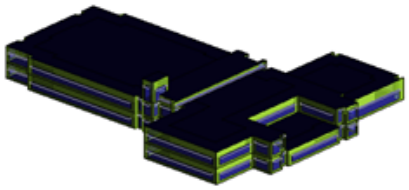
Revit Energy Analysis Result



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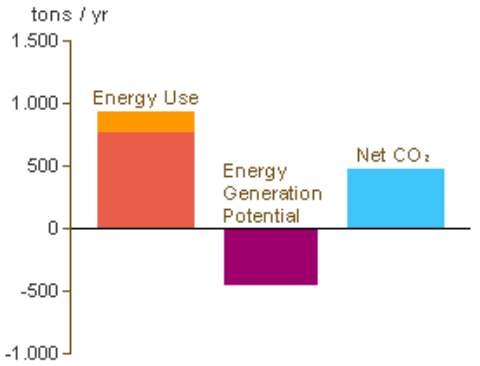
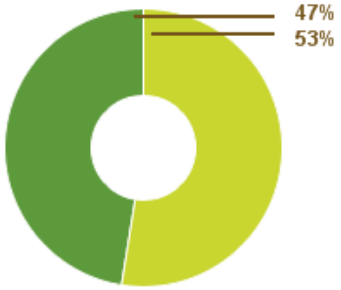


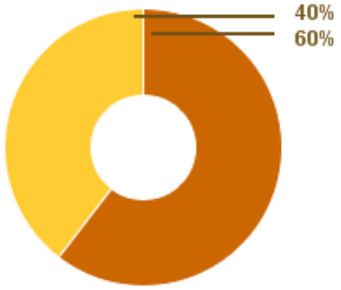
	(tons / yr)
Electricity Consumption	772
Fuel Consumption	153
Roof PV Potential (High Efficiency)	-445
Single 15' Wind Turbine Potential	-2
Net CO₂	478

Annual Energy Use/Cost



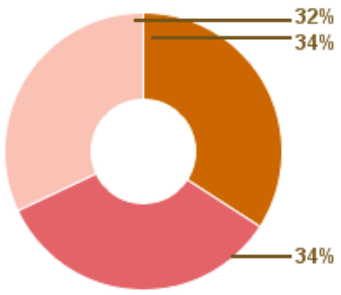
Electricity	53%	$82,774	858,652	kWh
Fuel	47%	$26,900	26,486	Therms
		$109,674		

Energy Use: Fuel



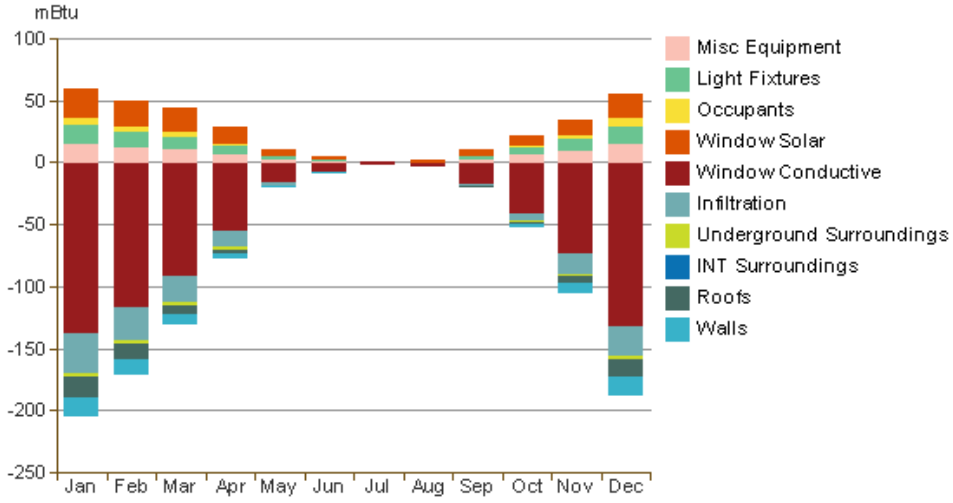
			(Therms)
HVAC	60%	$16,257	16,007
Domestic Hot Water	40%	$10,642	10,478
		$26,899	26,485

Energy Use: Electricity

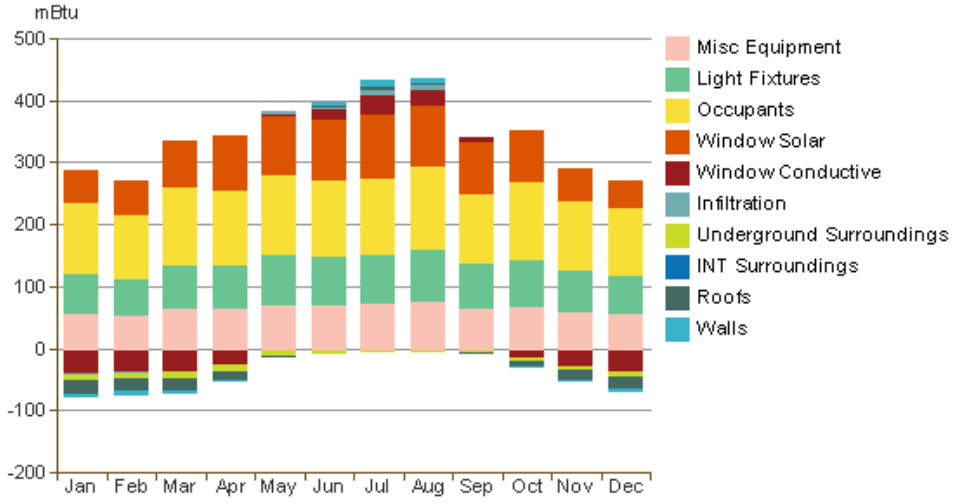


			(kWh)
HVAC	34%	$28,078	291,267
Lighting	34%	$27,855	288,962
Misc Equipment	32%	$26,369	273,546
		$82,302	853,775

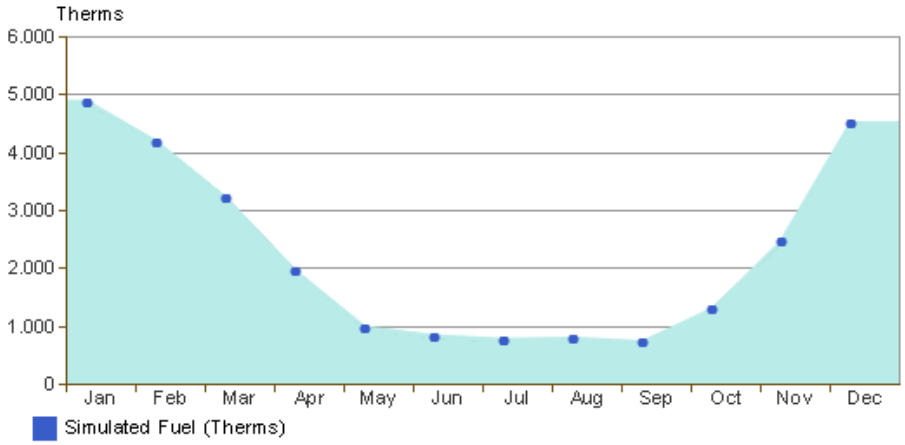
Monthly Heating Load



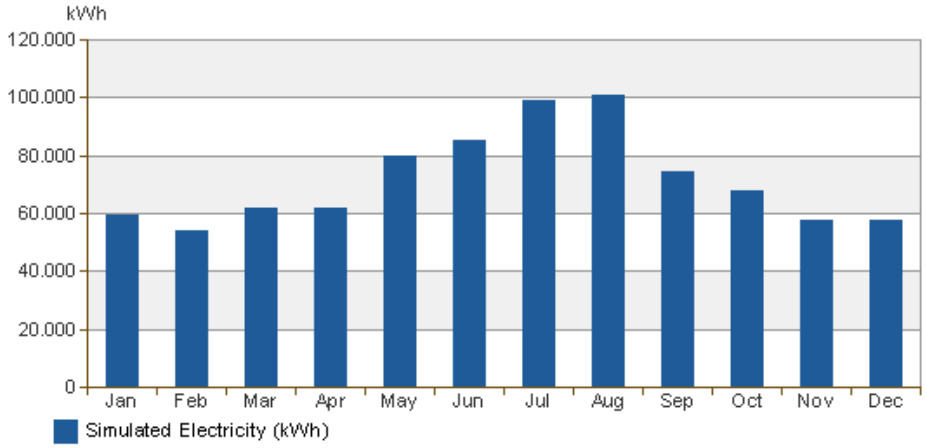
Monthly Cooling Load



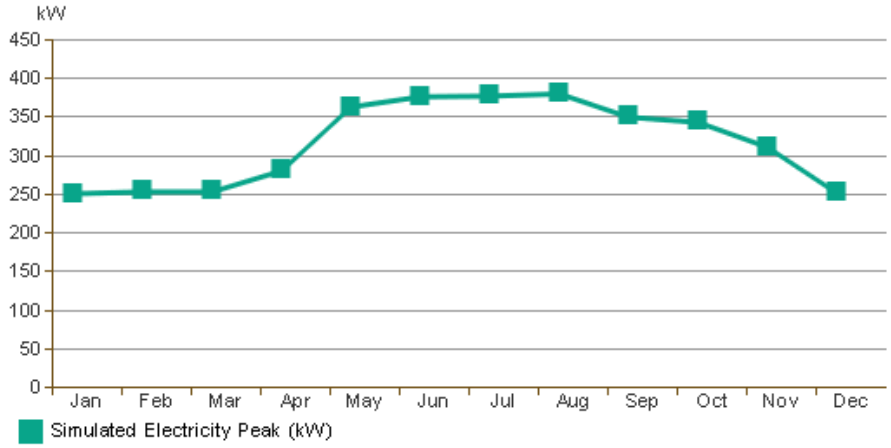
Monthly Fuel Consumption



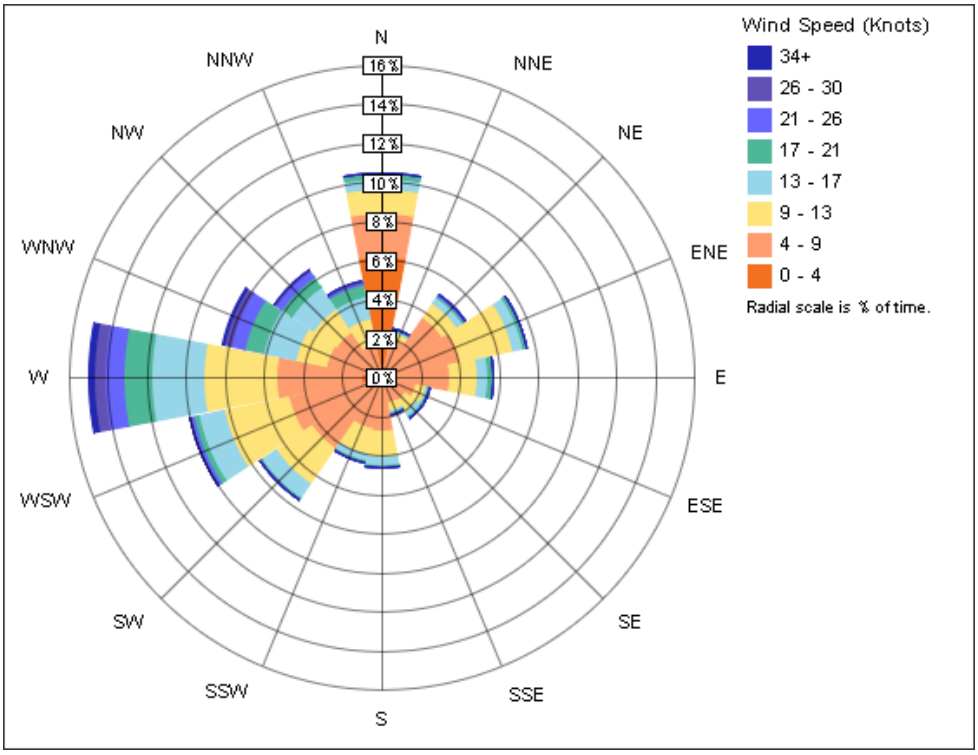
Monthly Electricity Consumption



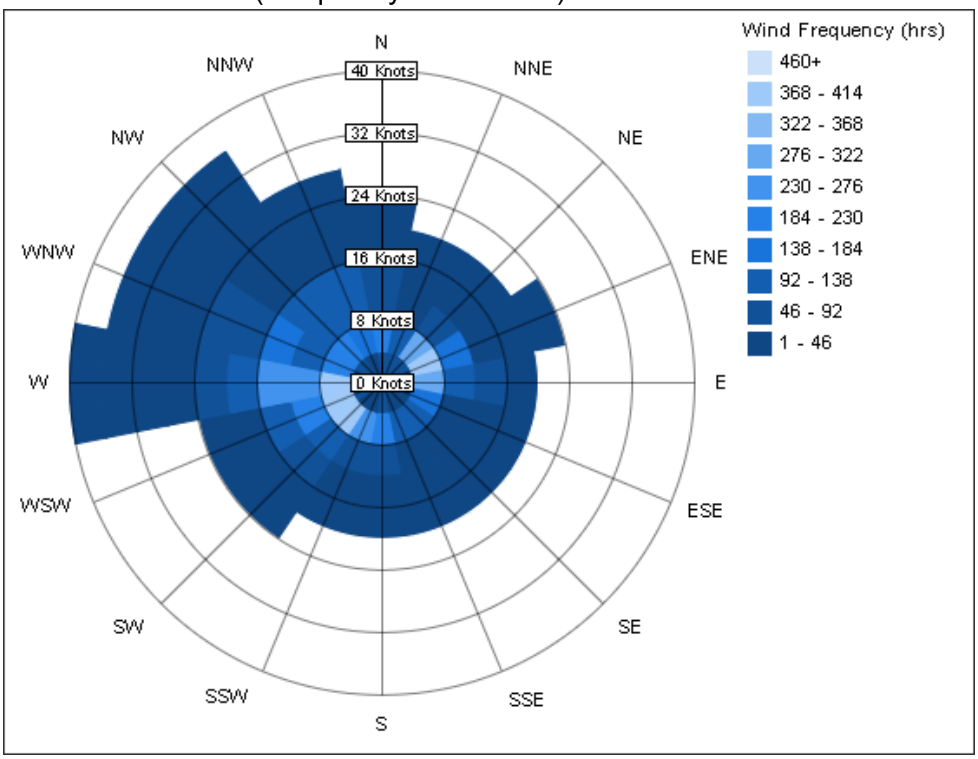
Monthly Peak Demand



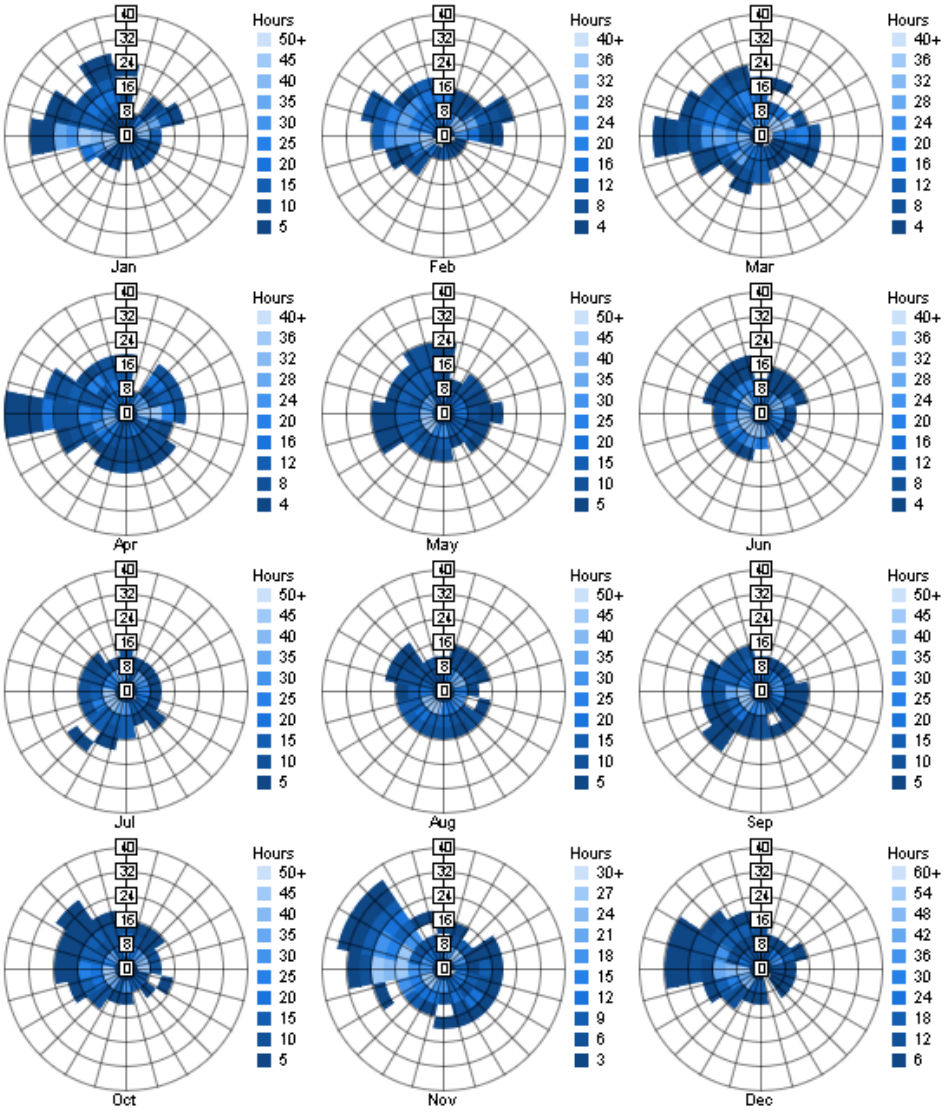
Annual Wind Rose (Speed Distribution)



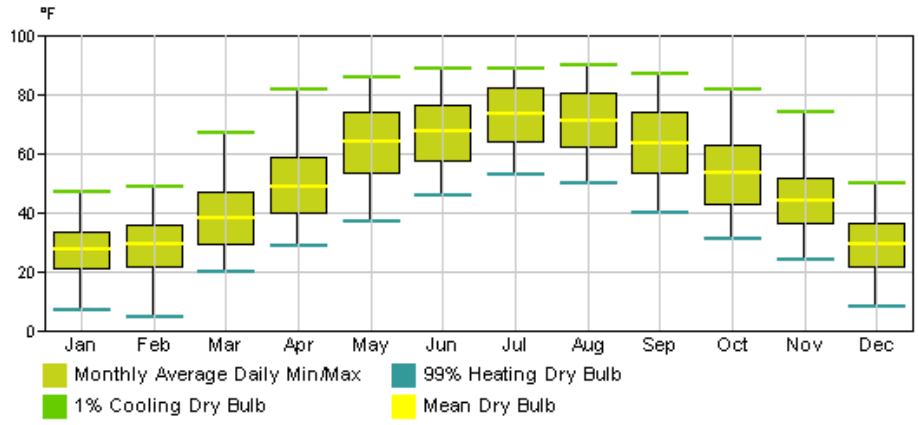
Annual Wind Rose (Frequency Distribution)



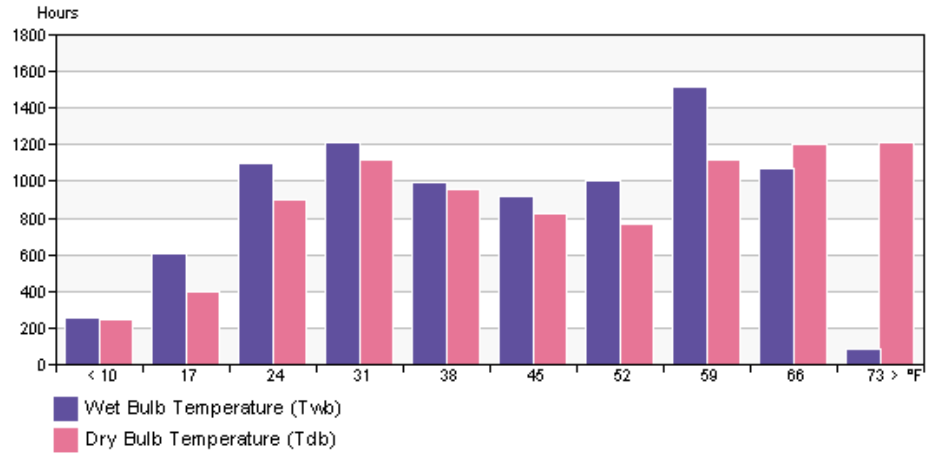
Monthly Wind Roses



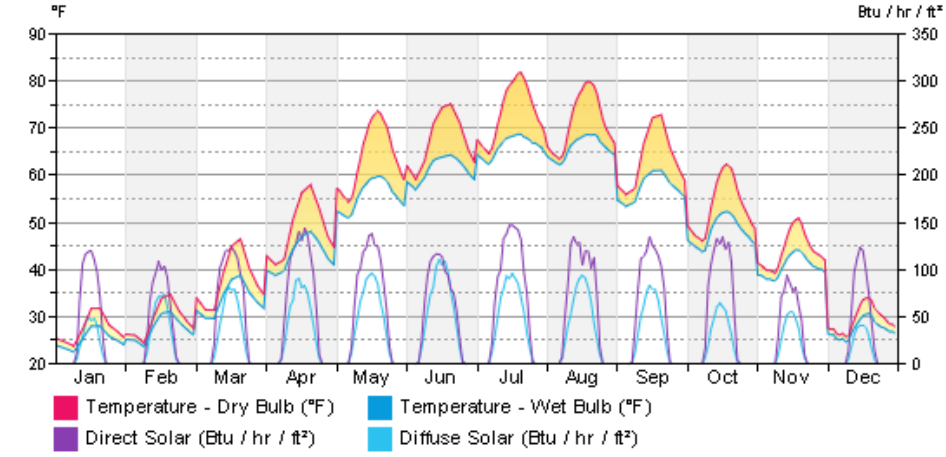
Monthly Design Data



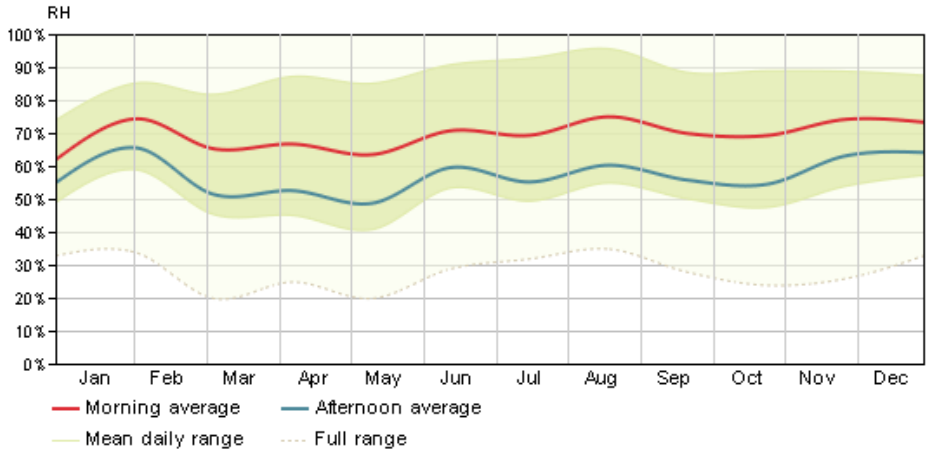
Annual Temperature Bins



Diurnal Weather Averages



Humidity



| Appendix C |

Green Roof Implementation Lifecycle Cost Table

Green Roof Implementation Lifecycle Cost Analysis

YEAR	INITIAL COST	ENERGY SAVINGS	EXTENDED LIFE	TAX SAVINGS	LIFECYCLE COST
0	$ (111,245.00)				$ (111,245.00)
1		147.68		8343.375	$ (102,753.95)
2		147.68		8343.375	$ (94,262.89)
3		147.68		8343.375	$ (85,771.84)
4		147.68		8343.375	$ (77,280.78)
5		147.68		8343.375	$ (68,789.73)
6		147.68		8343.375	$ (60,298.67)
7		147.68			$ (60,150.99)
8		147.68			$ (60,003.31)
9		147.68			$ (59,855.63)
10		147.68			$ (59,707.95)
11		147.68			$ (59,560.27)
12		147.68			$ (59,412.59)
13		147.68			$ (59,264.91)
14		147.68			$ (59,117.23)
15		147.68			$ (58,969.55)
16		147.68			$ (58,821.87)
17		147.68			$ (58,674.19)
18		147.68			$ (58,526.51)
19		147.68			$ (58,378.83)
20		147.68			$ (58,231.15)
21		147.68			$ (58,083.47)
22		147.68			$ (57,935.79)
23		147.68			$ (57,788.11)
24		147.68			$ (57,640.43)
25		147.68	$ 77,688.00		$ 20,195.25
26		147.68			$ 20,342.93
27		147.68			$ 20,490.61
28		147.68			$ 20,638.29
29		147.68			$ 20,785.97
30		147.68			$ 20,933.65
31		147.68			$ 21,081.33
32		147.68			$ 21,229.01
33		147.68			$ 21,376.69
34		147.68			$ 21,524.37
35		147.68			$ 21,672.05
36		147.68			$ 21,819.73
37		147.68			$ 21,967.41
38		147.68			$ 22,115.09
39		147.68			$ 22,262.77
40		147.68			**$ 22,410.45**

| Appendix D |

Photovoltaic System Product Specification Sheets

1. Astronenergy 250 Watt NOVA Solar Panel
2. Envision Solar Tree® Parking Lot PV Structure

NOVA™
Datasheet
Crystalline PV Module
CHSM6610M Series

250 | 255 | 260 | 265

EN

ELECTRICAL SPECIFICATIONS

STC rated output (P_{mpp})*	250 Wp	255 Wp	260 Wp	265 Wp
PTC rated output (P_{mpp})**	223.0 Wp	227.6 Wp	232.2 Wp	236.8 Wp
Standard sorted output	-0/+5 Wp			
Warranted power output STC ($P_{mpp\ min}$)	250 Wp	255 Wp	260 Wp	265 Wp
Rated voltage (V_{mpp}) at STC	30.48 V	30.84 V	31.19 V	31.49 V
Rated current (I_{mpp}) at STC	8.23 A	8.31 A	8.38 A	8.44 A
Open circuit voltage (V_{oc}) at STC	38.09 V	38.24 V	38.39 V	38.55 V
Short circuit current (I_{sc}) at STC	8.64 A	8.67 A	8.70 A	8.74 A
Module efficiency	15.2%	15.5%	15.8%	16.1%
Rated output (P_{mpp}) at NOCT	181.2 Wp	184.8 Wp	188.4 Wp	192.1 Wp
Rated voltage (V_{mpp}) at NOCT	27.15 V	27.43 V	27.73 V	28.06 V
Rated current (I_{mpp}) at NOCT	6.67 A	6.74 A	6.79 A	6.84 A
Open circuit voltage (V_{co}) at NOCT	34.66 V	34.80 V	34.94 V	35.08 V
Short circuit current (I_{cc}) at NOCT	7.13 A	7.15 A	7.18 A	7.21 A

Temperature coefficient (P_{mpp})	- 0.469%/K
Temperature coefficient (I_{sc})	+0.035%/K
Temperature coefficient (I_{mpp})	- 0.042%/K
Temperature coefficient (V_{mpp})	- 0.433%/K
Temperature coefficient (V_{oc})	- 0.328%/K
Normal operating cell temperature (NOCT)	47±2°C

Maximum system voltage SCII	1000 V_{DC}
Maximum system voltage NEC	600 V_{DC} / 1000 V_{DC}
Number of diodes	6
Maximum series fuse rating	15 A

* Measurement tolerance +/- 3%
** Estimated

A CHINT COMPANY

ASTRONERGY

QUALIFICATION AND WARRANTIES

Product standard	IEC 61215, 61730 / UL 1703
Extended product warranty	10 years
Output warranty of 90% performance P_{mpp} (STC)	10 years
Output warranty of 80% performance P_{mpp} (STC)	25 years
MunichRe Warranty	25 years

CELL TECHNOLOGY

Cell type	monocrystalline
Number of cells / cell arrangement	60 / 6 x 10
Cells dimension	6″

MECHANICAL SPECIFICATIONS

Outer dimensions (L x W x H)	1652 x 994 x 40 mm 65.04 x 39.13 x 1.57 in
Frame technology	Aluminum, silver anodized
Module composition	Glass / EVA / Backsheet (white)
Weight (module only)	19.5 kg / 42.9 lbs
Front glass thickness	3.2 mm / 0.13 in
Junction box IP rating	IP 65
Cable length / diameter (UL)	1000 mm / 39.37 in / 12 AWG
Cable length / diameter (IEC)	1000 mm / 39.37 in / 4 mm^2
Maximum load capacity	5400 Pa
Fire class	C
Connector type (UL)	Multi Contact type 4 / MC type 4 compatible
Connector type (TUV)	MC type 4 compatible

MISCELLANEOUS

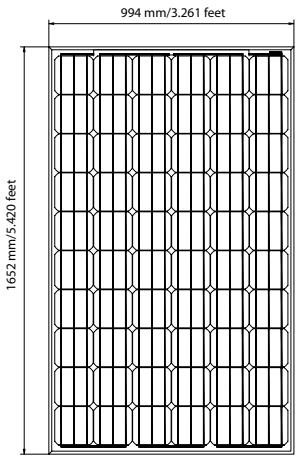
Packing unit	25 modules
Weight of packing unit	530 kg / 1166 lbs

ARTICLE NUMBER (per panel)-(NOVA) CHSM6610M Series

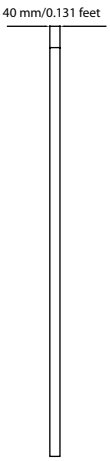
Model	Article No. (IEC)	Article No. (UL)
(NOVA) CHSM6610M-250	100287	100298
(NOVA) CHSM6610M-255	100288	100299
(NOVA) CHSM6610M-260	100289	100300
(NOVA) CHSM6610M-265	100290	100301

MODULE DIMENSION DETAILS

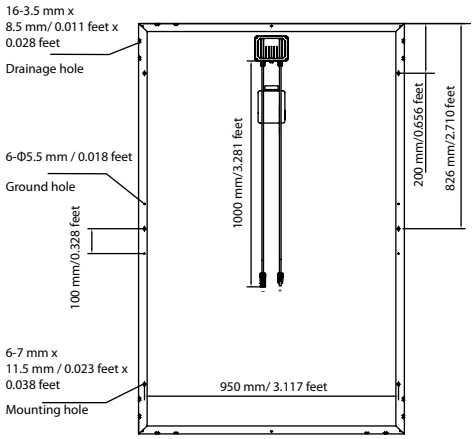
Front view



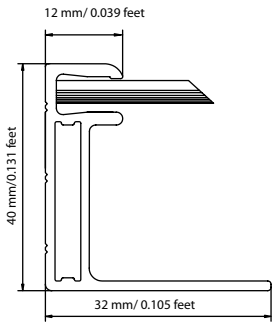
Side view



Rear view



Frame cross section



ENVISION SOLAR℠
SOLAR TREE® STRUCTURE

transforming parking lots and parking structures into clean power plants

Envision Solar Solar Grove® Array

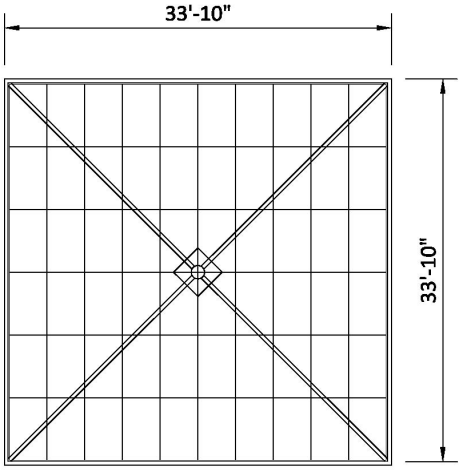
University of California, San Diego Gilman Parking Structure Solar Grove® Array.
(Inset from left to right) Centocor Solar Grove® Array, UCSD Hopkins Parking Structure Solar Grove® Array.
(Bottom right) EcoTech Institue Solar Tree® Array

Turn-key Photovoltaic Shade System
Delivered On-Site For Easy Installation

Solar Tree® arrays are the ideal solution to create distinguished, sustainable real estate. The Solar Tree® structure is designed to meet the needs of a wide variety of applications, shading vehicles from the sun, reducing carbon footprints through the production of renewable energy, and advancing the infrastructure for electric vehicles. Envision Solar's Solar Tree® arrays are the ideal combination of form, function and sustainability.

- Each Solar Tree® structure shades six standard parking spaces
- Each Solar Tree® structure generates enough energy to fully charge six electric vehicles each day, making them truly emissions-free.
- Iconic design suitable for a wide variety of properties
- System supports a variety of module types
- Easily deployed on existing structures or new construction
- Integrated Wire Management System
- Tilted at 15° to optimize aesthetics, energy production and shade, and to minimize maintenance
- Available for shipment worldwide

envision solar℠

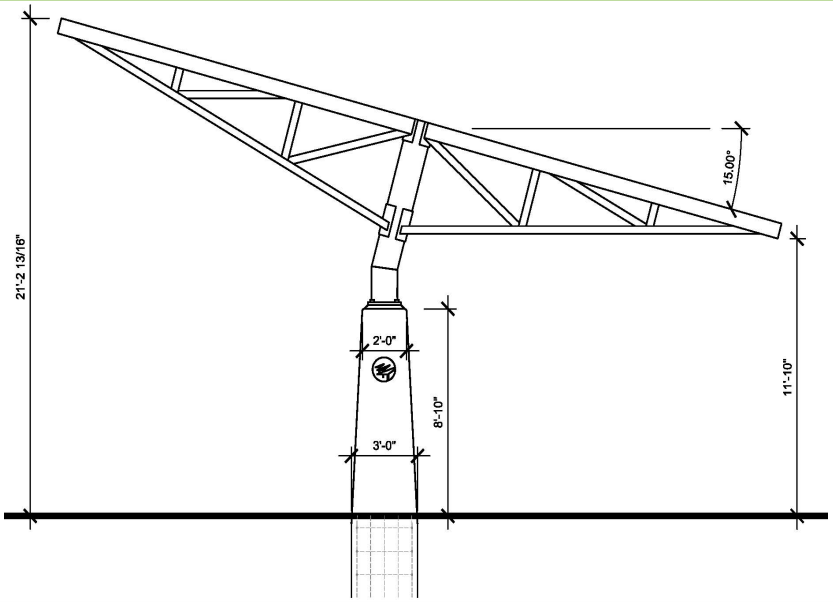


1 | PV SYSTEM

PV System Size Per Tree:
14.40 kW DC (STC)

Module Type and Model Number:
MAGE Powertech® Plus 240/6MF

Tilt Angle:
15°



2 | DIMENSIONS

Canopy:	33'-10" x 33'-10" (10.31m x 10.31m)
Base Plate Dimensions:	20" x 20" x 1-1/2" (50.8cm x 50.8cm x 3.81cm)
Concrete Column Dimensions:	Tapered height: 8'-10" (Standard; Can Vary) (2.69m) 24" at top; 36" at base (60.96cm); (91.44cm)
Typical Anchor Bolt Dimension:	1" dia. x (Depth Varies) (2.54cm)

3 | FOUNDATION (Below Grade)

Material: Reinforced concrete (caisson) foundation, structurally designed for each location. Depth of caisson varies per soil conditions.

NOTE: Structural foundation design is not included. Additional engineering services available in select locations upon request.

4 | ELECTRICAL SYSTEM INTEGRATION

Lighting: Optional lighting fixtures can be mounted to column or canopy, providing indirect ambient light or direct downlighting. Energy-efficient LED's are recommended.

Electric Vehicle Charging Station (Optional): Accommodates a variety of charging station configurations.

NOTE: All Solar Tree® structures are pre-fit with spare conduits for future devices such as communication, security, or flat-screen advertising panels.

5 | SHIPPING CHARACTERISTICS

Shipping Dimensions (L x W x H):
Purlins – 34' x 3' x 2' (10.36m x .91m x .61m)
Edge Beams – 35' x 2' x 1' (10.67m x .61m x .3m)
Column – 15' x 4' x 3' (4.57m x 1.22m x .91m)
Trusses – 24' x 3' x 4' (7.32m x .91m x 1.22m)
Modules – 6' x 6' x 3' (1.83m x 1.83m x .91m)

Weight:	6,500 lbs (2,948.35 kg)
Size of Container:	40' or 60' Truck
Packing Configuration:	Individually packaged, by component type
Pallet Quantity:	5 Pallets of Modules, 4 Additional Pallets

6 | ASSEMBLY INFORMATION

Equipment Requirements:
Light Crane, Forklift, Manlifts, Hand Tools
(Backhoe/Drill Rig if being installed on-grade)

Labor Requirements:
Envision Solar or other skilled supervision
3 Skilled Workers

Contractor License Requirements:
B, C (Varies by State)

Finishes:

Tapered Column:	Concrete
Steel Column:	ASTM-123 Hot-Dipped Galvanized Steel
Purlins:	G-90 Galvanized Steel
Trusses:	ASTM-123 Hot-Dipped Galvanized Steel

7 | CODE COMPLIANCE

Each Solar Tree® array exceeds code requirements in any jurisdiction in the United States with certain site specific modifications.

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T 866.746.0514 | F 858.799.4592 | E info@envisionsolar.com

envision solar℠

| Appendix E |

Photovoltaic System Lifecycle Cost Analysis Tables

1. Lifecycle Cost Analysis of Rooftop Array and 8 Solar Trees®
2. Lifecycle Cost Analysis of Rooftop Array Only
3. Lifecycle Cost Analysis of Rooftop Array and One Solar Tree®

LIFECYCLE COST ANALYSIS OF ROOFTOP ARRAY AND 8 SOLAR TREES

YEAR	INITIAL COST	INCENTIVES	POWER SAVINGS	SREC	LIFECYCLE COST
0	($1,226,150)				($1,226,150)
1		$367,845.00	$ 21,205.86	$ 39,840.44	($797,259)
2			$ 21,205.86	$ 39,840.44	($736,212)
3			$ 21,205.86	$ 39,840.44	($675,166)
4			$ 21,205.86	$ 39,840.44	($614,120)
5			$ 21,205.86	$ 39,840.44	($553,074)
6			$ 21,205.86	$ 39,840.44	($492,027)
7			$ 21,205.86	$ 39,840.44	($430,981)
8			$ 21,205.86	$ 39,840.44	($369,935)
9			$ 21,205.86	$ 39,840.44	($308,888)
10			$ 21,205.86	$ 39,840.44	($247,842)
11			$ 21,205.86		($226,636)
12			$ 21,205.86		($205,430)
13			$ 21,205.86		($184,224)
14			$ 21,205.86		($163,019)
15			$ 21,205.86		($141,813)
16			$ 21,205.86		($120,607)
17			$ 21,205.86		($99,401)
18			$ 21,205.86		($78,195)
19			$ 21,205.86		($56,989)
20			$ 21,205.86		($35,783)
21			$ 21,205.86		($14,578)
22			$ 21,205.86		$6,628
23			$ 21,205.86		$27,834
24			$ 21,205.86		$49,040
25			$ 21,205.86		**$70,246**

LIFECYCLE COST ANALYSIS OF ROOFTOP ARRAY ONLY

YEAR	INITIAL COST	INCENTIVES	POWER SAVINGS	SREC	LIFECYCLE COST
0	($369,850)				($369,850)
1		$110,955.00	$ 8,748.28	$ 16,403.04	($233,744)
2			$ 8,748.28	$ 16,403.04	($208,592)
3			$ 8,748.28	$ 16,403.04	($183,441)
4			$ 8,748.28	$ 16,403.04	($158,290)
5			$ 8,748.28	$ 16,403.04	($133,138)
6			$ 8,748.28	$ 16,403.04	($107,987)
7			$ 8,748.28	$ 16,403.04	($82,836)
8			$ 8,748.28	$ 16,403.04	($57,684)
9			$ 8,748.28	$ 16,403.04	($32,533)
10			$ 8,748.28	$ 16,403.04	($7,382)
11			$ 8,748.28		$1,366
12			$ 8,748.28		$10,115
13			$ 8,748.28		$18,863
14			$ 8,748.28		$27,611
15			$ 8,748.28		$36,360
16			$ 8,748.28		$45,108
17			$ 8,748.28		$53,856
18			$ 8,748.28		$62,604
19			$ 8,748.28		$71,353
20			$ 8,748.28		$80,101
21			$ 8,748.28		$88,849
22			$ 8,748.28		$97,598
23			$ 8,748.28		$106,346
24			$ 8,748.28		$115,094
25			$ 8,748.28		**$123,842**

LIFECYCLE COST ANALYSIS OF ROOFTOP ARRAY AND ONE SOLAR TREE

YEAR	INITIAL COST	INCENTIVES	POWER SAVINGS	SREC	LIFECYCLE COST
0	($494,606)				($494,606)
1		$148,381.80	$ 10,314.36	$ 19,339.38	($316,570)
2			$ 10,314.36	$ 19,339.38	($286,917)
3			$ 10,314.36	$ 19,339.38	($257,263)
4			$ 10,314.36	$ 19,339.38	($227,609)
5			$ 10,314.36	$ 19,339.38	($197,956)
6			$ 10,314.36	$ 19,339.38	($168,302)
7			$ 10,314.36	$ 19,339.38	($138,648)
8			$ 10,314.36	$ 19,339.38	($108,994)
9			$ 10,314.36	$ 19,339.38	($79,341)
10			$ 10,314.36	$ 19,339.38	($49,687)
11			$ 10,314.36		($39,372)
12			$ 10,314.36		($29,058)
13			$ 10,314.36		($18,744)
14			$ 10,314.36		($8,429)
15			$ 10,314.36		$1,885
16			$ 10,314.36		$12,199
17			$ 10,314.36		$22,514
18			$ 10,314.36		$32,828
19			$ 10,314.36		$43,142
20			$ 10,314.36		$53,457
21			$ 10,314.36		$63,771
22			$ 10,314.36		$74,086
23			$ 10,314.36		$84,400
24			$ 10,314.36		$94,714
25			$ 10,314.36		$105,029

| Appendix F |

Lutron Quantum® Submittal Package

1. Bill of Material
2. One-Line Drawings
3. EcoSystem® Loop Layouts

Job No: 186917 **Date:** 17-Apr-2012

Job Name: DeSales University - Gambet Center - Exterior Lighting Optic **Project ID:** **186917.2.9**

Job Location: Upper Sauccon, PA

Quantity	Product
	<<QUANTUM>>
1	QS-A-CMP-LBO-0
	Quantum Client Laptop by Others. The customer will be supplying a client laptop PC to operate the Quantum Q-Admin software. Refer to the product data sheet with the same model number for minimum requirements.
1	QS-LO
	Quantum Local Area Network Lutron Only. The Quantum Inter-processor and computer (server / desktop or laptop) network is a dedicated LAN for the Lutron system. The Quantum computer may or may not be supplied by Lutron and all nodes on the LAN are limited to Lutron Quantum processor and Lutron Quantum Computers. All network equipment including routers, switches, and network cables are supplied by others to Lutron specifications.
2	QP3-1PL-100-240
	Pre-assembled Quantum processor panel containing one Quantum processor with two configurable links. Each Quantum processor link can be configured to be a QS link or Power panel link. Panel accepts one 120V, 1 phase, 2 wire, 20A feed, (20A-1P over-current protection, per circuit, by others.) Dimensions (inches(cm)): 13.25 (33.7)H x 9.25 (23.5)W x 3.16 (8.0)D. Weight (w/o packaging): 11 lbs.
2	QSW-L-PP-A
	Quantum software light control and monitor, per processor, English
2	QSW-BAC-L-PP-A
	Quantum software BACnet lights, per processor
2	QSW-GGL-PP-A
	Quantum Software - GreenGlance - 1 license required per processor (NOTE: REQUIRES REPORTING SOFTWARE LICENSE - QSW-RPT-PP-A)
2	QSW-RPT-PP-A
	Quantum Software - Reporting - 1 license required per processor
1	QSN-2ECO-S For Both Levels
	EcoSystem Energi Savr Node with 2 EcoSystem links. Control up to 128 EcoSystem-cmopatible ballasts or drivers. Wired inputs for 4 daylight sensors, 4 occupancy/vacancy sensors, 4 EcoSystem wallstations or IR receivers. QS link. Requires Energi Savr Node application on Apple iPod touch or iPhone to program. UL/CSA. 9.25 in. W (234.95 mm) x 13.25 in. H (336.55 mm) x 3.16 in. L (80.26 mm)
	<<1ST FLOOR>>
64	LOS-CDT-2000-WH
	Occupancy sensor - Ceiling mount, dual technology, 2000 sq ft, active high, 20-24VDC, white. Not rated for outdoor use. Contact Engineering.
36	QSWS2-2BI-WH
	QS device: seeTouch QS 2-button wallstation. Two contact closure inputs via a connector on the back of the wallstation. Dimensions: 116 mm x 70 mm x 76 mm.
2	CW-2-WH
	CLARO 2 Gang Faceplate White
6	QSWS2-2BRLI-WH
	QS device: seeTouch QS 2-button wallstation with raise/lower. Two contact closure inputs via a connector on the back of the wallstation. Dimensions: 116 mm x 70 mm x 76 mm.
19	QSM2-4W-C
	434 MHZ QS Sensor Module with 4 wired connections, Ceiling Mount

Job No: 186917 **Date:** 17-Apr-2012

Job Name: DeSales University - Gambet Center - Exterior Lighting Optic **Project ID:** **186917.2.9**

Job Location: Upper Sauccon, PA

16	QSN-4S16-S	Normal
	4 zone (feedthrough) switching module. Includes QS communication link and 4 groups of inputs for sensors and wallstations. Dimensions: 13.25"x 9.25"x 3.16"	
3	QSN-4S16-S	Emergency
	4 zone (feedthrough) switching module. Includes QS communication link and 4 groups of inputs for sensors and wallstations. Dimensions: 13.25 inx 9.25 inx 3.16 in	
1	PP-120H	
	Power Pack 120V, active high, sources 24VDC to upto 3 devices - occupancy sensors and auxiliary power packs, complies with requirements for use in a compartment handling conditioned air (plenum), Relay ratings: 20A - 120/230/277V ballast, 15A - 347V ballast, 13A - 120V incandescent.	
	SNACK BAR B105	
1	QSGRJ-3P-WH	
	GRAFIK Eye QS 3 zone control unit capable of setting 16 preset scenes of lighting, four of which are selectable on face of unit, and 0 shade columns. The unit contains a 434 mhz radio frequency antenna for wireless functionality. The GRAFIK Eye has wireless interconnects to Lutron wireless devices such as occupancy sensors and keypads. Features include an adjustable 0 second to 60 minute fade rate per scene, an integral infrared receiver, and an integral astronomic timeclock. Control mounts in a standard 4-gang US wallbox, 2 3/4 in min. depth (3 1/2 in recommended). Dimensions (inches (mm)): 4 11/16(119)H x 9 3/8(239)W x 3/8(10)D. Unengraved. Unit Color: WHITE	
1	QSWS2-5BI-WH	
	QS device: seeTouch QS 5-button wallstation. Two contact closure inputs via a connector on the back of the wallstation. Dimensions: 116 mm x 70 mm x 76 mm.	
1	LOS-CDT-2000-WH	
	Occupancy sensor - Ceiling mount, dual technology, 2000 sq ft, active high, 20-24VDC, white. Not rated for outdoor use. Contact Engineering.	
	AREA "C" ALTERNATE	
6	LOS-CDT-2000-WH	
	Occupancy sensor - Ceiling mount, dual technology, 2000 sq ft, active high, 20-24VDC, white. Not rated for outdoor use. Contact Engineering.	
2	QSGRJ-6E-1WH	
	GRAFIK Eye QS with EcoSystem 6 zone E120 series control unit capable of setting 16 preset scenes of lighting, four of which are selectable on face of unit, and 1 shade columns. First 3 zones are line-voltage dimming zones and can be optionally programmed to be EcoSystem zones. EcoSystem bus is integral to the unit, supporting up to 64 EcoSystem ballasts, which can be assigned to one of the 6 zones. Integral support for daylight and occupancy sensors attached to EcoSystem ballasts or interfaces, including the ability to link EcoSystem-connected daylight and occcupancy sensors to the 3 line-voltage outputs. The unit contains a 434 mhz radio frequency antenna for wireless functionality. The GRAFIK Eye has wireless interconnects to Lutron wireless devices such as occupancy sensors and keypads. Features include an adjustable 0 second to 60 minute fade rate per scene, an integral infrared receiver, and an integral astronomic timeclock. Control mounts in a standard 4-gang US wallbox, 2 3/4 in min. depth (3 1/2 in recommended). Dimensions (inches (mm)): 4 11/16(119)H x 9 3/8(239)W x 3/8(10)D. Unengraved. Unit Color: WHITE	
2	QSWS2-5BRLI-WH	
	QS device: seeTouch QS 5-button with raise/lower wallstation. Two contact closure inputs via a connector on the back of the wallstation. Dimensions: 116 mm x 70 mm x 76 mm.	
1	GRX-IRPS-WH	
	GRX 3000/4000/5000/6000/7000 partition switch with an infrared sensor	

Job No: 186917 **Date:** 17-Apr-2012

Job Name: DeSales University - Gambet Center - Exterior Lighting Optic **Project ID:** **186917.2.9**

Job Location: Upper Sauccon, PA

1	GRX-12VDC	
	12VDC power supply.	
2	PP-120H	
	Power Pack 120V, active high, sources 24VDC to upto 3 devices - occupancy sensors and auxiliary power packs, complies with requirements for use in a compartment handling conditioned air (plenum), Relay ratings: 20A - 120/230/277V ballast, 15A - 347V ballast, 13A - 120V incandescent.	
3	QSE-IO	
	QS device: 5 Contact Closure Inputs and 5 Relay Outputs for integrating QS based devices. Dimensions mm: 135W x 110H x 27D.	
6	PHPM-PA-DV-WH	
	120/277V dual voltage phase control input phase-adaptive output power module. Dimensions (inches(mm)): 5.1(129.5)H x 6.3(160)W x 1.2(30.5)D. Mounts in a standard 2-gang US wallbox. Mounts in a 4 x 4 in (102 mm), 2.1 in (53 mm) deep US junction box. Mounts in a 4 x 4 in (102 mm), 2.1 in (53 mm) deep US junction box with barrier. Color: WHITE	
2	QSE-CI-NWK-E	
	GRAFIK Eye QS auxiliary equipment interface integrates with user supplied PC or digital AV equipment using TCP/IP or RS232 communication.Dimensions mm: 135W x 110H x 27D.	
1	QSWS2-2BI-WH	
	QS device: seeTouch QS 2-button wallstation. Two contact closure inputs via a connector on the back of the wallstation. Dimensions: 116 mm x 70 mm x 76 mm.	
	<<2ND FLOOR>>	
24	LOS-CDT-2000-WH	
	Occupancy sensor - Ceiling mount, dual technology, 2000 sq ft, active high, 20-24VDC, white. Not rated for outdoor use. Contact Engineering.	
2	QSWS2-2BI-WH	
	QS device: seeTouch QS 2-button wallstation. Two contact closure inputs via a connector on the back of the wallstation. Dimensions: 116 mm x 70 mm x 76 mm.	
2	QSWS2-2BRLI-WH	
	QS device: seeTouch QS 2-button wallstation with raise/lower. Two contact closure inputs via a connector on the back of the wallstation. Dimensions: 116 mm x 70 mm x 76 mm.	
10	QSM2-4W-C	
	434 MHZ QS Sensor Module with 4 wired connections, Ceiling Mount	
5	QSN-4S16-S	Normal
	4 zone (feedthrough) switching module. Includes QS communication link and 4 groups of inputs for sensors and wallstations. Dimensions: 13.25"x 9.25"x 3.16"	
2	QSN-4S16-S	Emergency
	4 zone (feedthrough) switching module. Includes QS communication link and 4 groups of inputs for sensors and wallstations. Dimensions: 13.25 inx 9.25 inx 3.16 in	
	SHEET E103 CLASSROOMS	
6	LOS-CDT-2000-WH	
	Occupancy sensor - Ceiling mount, dual technology, 2000 sq ft, active high, 20-24VDC, white. Not rated for outdoor use. Contact Engineering.	

Job No: 186917 **Date:** 17-Apr-2012

Job Name: DeSales University - Gambet Center - Exterior Lighting Optic **Project ID:** **186917.2.9**

Job Location: Upper Sauccon, PA

6 QSGRJ-6E-WH

GRAFIK Eye QS with EcoSystem 6 zone E120 series control unit capable of setting 16 preset scenes of lighting, four of which are selectable on face of unit, and 0 shade columns. First 3 zones are line-voltage dimming zones and can be optionally programmed to be EcoSystem zones. EcoSystem bus is integral to the unit, supporting up to 64 EcoSystem ballasts, which can be assigned to one of the 6 zones. Integral support for daylight and occupancy sensors attached to EcoSystem ballasts or interfaces, including the ability to link EcoSystem-connected daylight and occcupancy sensors to the 3 line-voltage outputs. The unit contains a 434 mhz radio frequency antenna for wireless functionality. The GRAFIK Eye has wireless interconnects to Lutron wireless devices such as occupancy sensors and keypads. Features include an adjustable 0 second to 60 minute fade rate per scene, an integral infrared receiver, and an integral astronomic timeclock. Control mounts in a standard 4-gang US wallbox, 2 3/4 in min. depth (3 1/2 in recommended). Dimensions (inches (mm)): 4 11/16(119)H x 9 3/8(239)W x 3/8(10)D. Unengraved. Unit Color: WHITE

4 QSWS2-5BRLI-WH

QS device: seeTouch QS 5-button with raise/lower wallstation. Two contact closure inputs via a connector on the back of the wallstation. Dimensions: 116 mm x 70 mm x 76 mm.

6 QSE-CI-NWK-E

GRAFIK Eye QS auxiliary equipment interface integrates with user supplied PC or digital AV equipment using TCP/IP or RS232 communication.Dimensions mm: 135W x 110H x 27D.

CLASSROOMS B211,B214

2 QSGRJ-3P-WH

GRAFIK Eye QS 3 zone control unit capable of setting 16 preset scenes of lighting, four of which are selectable on face of unit, and 0 shade columns. The unit contains a 434 mhz radio frequency antenna for wireless functionality. The GRAFIK Eye has wireless interconnects to Lutron wireless devices such as occupancy sensors and keypads. Features include an adjustable 0 second to 60 minute fade rate per scene, an integral infrared receiver, and an integral astronomic timeclock. Control mounts in a standard 4-gang US wallbox, 2 3/4 in min. depth (3 1/2 in recommended). Dimensions (inches (mm)): 4 11/16(119)H x 9 3/8(239)W x 3/8(10)D. Unengraved. Unit Color: WHITE

4 PHPM-3F-DV-WH

120/277V dual voltage phase control input 3-wire fluorescent output power module. Dimensions (inches(mm)): 5.1(129.5)H x 6.3(160)W x 1.2(30.5)D. Mounts in a standard 2-gang US wallbox. Mounts in a 4 x 4 in (102 mm), 2.1 in (53 mm) deep US junction box. Mounts in a 4 x 4 in (102 mm), 2.1 in (53 mm) deep US junction box with barrier. Color: WHITE

2 LOS-CDT-2000-WH

Occupancy sensor - Ceiling mount, dual technology, 2000 sq ft, active high, 20-24VDC, white. Not rated for outdoor use. Contact Engineering.

***SEMINAR B213,B215 & CONF B233

3 QSGRJ-6E-WH

GRAFIK Eye QS with EcoSystem 6 zone E120 series control unit capable of setting 16 preset scenes of lighting, four of which are selectable on face of unit, and 0 shade columns. First 3 zones are line-voltage dimming zones and can be optionally programmed to be EcoSystem zones. EcoSystem bus is integral to the unit, supporting up to 64 EcoSystem ballasts, which can be assigned to one of the 6 zones. Integral support for daylight and occupancy sensors attached to EcoSystem ballasts or interfaces, including the ability to link EcoSystem-connected daylight and occcupancy sensors to the 3 line-voltage outputs. The unit contains a 434 mhz radio frequency antenna for wireless functionality. The GRAFIK Eye has wireless interconnects to Lutron wireless devices such as occupancy sensors and keypads. Features include an adjustable 0 second to 60 minute fade rate per scene, an integral infrared receiver, and an integral astronomic timeclock. Control mounts in a standard 4-gang US wallbox, 2 3/4 in min. depth (3 1/2 in recommended). Dimensions (inches (mm)): 4 11/16(119)H x 9 3/8(239)W x 3/8(10)D. Unengraved. Unit Color: WHITE

Job No: 186917 **Date:** 17-Apr-2012

Job Name: DeSales University - Gambet Center - Exterior Lighting Optic **Project ID:** **186917.2.9**

Job Location: Upper Sauccon, PA

3 LOS-CDT-2000-WH

Occupancy sensor - Ceiling mount, dual technology, 2000 sq ft, active high, 20-24VDC, white. Not rated for outdoor use. Contact Engineering.

1 QSWS2-5BRLI-WH

QS device: seeTouch QS 5-button with raise/lower wallstation. Two contact closure inputs via a connector on the back of the wallstation. Dimensions: 116 mm x 70 mm x 76 mm.

1 QSE-CI-NWK-E

GRAFIK Eye QS auxiliary equipment interface integrates with user supplied PC or digital AV equipment using TCP/IP or RS232 communication.Dimensions mm: 135W x 110H x 27D.

AREA "A" ALTERNATE

2 QSGRJ-6E-WH

GRAFIK Eye QS with EcoSystem 6 zone E120 series control unit capable of setting 16 preset scenes of lighting, four of which are selectable on face of unit, and 0 shade columns. First 3 zones are line-voltage dimming zones and can be optionally programmed to be EcoSystem zones. EcoSystem bus is integral to the unit, supporting up to 64 EcoSystem ballasts, which can be assigned to one of the 6 zones. Integral support for daylight and occupancy sensors attached to EcoSystem ballasts or interfaces, including the ability to link EcoSystem-connected daylight and occcupancy sensors to the 3 line-voltage outputs. The unit contains a 434 mhz radio frequency antenna for wireless functionality. The GRAFIK Eye has wireless interconnects to Lutron wireless devices such as occupancy sensors and keypads. Features include an adjustable 0 second to 60 minute fade rate per scene, an integral infrared receiver, and an integral astronomic timeclock. Control mounts in a standard 4-gang US wallbox, 2 3/4 in min. depth (3 1/2 in recommended). Dimensions (inches (mm)): 4 11/16(119)H x 9 3/8(239)W x 3/8(10)D. Unengraved. Unit Color: WHITE

2 LOS-CDT-2000-WH

Occupancy sensor - Ceiling mount, dual technology, 2000 sq ft, active high, 20-24VDC, white. Not rated for outdoor use. Contact Engineering.

2 QSWS2-5BRLI-WH

QS device: seeTouch QS 5-button with raise/lower wallstation. Two contact closure inputs via a connector on the back of the wallstation. Dimensions: 116 mm x 70 mm x 76 mm.

2 QSE-CI-NWK-E

GRAFIK Eye QS auxiliary equipment interface integrates with user supplied PC or digital AV equipment using TCP/IP or RS232 communication.Dimensions mm: 135W x 110H x 27D.

EXTERIOR LIGHTING

1 XP16-FT

Pre-assembled switching panel containing sixteen feed-through relays, with a 16A continuous rating per relay circuit. Panel accepts up to sixteen 120-277V, 1 phase, 2 wire, 20A feed-through circuits. Requires a dedicated 120 or 277 volt 20A control circuit, (20A-1P over-current protection, per circuit, by others.) Dimensions (inches(cm)): 24(60)H x 14.375(37)Wx 4.1(10.3)D. Weight (w/o packaging): 35lbs.

1 GRX-CESO-277PKG

Consists of a standard CES/O-12/24-0-10 outdoor sensor from PLC Multipoint, packaged with an LC8 lighting controller from PLC Multipoint and a PP-277H power pack.

1 QSE-IO

QS device: 5 Contact Closure Inputs and 5 Relay Outputs for integrating QS based devices. Dimensions mm: 135W x 110H x 27D.

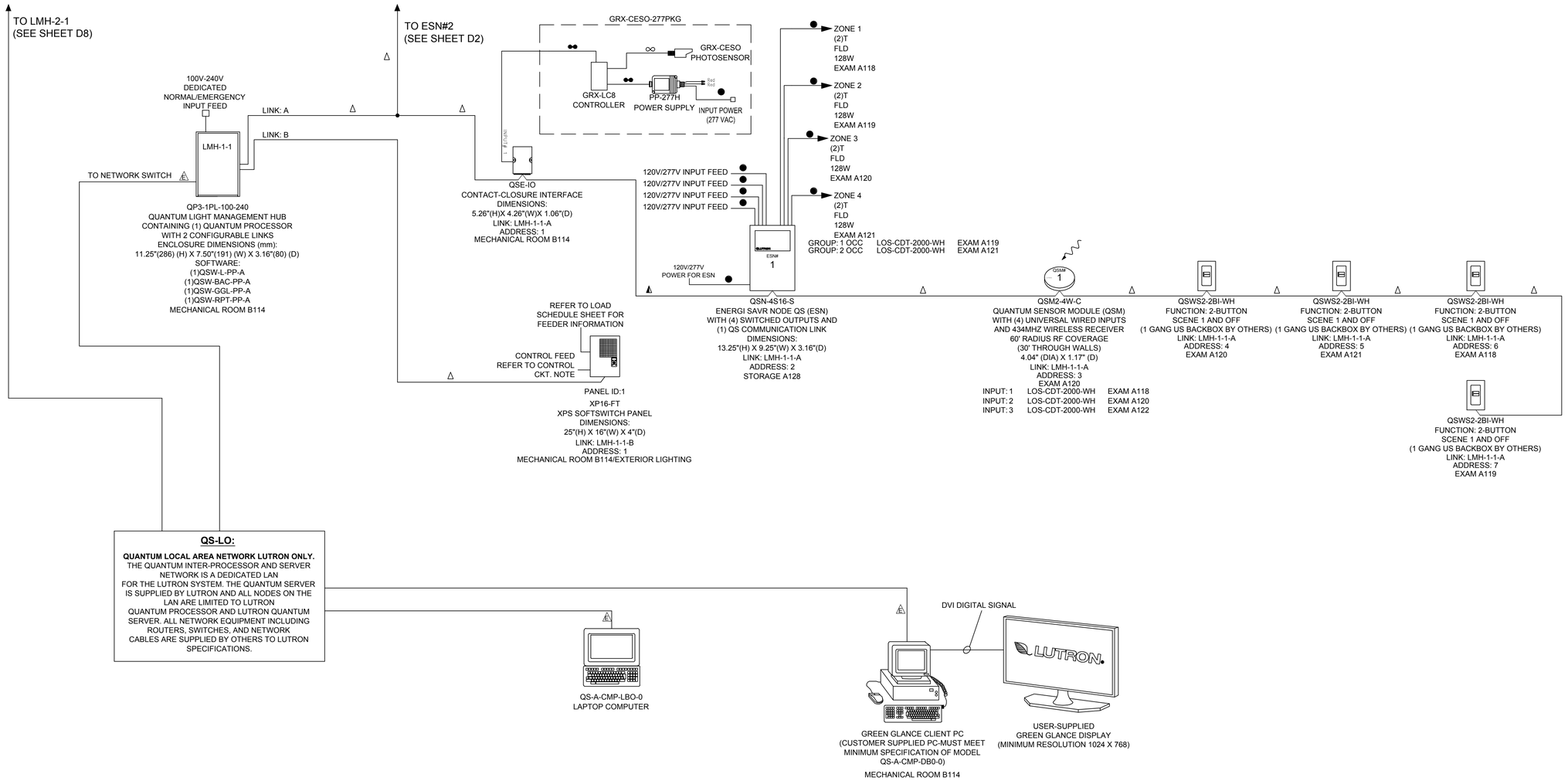
<<STAND-ALONE>>

Job No: 186917 **Date:** 17-Apr-2012

Job Name: DeSales University - Gambet Center - Exterior Lighting Optic **Project ID:** **186917.2.9**

Job Location: Upper Sauccon, PA

4	MRF2-8S-DV-WH	MRF 8A Dual Volt Switch White
4	MRF2-3BRL-L-WH	5 Button Pico Wireless Control. One Pico Can communicate wirelessly with up to 10 Maestro Wireless load controls. Horizontal button configuration includes symbols for On, Preset, Off, and raise/lower - White
8	LRF2-OCR2B-P-WH	Lutron occupancy sensor 1 way FM 434 R2
82	MS-OPS6M-DV-WH	Maestro 6A lighting switch with occupancy/vacancy sensor, multi-location, 120/277V, no neutral required, white
2 Yr Term	LSC-B2	2 year warranty providing 100% replacement parts & 100% Lutron labor coverage with a first-available response time
	LSC-OS-PST-QTM	Quantum System Startup for this system includes the following visits: Quantum Prewire Visit Onsite visit by a Lutron Services Company Representative typically held with the electrical contractor, project manager, and owner's representative to discuss the project scope and timeline. Additionally, the mounting and wiring of system devices, including panels, controls, and sensors is discussed. Quantum Factory Startup Onsite visit by a Lutron Services Company Representative held after Lutron equipment is installed. Equipment installation is verified and system is programmed and tested during this time. Quantum Training Visit Onsite visit by a Lutron Services Company Representative held with the end user of the lighting control system. During this visit, Lutron Services Company Representative provides instruction on system maintenance and operation, including the use of any system software.



GENERAL NOTES

1. The lighting control system (LCS) is processor based and furnished with a factory prepared database.
2. The electrical contractor shall install and wire the LCS equipment per Lutron's installation instructions and specification sheets.
3. All work shall comply with the codes, laws, ordnances, rules and regulations of authorities governing the work.
4. The lighting control system (LCS) supports the following link types:
   - EcoSystem Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK). This link can have up to 8 EcoSystem loops. (See hub details for each hub). Keep ALL the ballasts/modules in one room in the same loop whenever possible. Wire daylight sensor, occupancy sensor and personal control to the closest EcoSystem ballast/module in the same room (see detail 1; for ecosystem wiring details).

     EcoSystem loops are shown on the lighting plans. If there is a discrepancy and rooms are wired to a different loop than the one shown Lutron needs to be notified. This information is important for programming the system.
     ECO-SYSTEM LOOP
     -Up to 64 ballasts/modules per EcoSystem loop
     -Up to 16 daylight sensors per loop
     -Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

     The maximum wire length of a panel or QS Control Stations link is 2,000 feet or 32 power units (1 QS keypad = 1 power unit). A Smart Panel is used to extend the length of a link or to add more power units. For more information on Smart Panels refer to Lutron Spec Sheets.

     If a QS Control Station is moved to another link, Lutron must be notified. This information is important for programming the system.
   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

     The maximum wire length of a panel link is 2,000 feet. a MX-RPTR is used to extend the length of a link another 2,000 feet. a maximum of (3) MX-RPTR's may be used per link for maximum length of 8,000 feet per link.

     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

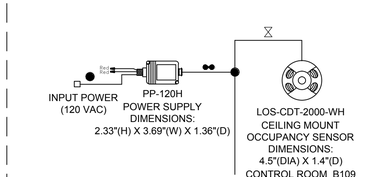
DO NOT MIX PANELS, QS DEVICES AND ECOSYSTEM CONTROLS ON THE SAME LINK.

WIRING NOTES:

- ● 2 #12AWG (2.5 mm²)
- ○ 3 #12AWG (2.5 mm²)
- ◆ 0-10V Signal: 2 #18 AWG
- ●● 2 #18 AWG
- ○○ 3 #18 AWG
- ▽ Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- ⧗ Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
- □ 120V Input Power
- △ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
- ◭ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between; panels add 1 #18 AWG (1.0mm²) for emergency sensing. NOTE: MAKE CONNECTION TO PINS 1, 3 & 4 ONLY - DO NOT CONNECT TO PIN #2 (POWER).
- ◇ EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- ⚠ CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
- ⚠ Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode Fiber).

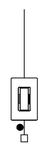
STAND ALONE DEVICES

CONTROL ROOM B109



QUANTITY: 1

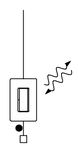
VS



(1) MS-OPS6M-DV-WH
MAESTRO MULTI-LOCATION/SINGLE-POLE
120V DIGITAL FADE DIMMER
DIMENSIONS: 4.69"(H) X 2.94"(W) X 0.30"(D)
LOCATION TBD

QUANTITY: 82

OS



(1) MRF2-8S-DV-WH
MAESTRO WIRELESS
8A, 120/277V
COMMERCIAL SWITCH
(1) CW-1-WH PER WALLSTATION
CLARO 1 GANG WALLPLATE
(1 GANG US BACKBOX BY OTHERS)
LOCATION TBD

QUANTITY: 4

^{3}

MRF2-3BRL-L-WH
434 MHZ PICO WIRELESS
3 BUTTON CONTROL WITH RAISE/LOWER
SHOWN WITH CW-1-WH
CLARO WALLPLATE
PICO DIMENSIONS:
2.61"(H) X 1.28"(W) X 0.37"(D)
W/WALLPLATE:
4.69"(H) X 2.94"(W) X 0.37"(D)
*SEE SPECIFICATION SHEET FOR
MOUNTING INSTRUCTIONS
LOCATION TBD

QUANTITY: 4

VS

LRF2-OCR2B-P-WH
434MHZ WIRELESS
OCCUPANCY/VACANCY SENSOR
4.0"(DIA) X 1.3"(D)
MAX # PER QSM
*DEVICE IS SURFACE-MOUNTED AND
BATTERY POWERED, DOES NOT
REQUIRE POWER FEED

LOCATION TBD

QUANTITY: 8

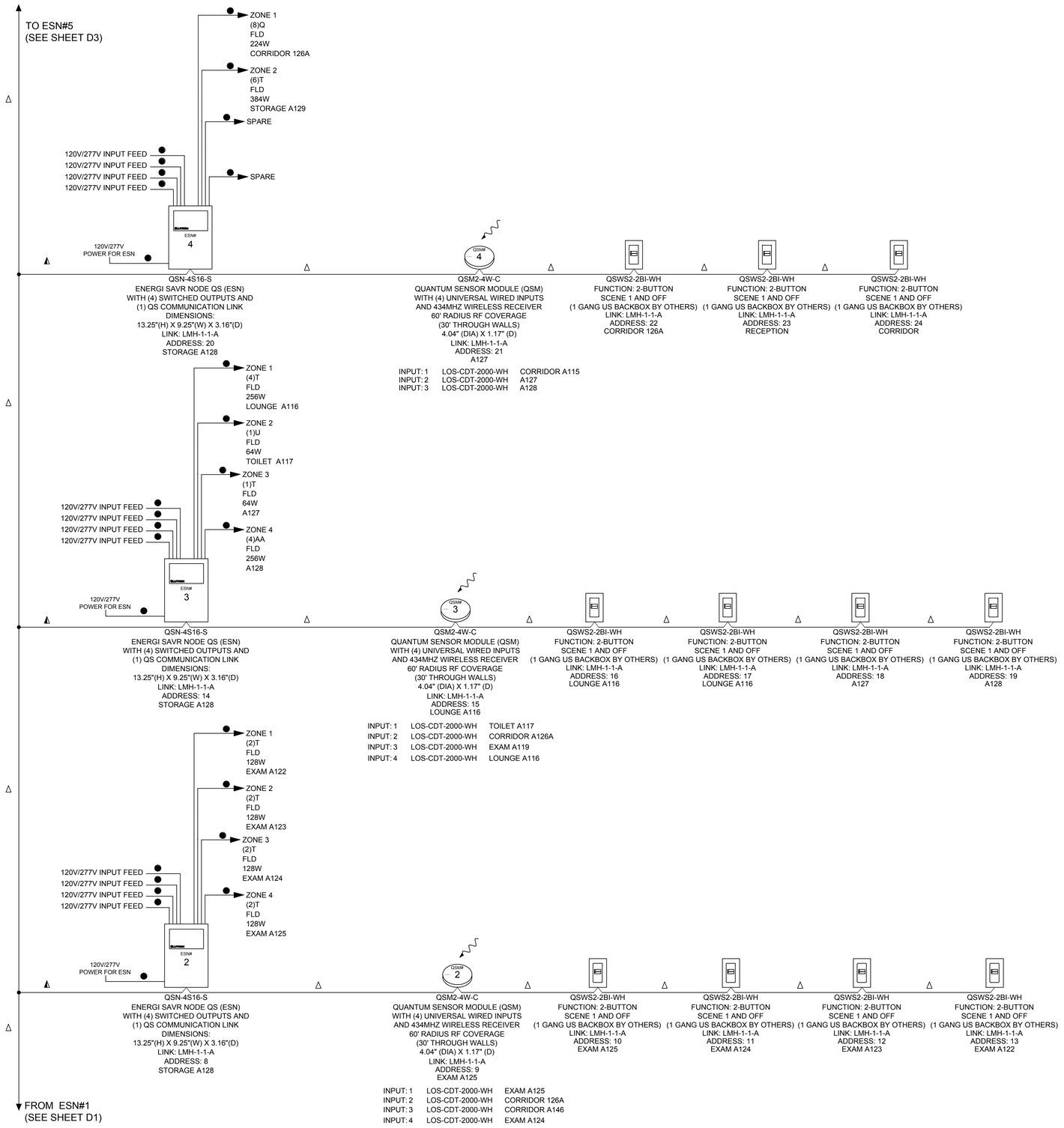
DESALES UNIVERSITY - GAMBET CENTER
1st Floor
UPPER SAUCON, PA

Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/SPK/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D1

LUTRON®
Lutron Electronics Co., Inc.
7200 Suter Road | Coopersburg, PA 18036 | USA
(610) 282-3800 | fax: (610) 282-1146



GENERAL NOTES

1. The lighting control system (LCS) is processor based and furnished with a factory prepared database.
2. The electrical contractor shall install and wire the LCS equipment per Lutron's installation instructions and specification sheets.
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4. The lighting control system (LCS) supports the following link types:
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     EcoSystem loops are shown on the lighting plans. If there is a discrepancy and rooms are wired to a different loop than the one shown Lutron needs to be notified. This information is important for programming the system.
     ECO-SYSTEM LOOP
     -Up to 64 ballasts/modules per EcoSystem loop
     -Up to 16 daylight sensors per loop
     -Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

     The maximum wire length of a panel or QS Control Stations link is 2,000 feet or 32 power units (1 QS keypad = 1 power unit). A Smart Panel is used to extend the length of a link or to add more power units. For more information on Smart Panels refer to Lutron Spec Sheets.

     If a QS Control Station is moved to another link, Lutron must be notified. This information is important for programming the system.
   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

     The maximum wire length of a panel link is 2,000 feet. a MX-RPTR is used to extend the length of a link another 2,000 feet, a maximum of (3) MX-RPTR's may be used per link for maximum length of 8,000 feet per link.

     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

DO NOT MIX PANELS, QS DEVICES AND ECOSYSTEM CONTROLS ON THE SAME LINK.

WIRING NOTES:

- ● 2 #12AWG (2.5 mm²)
- ○ 3 #12AWG (2.5 mm²)
- ◆ 0-10V Signal: 2 #18 AWG
- ●● 2 #18 AWG
- ○○ 3 #18 AWG
- ▽ Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- ⧗ Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
- □ 120V Input Power
- △ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
- ◭ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between; panels add 1 #18 AWG (1.0mm²) for emergency sensing. NOTE: MAKE CONNECTION TO PINS 1, 3 & 4 ONLY - DO NOT CONNECT TO PIN #2 (POWER).
- ◇ EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- ⚠ CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
- ⚠ Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode Fiber).

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1st Floor
UPPER SAUCON, PA

Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D2

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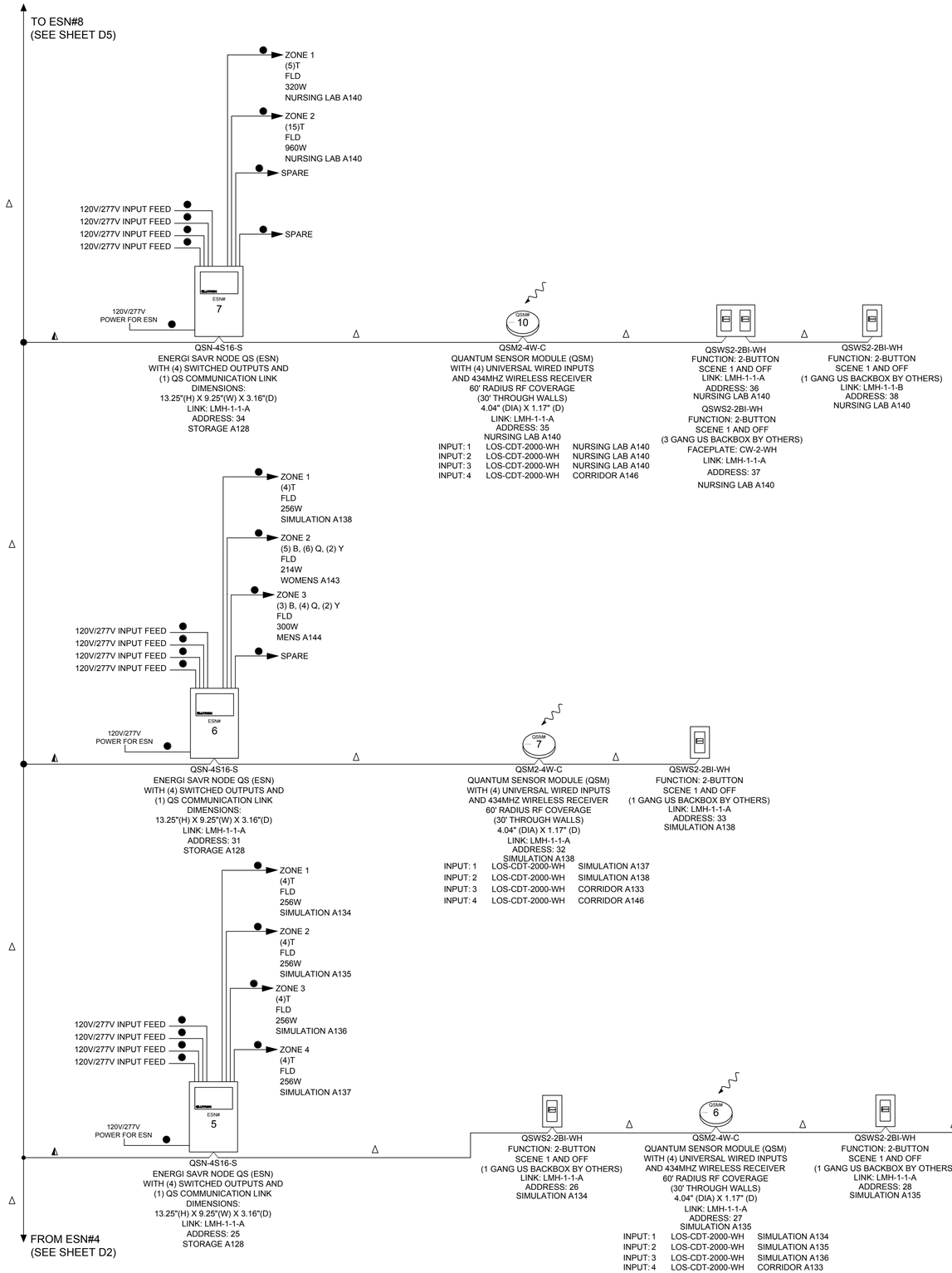

GENERAL NOTES

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2. The electrical contractor shall install and wire the LCS equipment per Lutron's installation instructions and specification sheets.
3. All work shall comply with the codes, laws, ordnances, rules and regulations of authorities governing the work.
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     ECO-SYSTEM LOOP
     -Up to 64 ballasts/modules per EcoSystem loop
     -Up to 16 daylight sensors per loop
     -Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

     The maximum wire length of a panel or QS Control Stations link is 2,000 feet or 32 power units (1 QS keypad = 1 power unit). A Smart Panel is used to extend the length of a link or to add more power units. For more information on Smart Panels refer to Lutron Spec Sheets.

     If a QS Control Station is moved to another link, Lutron must be notified. This information is important for programming the system.
   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

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     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

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WIRING NOTES:

- ● 2 #12AWG (2.5 mm²)
- ○ 3 #12AWG (2.5 mm²)
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- ●● 2 #18 AWG
- ○○ 3 #18 AWG
- ⧖ Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- ⧗ Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
- □ 120V Input Power
- △ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
- ◭ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between; panels add 1 #18 AWG (1.0mm²) for emergency sensing. NOTE: MAKE CONNECTION TO PINS 1, 3 & 4 ONLY - DO NOT CONNECT TO PIN #2 (POWER).
- ◇ EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- Ⓐ CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
- Ⓕ Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode Fiber).

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1st Floor
UPPER SAUCON, PA

Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D3

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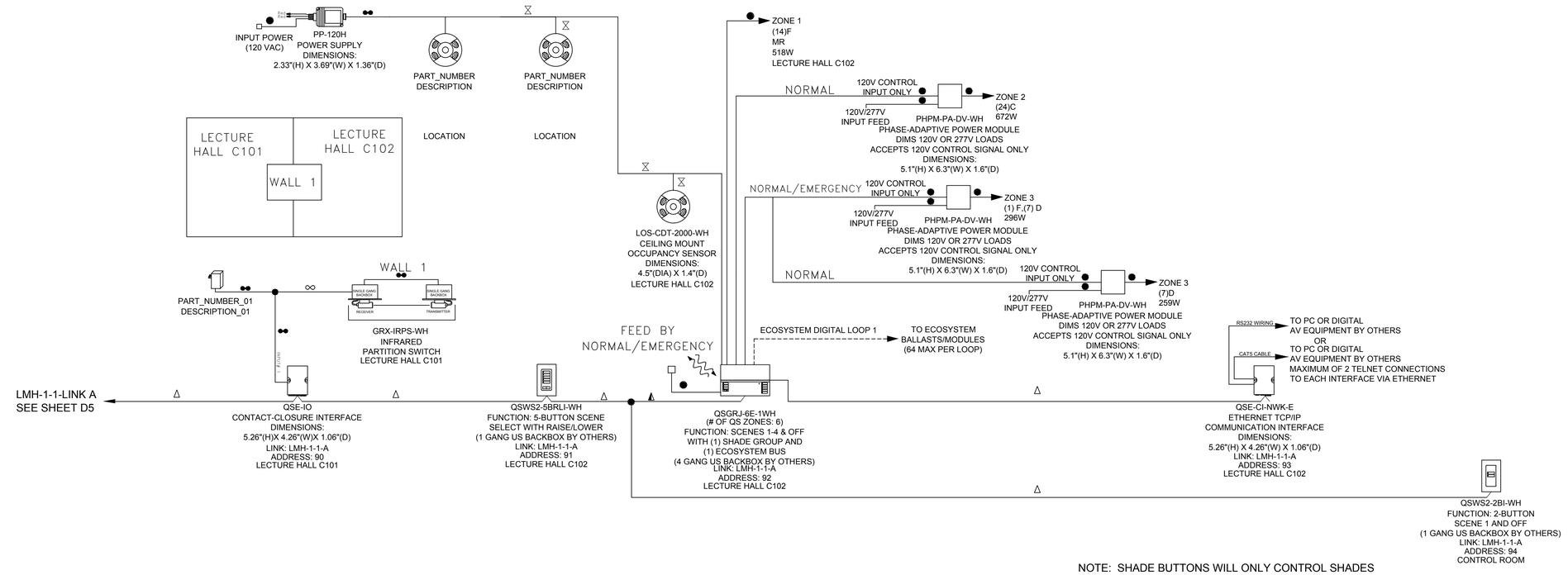

NOTE: SHADE BUTTONS WILL ONLY CONTROL SHADES IN ASSIGNED ROOM. SHADES WILL NOT OPERATE TOGETHER WHEN PARTITION WALL IS OPEN.

GENERAL NOTES

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     -Up to 64 ballasts/modules per EcoSystem loop
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     -Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

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   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

     The maximum wire length of a panel link is 2,000 feet. a MX-RPTR is used to extend the length of a link another 2,000 feet. a maximum of (3) MX-RPTR's may be used per link for maximum length of 8,000 feet per link.

     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

DO NOT MIX PANELS, QS DEVICES AND ECOSYSTEM CONTROLS ON THE SAME LINK.

WIRING NOTES:

- ● 2 #12AWG (2.5 mm²)
- ○ 3 #12AWG (2.5 mm²)
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- □ 120V Input Power
- △ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
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- ◇ EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- ◬ CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
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DESALES UNIVERSITY - GAMBET CENTER
1st Floor
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Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D4

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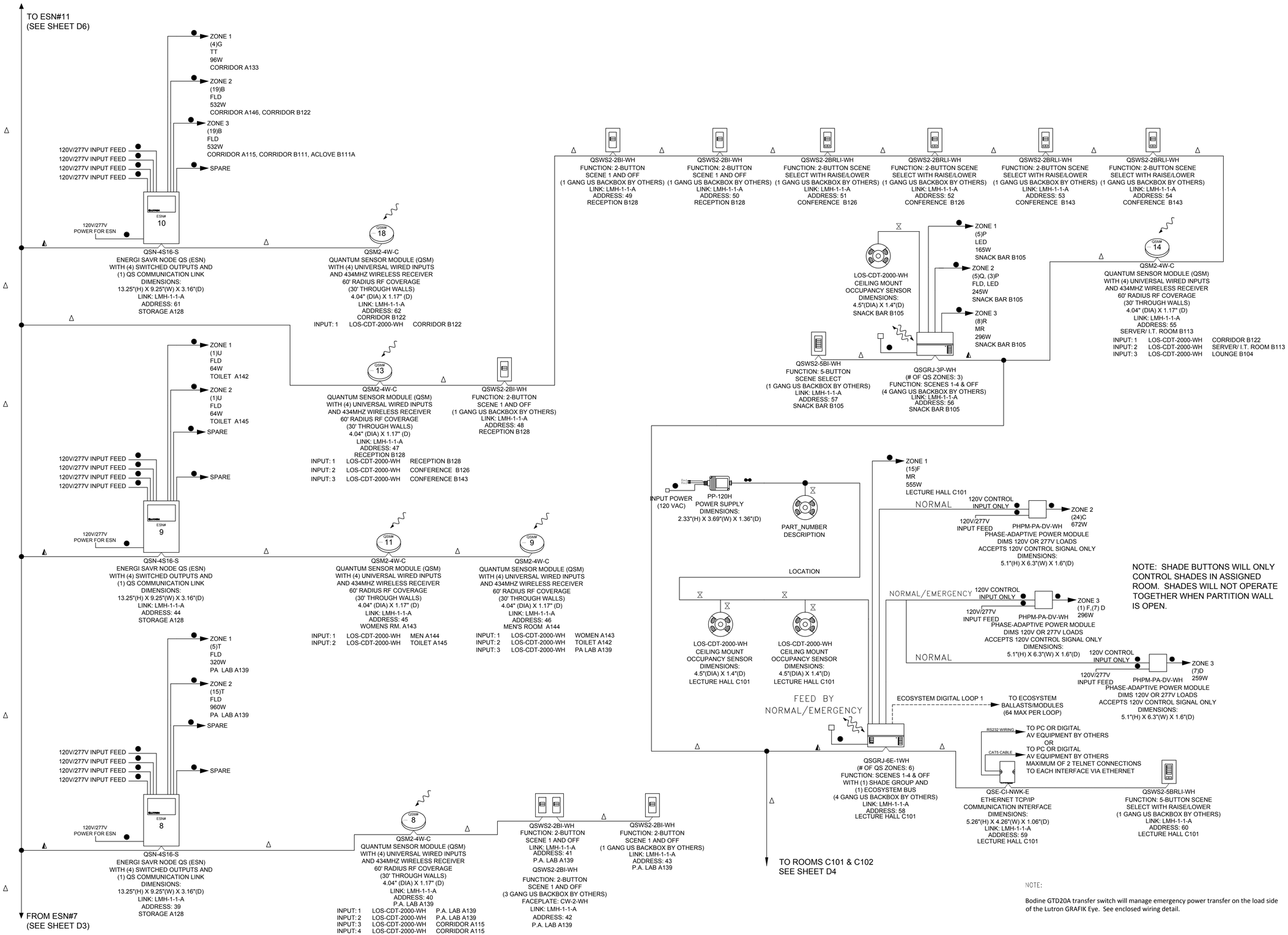

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     EcoSystem loops are shown on the lighting plans. If there is a discrepancy and rooms are wired to a different loop than the one shown Lutron needs to be notified. This information is important for programming the system.
     ECO-SYSTEM LOOP
     - Up to 64 ballasts/modules per EcoSystem loop
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     - Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

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     If a QS Control Station is moved to another link, Lutron must be notified. This information is important for programming the system.
   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

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     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     - Up to 32 circuit selectors per link
     - Up to 512 switch legs or zones per link
     - LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

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WIRING NOTES:

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- ○ 3 #12AWG (2.5 mm²)
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- ◇ EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- ⚠ CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
- ⚠ Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode Fiber).

NOTE:

Bodine GTD20A transfer switch will manage emergency power transfer on the load side of the Lutron GRAFIK Eye. See enclosed wiring detail.

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Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D5

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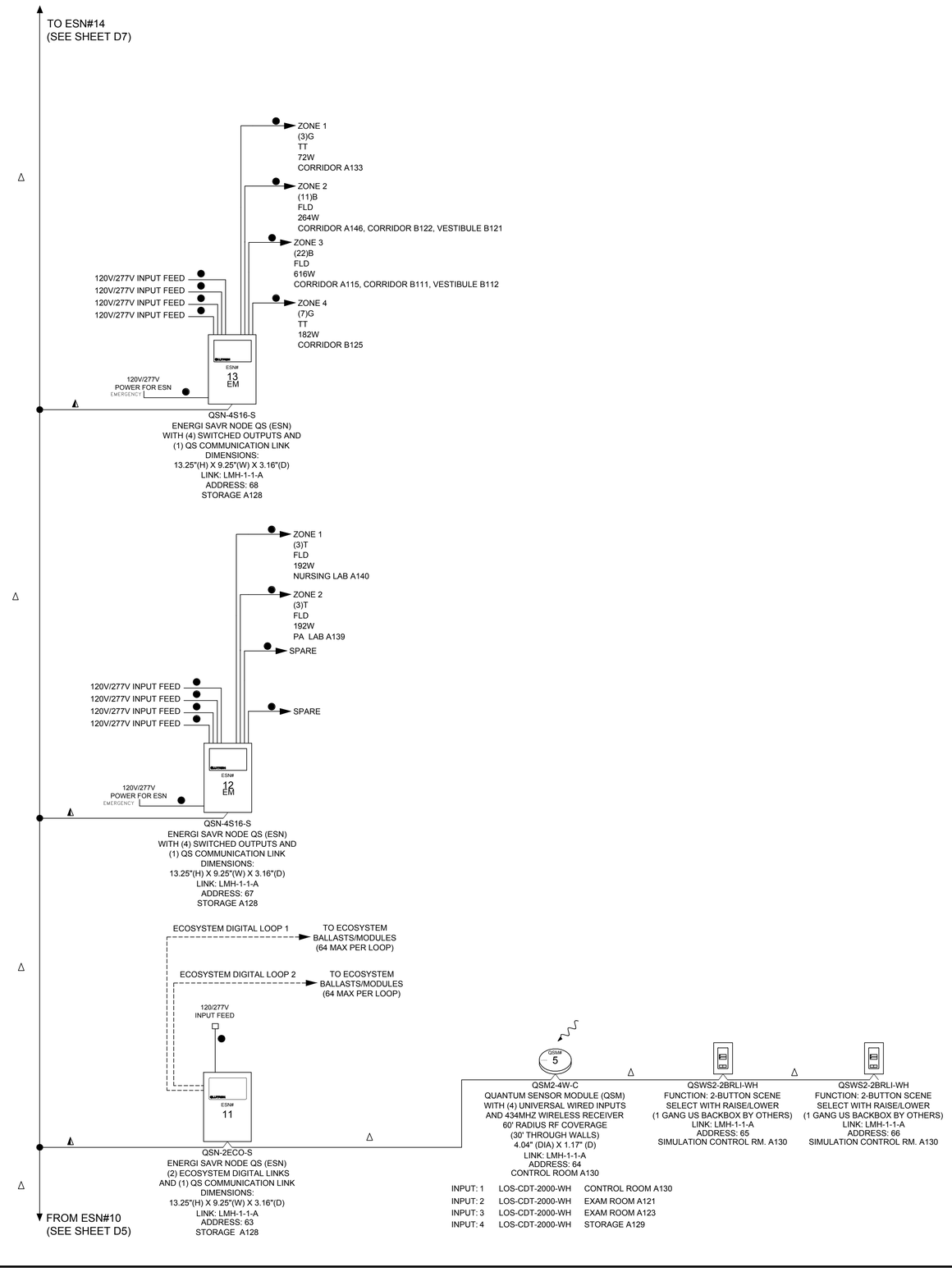

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     POWER PANEL LINK
     - Up to 32 circuit selectors per link
     - Up to 512 switch legs or zones per link
     - LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

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Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D6

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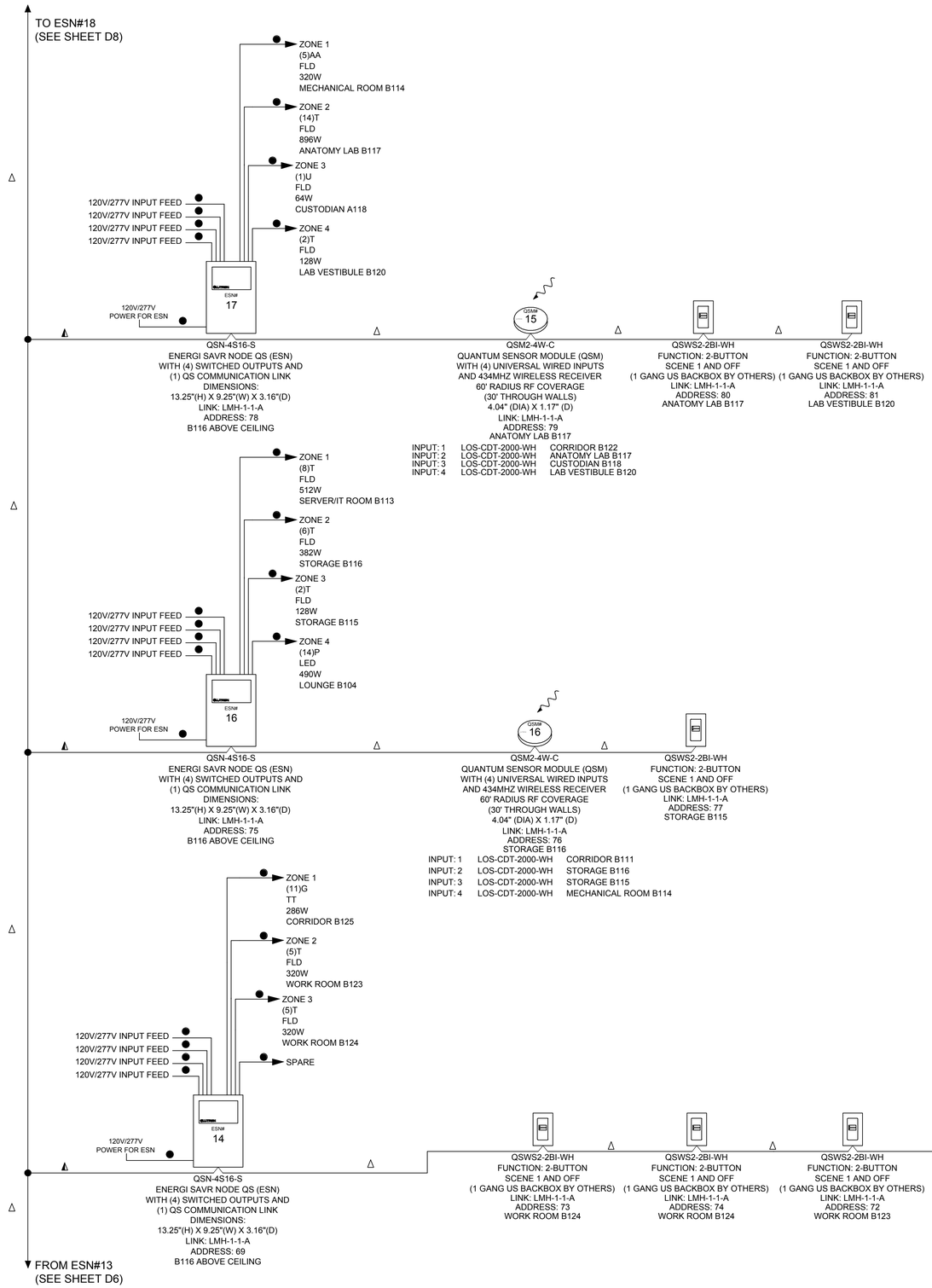

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   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

     The maximum wire length of a panel link is 2,000 feet. a MX-RPTR is used to extend the length of a link another 2,000 feet. a maximum of (3) MX-RPTR's may be used per link for maximum length of 8,000 feet per link.

     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

DO NOT MIX PANELS, QS DEVICES AND ECOSYSTEM CONTROLS ON THE SAME LINK.

WIRING NOTES:

- 2 #12AWG (2.5 mm²)
- 3 #12AWG (2.5 mm²)
- 0-10V Signal: 2 #18 AWG
- 2 #18 AWG
- 3 #18 AWG
- Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
- 120V Input Power
- Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
- Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between; panels add 1 #18 AWG (1.0mm²) for emergency sensing. NOTE: MAKE CONNECTION TO PINS 1, 3 & 4 ONLY - DO NOT CONNECT TO PIN #2 (POWER).
- EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
- Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode Fiber).

DESALES UNIVERSITY - GAMBET CENTER
1st Floor
UPPER SAUCON, PA

Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D7

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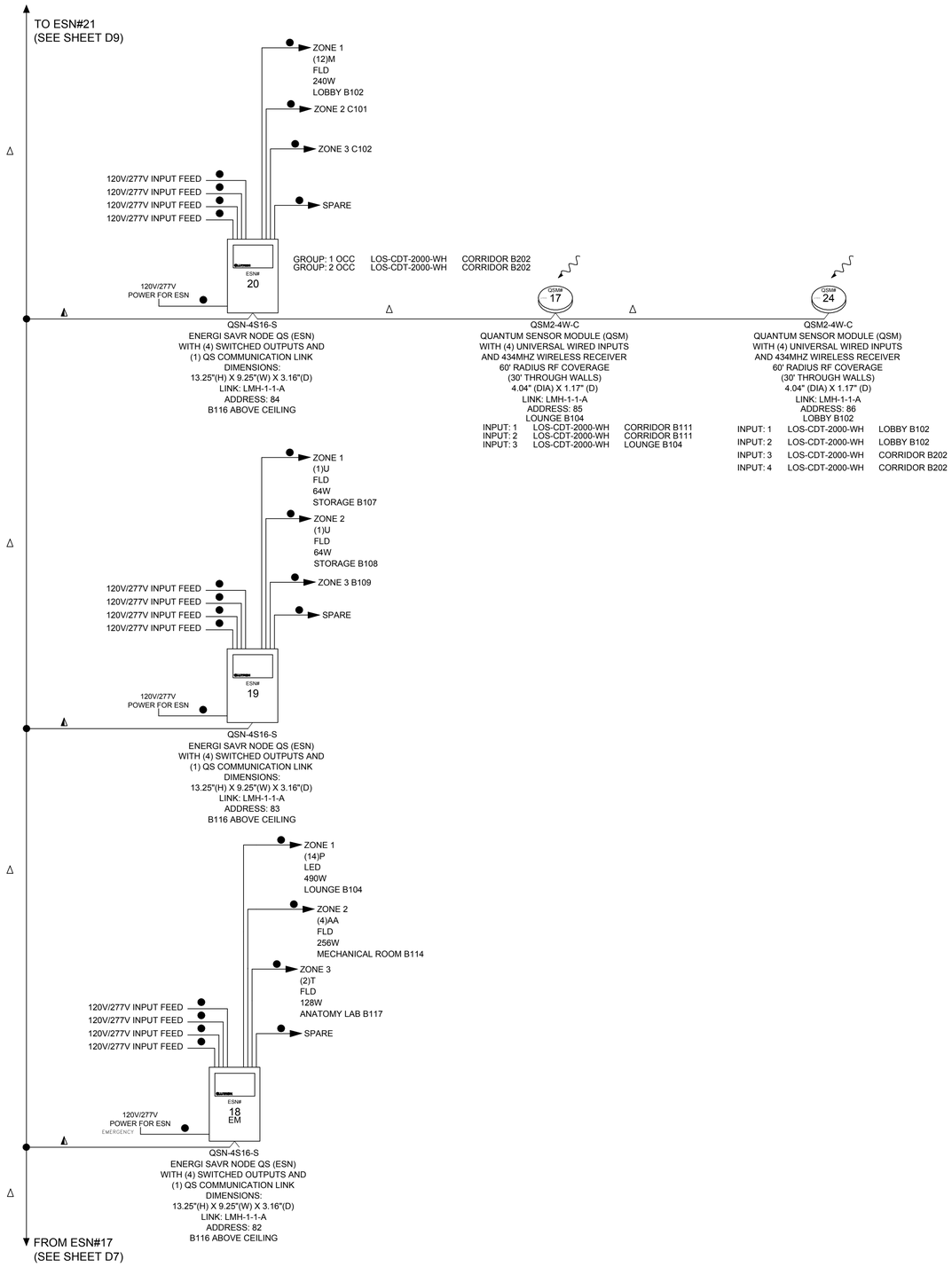

GENERAL NOTES

1. The lighting control system (LCS) is processor based and furnished with a factory prepared database.
2. The electrical contractor shall install and wire the LCS equipment per Lutron's installation instructions and specification sheets.
3. All work shall comply with the codes, laws, ordnances, rules and regulations of authorities governing the work.
4. The lighting control system (LCS) supports the following link types:
   - EcoSystem Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK). This link can have up to 8 EcoSystem loops. (See hub details for each hub). Keep ALL the ballasts/modules in one room in the same loop whenever possible. Wire daylight sensor, occupancy sensor and personal control to the closest EcoSystem ballast/module in the same room (see detail 1; for ecosystem wiring details).

     EcoSystem loops are shown on the lighting plans. If there is a discrepancy and rooms are wired to a different loop than the one shown Lutron needs to be notified. This information is important for programming the system.
     ECO-SYSTEM LOOP
     -Up to 64 ballasts/modules per EcoSystem loop
     -Up to 16 daylight sensors per loop
     -Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

     The maximum wire length of a panel or QS Control Stations link is 2,000 feet or 32 power units (1 QS keypad = 1 power unit). A Smart Panel is used to extend the length of a link or to add more power units. For more information on Smart Panels refer to Lutron Spec Sheets.

     If a QS Control Station is moved to another link, Lutron must be notified. This information is important for programming the system.
   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

     The maximum wire length of a panel link is 2,000 feet. a MX-RPTR is used to extend the length of a link another 2,000 feet. a maximum of (3) MX-RPTR's may be used per link for maximum length of 8,000 feet per link.

     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

DO NOT MIX PANELS, QS DEVICES AND ECOSYSTEM CONTROLS ON THE SAME LINK.

WIRING NOTES:

- ● 2 #12AWG (2.5 mm²)
- ○ 3 #12AWG (2.5 mm²)
- ◆ 0-10V Signal: 2 #18 AWG
- ●● 2 #18 AWG
- ○○ 3 #18 AWG
- ⧖ Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- ⧗ Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
- □ 120V Input Power
- △ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
- ◭ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between; panels add 1 #18 AWG (1.0mm²) for emergency sensing. NOTE: MAKE CONNECTION TO PINS 1, 3 & 4 ONLY - DO NOT CONNECT TO PIN #2 (POWER).
- ◇ EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- ⚠ CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
- ⚠ Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode Fiber).

DESALES UNIVERSITY - GAMBET CENTER 1st Floor

UPPER SAUCON, PA

Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D8

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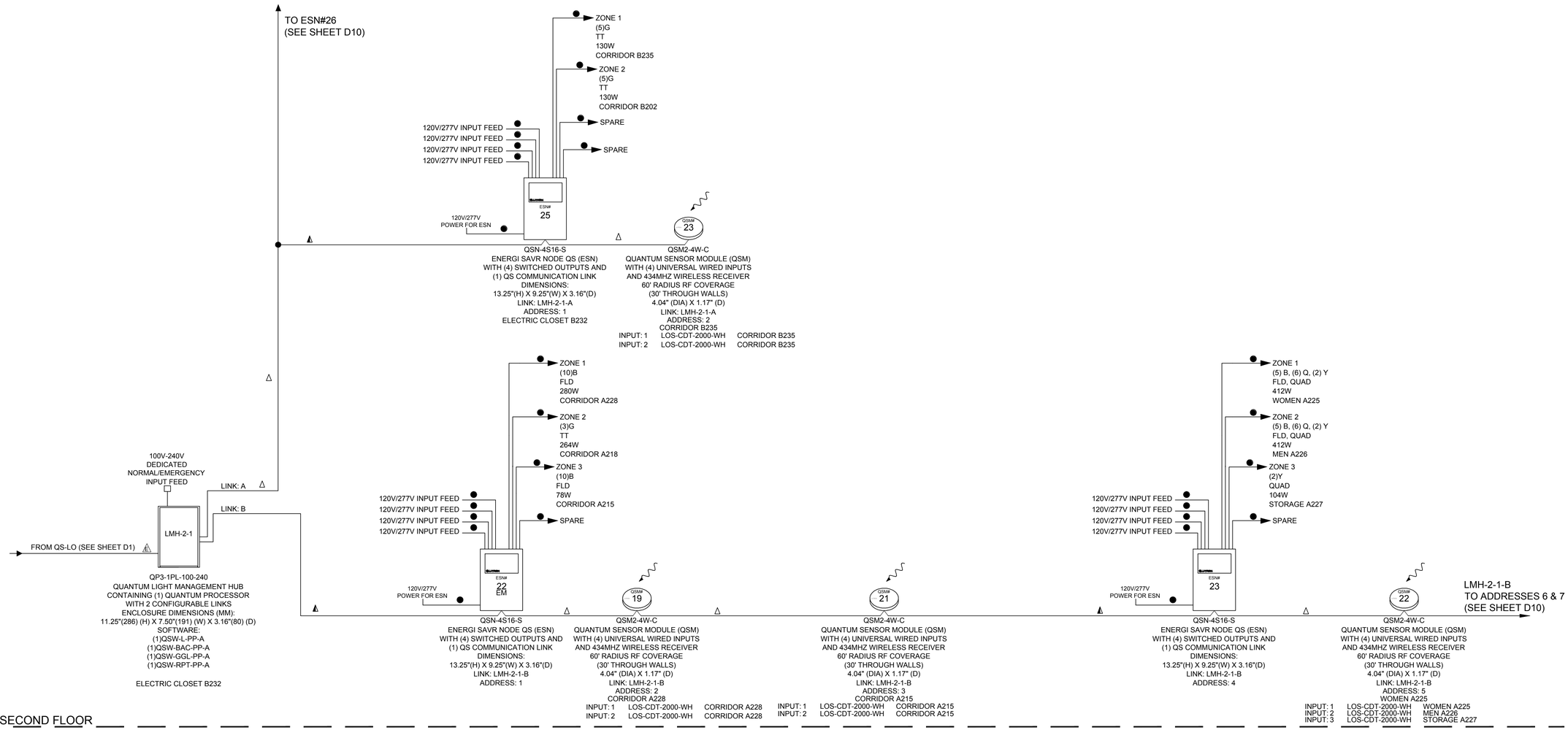

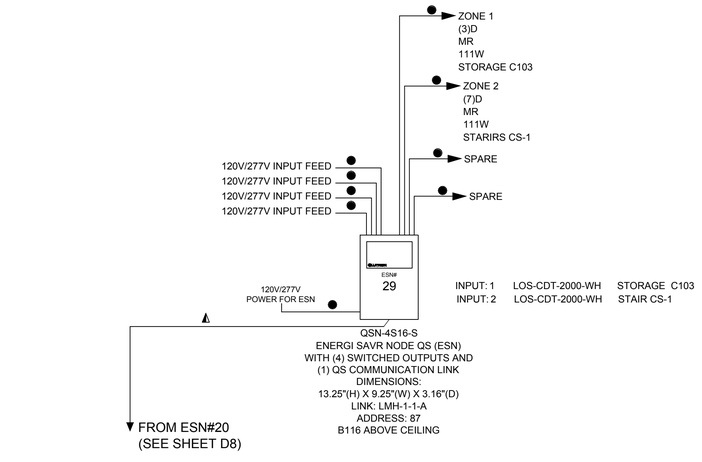

GENERAL NOTES

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2. The electrical contractor shall install and wire the LCS equipment per Lutron's installation instructions and specification sheets.
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     EcoSystem loops are shown on the lighting plans. If there is a discrepancy and rooms are wired to a different loop than the one shown Lutron needs to be notified. This information is important for programming the system.
     ECO-SYSTEM LOOP
     -Up to 64 ballasts/modules per EcoSystem loop
     -Up to 16 daylight sensors per loop
     -Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

     The maximum wire length of a panel or QS Control Stations link is 2,000 feet or 32 power units (1 QS keypad = 1 power unit). A Smart Panel is used to extend the length of a link or to add more power units. For more information on Smart Panels refer to Lutron Spec Sheets.

     If a QS Control Station is moved to another link, Lutron must be notified. This information is important for programming the system.
   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

     The maximum wire length of a panel link is 2,000 feet. a MX-RPTR is used to extend the length of a link another 2,000 feet. a maximum of (3) MX-RPTR's may be used per link for maximum length of 8,000 feet per link.

     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

DO NOT MIX PANELS, QS DEVICES AND ECOSYSTEM CONTROLS ON THE SAME LINK.

WIRING NOTES:

- ● 2 #12AWG (2.5 mm²)
- ○ 3 #12AWG (2.5 mm²)
- ◆ 0-10V Signal: 2 #18 AWG
- ●● 2 #18 AWG
- ○○ 3 #18 AWG
- ⧖ Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- ⧗ Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
- □ 120V Input Power
- △ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
- ◭ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between; panels add 1 #18 AWG (1.0mm²) for emergency sensing. NOTE: MAKE CONNECTION TO PINS 1, 3 & 4 ONLY - DO NOT CONNECT TO PIN #2 (POWER).
- ◇ EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- ⚠1 CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
- ⚠2 Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode fiber).

DESALES UNIVERSITY - GAMBET CENTER
1st & 2nd Floor
UPPER SAUCON, PA

Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D9

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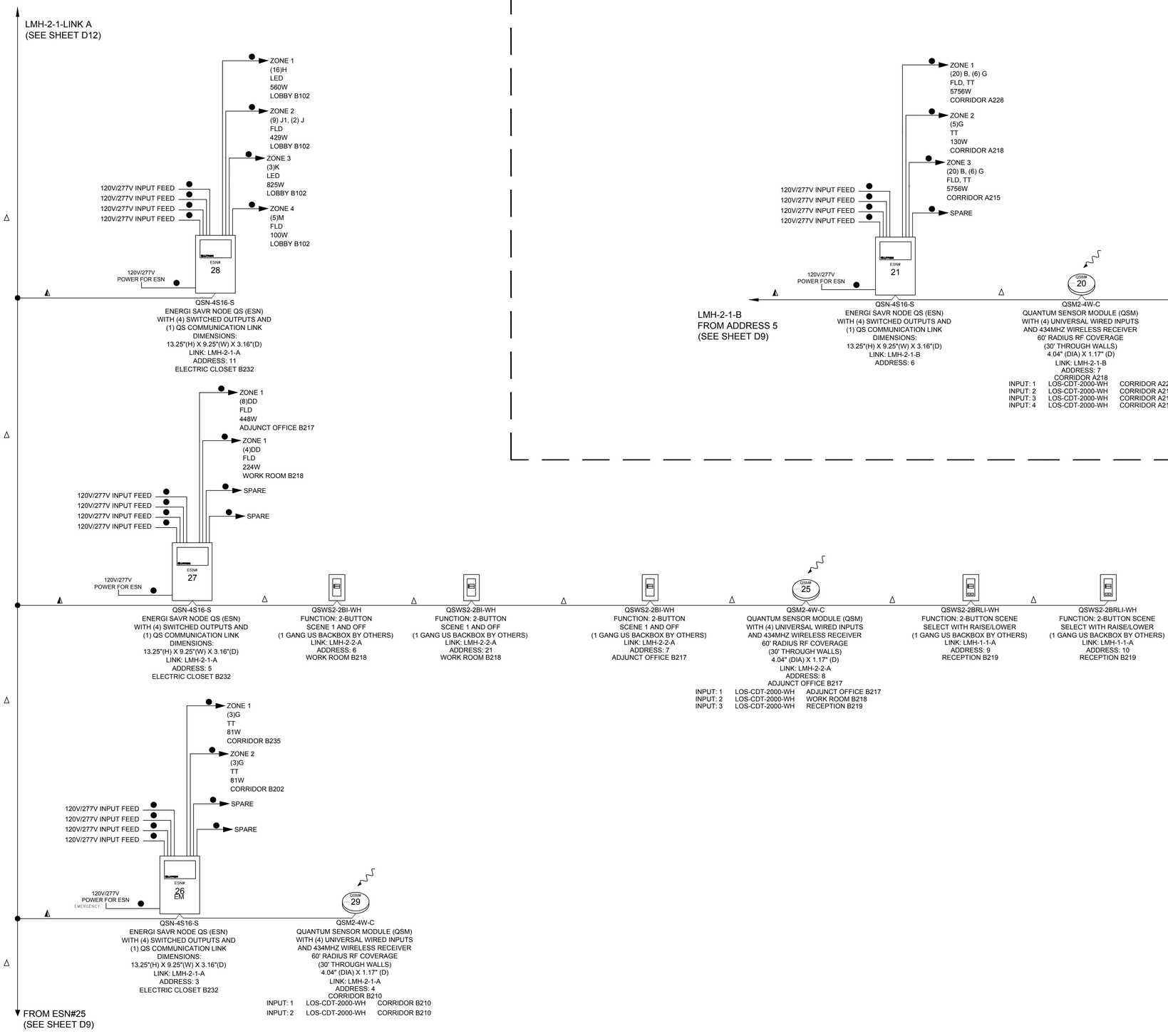

GENERAL NOTES

1. The lighting control system (LCS) is processor based and furnished with a factory prepared database.
2. The electrical contractor shall install and wire the LCS equipment per Lutron's installation instructions and specification sheets.
3. All work shall comply with the codes, laws, ordnances, rules and regulations of authorities governing the work.
4. The lighting control system (LCS) supports the following link types:
   - EcoSystem Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK). This link can have up to 8 EcoSystem loops. (See hub details for each hub). Keep ALL the ballasts/modules in one room in the same loop whenever possible. Wire daylight sensor, occupancy sensor and personal control to the closest EcoSystem ballast/module in the same room (see detail 1; for ecosystem wiring details).

     EcoSystem loops are shown on the lighting plans. If there is a discrepancy and rooms are wired to a different loop than the one shown Lutron needs to be notified. This information is important for programming the system.
     ECO-SYSTEM LOOP
     -Up to 64 ballasts/modules per EcoSystem loop
     -Up to 16 daylight sensors per loop
     -Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

     The maximum wire length of a panel or QS Control Stations link is 2,000 feet or 32 power units (1 QS keypad = 1 power unit). A Smart Panel is used to extend the length of a link or to add more power units. For more information on Smart Panels refer to Lutron Spec Sheets.

     If a QS Control Station is moved to another link, Lutron must be notified. This information is important for programming the system.
   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

     The maximum wire length of a panel link is 2,000 feet. a MX-RPTR is used to extend the length of a link another 2,000 feet. a maximum of (3) MX-RPTR's may be used per link for maximum length of 8,000 feet per link.

     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

DO NOT MIX PANELS, QS DEVICES AND ECOSYSTEM CONTROLS ON THE SAME LINK.

WIRING NOTES:

- 2 #12AWG (2.5 mm²)
- 3 #12AWG (2.5 mm²)
- 0-10V Signal: 2 #18 AWG
- 2 #18 AWG
- 3 #18 AWG
- Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
- 120V Input Power
- Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
- Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between; panels add 1 #18 AWG (1.0mm²) for emergency sensing. NOTE: MAKE CONNECTION TO PINS 1, 3 & 4 ONLY - DO NOT CONNECT TO PIN #2 (POWER).
- EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
- Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode fiber).

DESALES UNIVERSITY - GAMBET CENTER 2nd Floor

UPPER SAUCON, PA

Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D10

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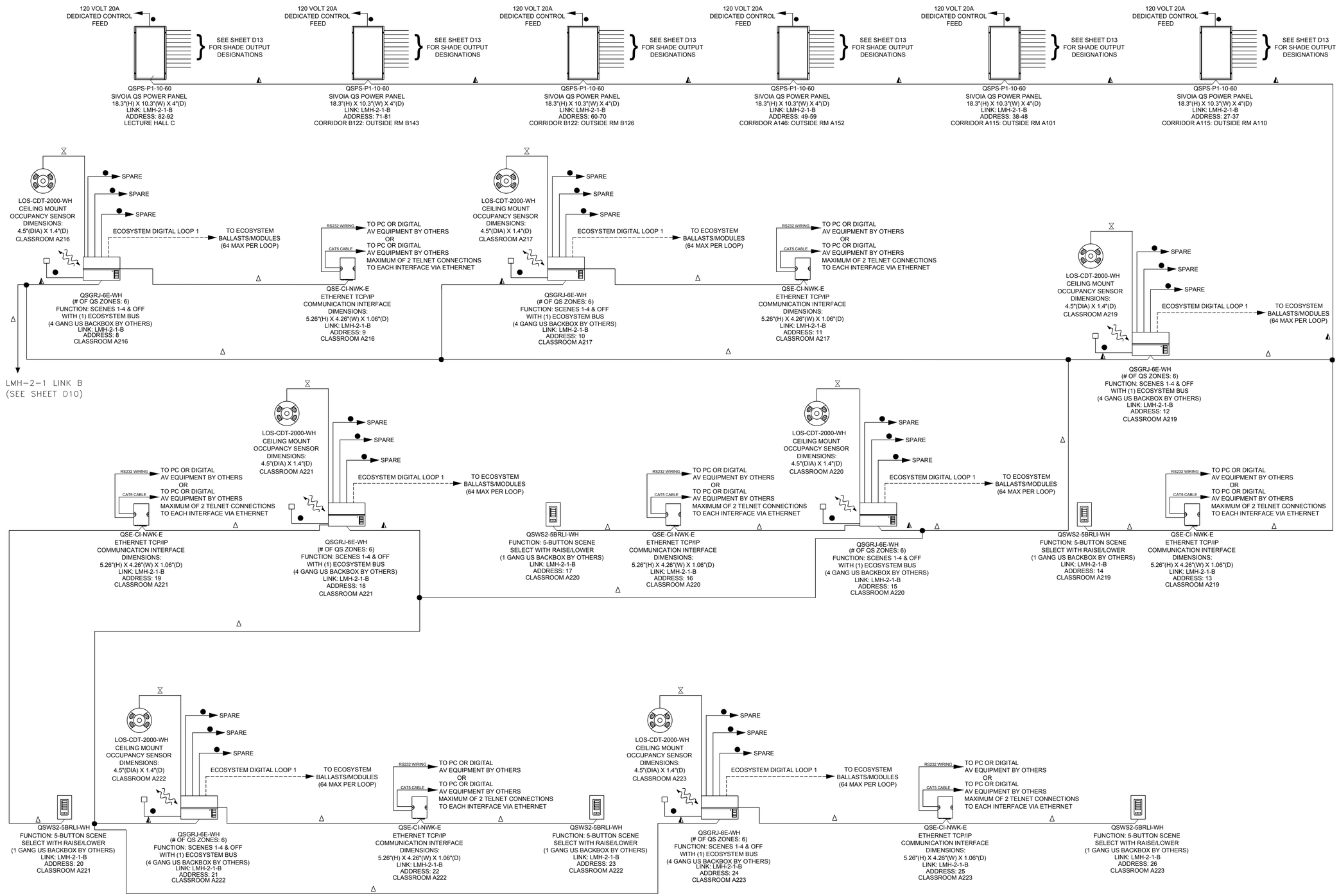

GENERAL NOTES

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     EcoSystem loops are shown on the lighting plans. If there is a discrepancy and rooms are wired to a different loop than the one shown Lutron needs to be notified. This information is important for programming the system.
     ECO-SYSTEM LOOP
     -Up to 64 ballasts/modules per EcoSystem loop
     -Up to 16 daylight sensors per loop
     -Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

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     If a QS Control Station is moved to another link, Lutron must be notified. This information is important for programming the system.
   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

     The maximum wire length of a panel link is 2,000 feet. a MX-RPTR is used to extend the length of a link another 2,000 feet. a maximum of (3) MX-RPTR's may be used per link for maximum length of 8,000 feet per link.

     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

DO NOT MIX PANELS, QS DEVICES AND ECOSYSTEM CONTROLS ON THE SAME LINK.

WIRING NOTES:

- 2 #12AWG (2.5 mm²)
- 3 #12AWG (2.5 mm²)
- 0-10V Signal: 2 #18 AWG
- 2 #18 AWG
- 3 #18 AWG
- Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
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- Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
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DESALES UNIVERSITY - GAMBET CENTER
2nd Floor
UPPER SAUCON, PA

Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D11

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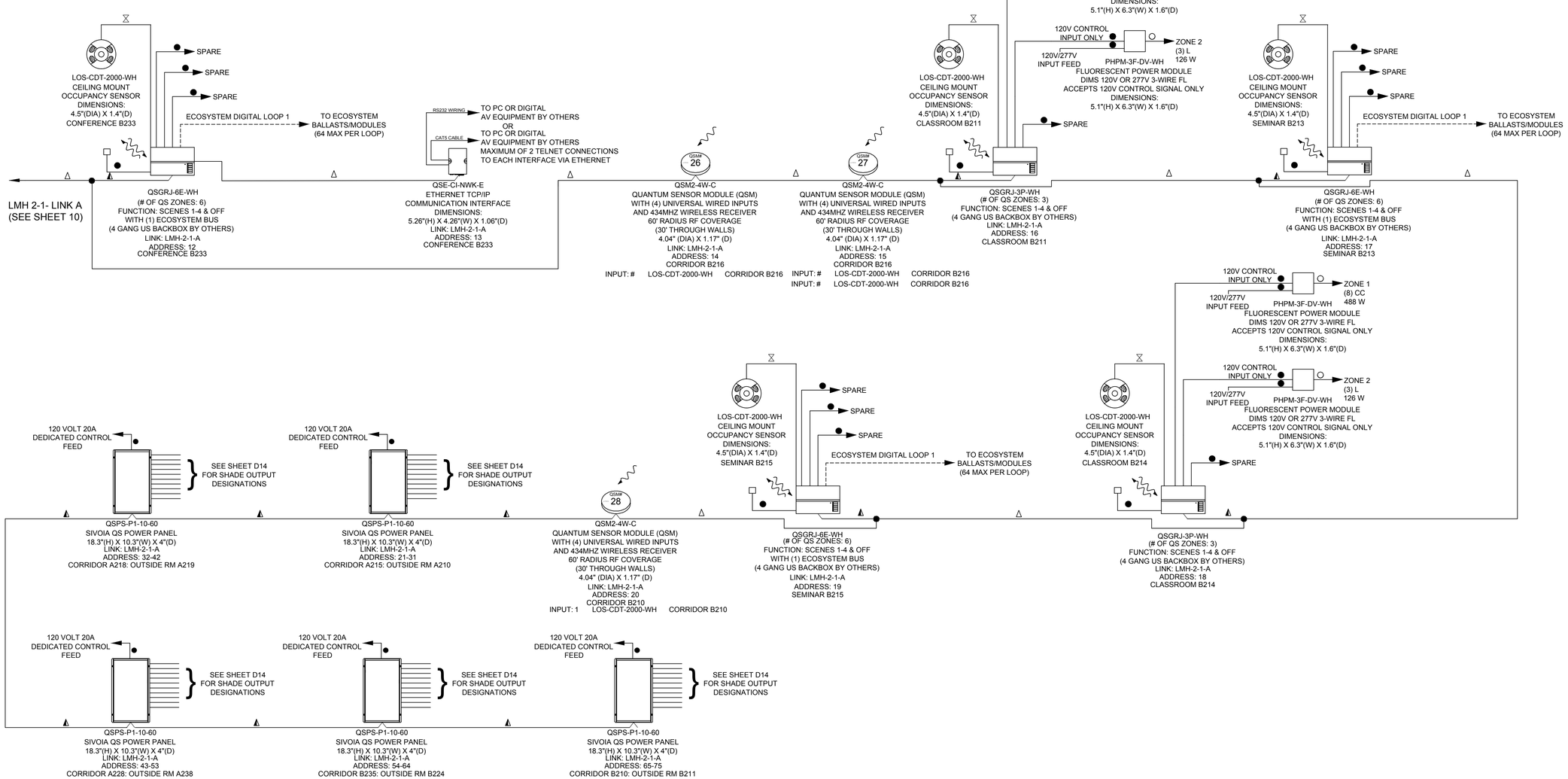

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     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

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- ○ 3 #12AWG (2.5 mm²)
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- ●● 2 #18 AWG
- ○○ 3 #18 AWG
- ⧖ Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- ⧗ Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
- □ 120V Input Power
- △ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
- ◭ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between; panels add 1 #18 AWG (1.0mm²) for emergency sensing. NOTE: MAKE CONNECTION TO PINS 1, 3 & 4 ONLY - DO NOT CONNECT TO PIN #2 (POWER).
- ◇ EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- ⚠ CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
- ⚠ Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode Fiber).

DESALES UNIVERSITY - GAMBET CENTER 2nd Floor

UPPER SAUCON, PA

Quantum System

SYSTEM ONELINE

Project Number:	186917
Drawn By:	KS/JMM/TCW
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D12

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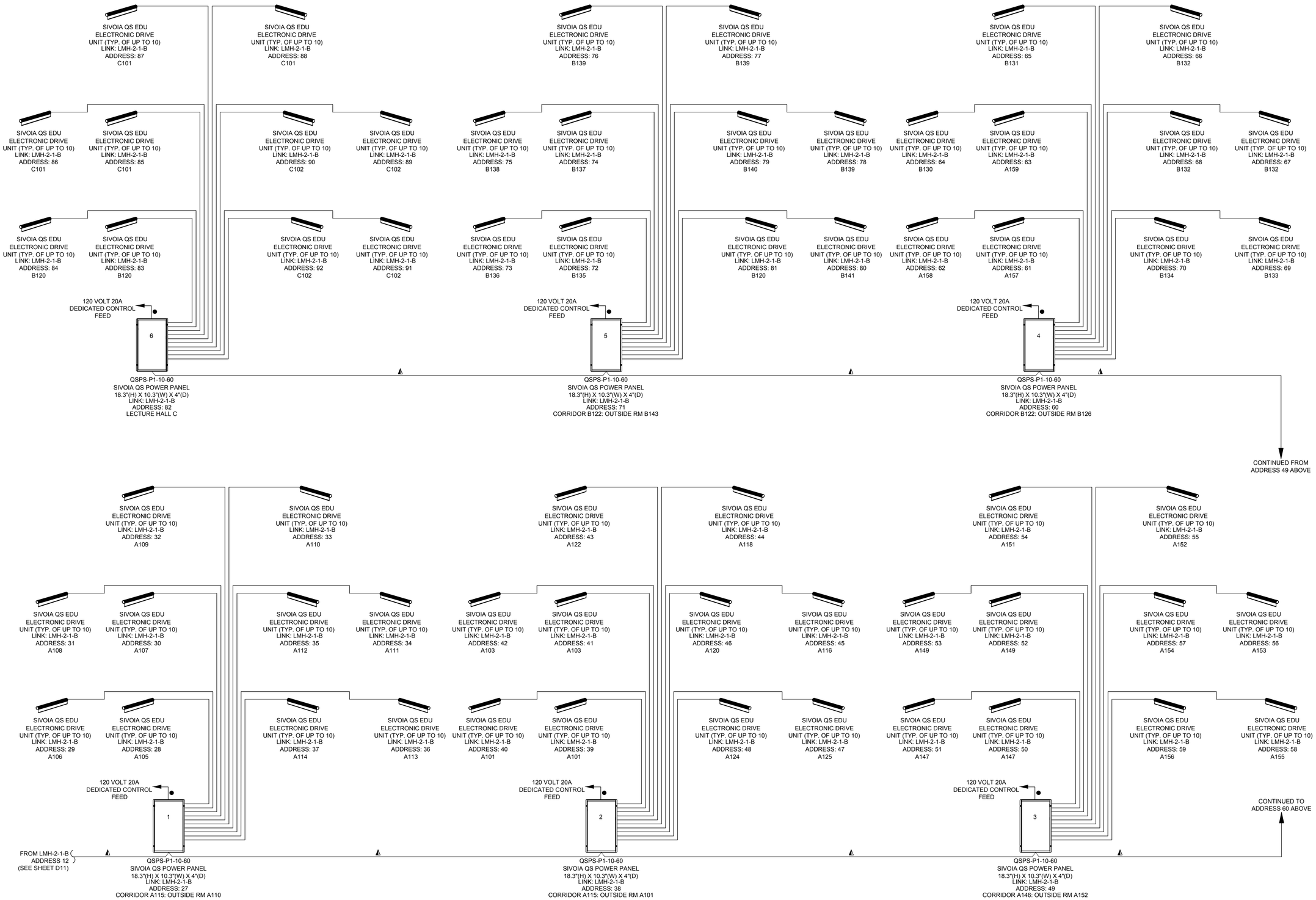

GENERAL NOTES

1. The lighting control system (LCS) is processor based and furnished with a factory prepared database.
2. The electrical contractor shall install and wire the LCS equipment per Lutron's installation instructions and specification sheets.
3. All work shall comply with the codes, laws, ordnances, rules and regulations of authorities governing the work.
4. The lighting control system (LCS) supports the following link types:
   - EcoSystem Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK). This link can have up to 8 EcoSystem loops. (See hub details for each hub). Keep ALL the ballasts/modules in one room in the same loop whenever possible. Wire daylight sensor, occupancy sensor and personal control to the closest EcoSystem ballast/module in the same room (see detail 1; for ecosystem wiring details).

     EcoSystem loops are shown on the lighting plans. If there is a discrepancy and rooms are wired to a different loop than the one shown Lutron needs to be notified. This information is important for programming the system.
     ECO-SYSTEM LOOP
     -Up to 64 ballasts/modules per EcoSystem loop
     -Up to 16 daylight sensors per loop
     -Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

     The maximum wire length of a panel or QS Control Stations link is 2,000 feet or 32 power units (1 QS keypad = 1 power unit). A Smart Panel is used to extend the length of a link or to add more power units. For more information on Smart Panels refer to Lutron Spec Sheets.

     If a QS Control Station is moved to another link, Lutron must be notified. This information is important for programming the system.
   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

     The maximum wire length of a panel link is 2,000 feet. a MX-RPTR is used to extend the length of a link another 2,000 feet. a maximum of (3) MX-RPTR's may be used per link for maximum length of 8,000 feet per link.

     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

DO NOT MIX PANELS, QS DEVICES AND ECOSYSTEM CONTROLS ON THE SAME LINK.

WIRING NOTES:

- 2 #12AWG (2.5 mm²)
- 3 #12AWG (2.5 mm²)
- 0-10V Signal: 2 #18 AWG
- 2 #18 AWG
- 3 #18 AWG
- Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
- 120V Input Power
- Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
- Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between; panels add 1 #18 AWG (1.0mm²) for emergency sensing. NOTE: MAKE CONNECTION TO PINS 1, 3 & 4 ONLY - DO NOT CONNECT TO PIN #2 (POWER).
- EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others), 328 feet (100m) maximum run.
- Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode Fiber).

DESALES UNIVERSITY - GAMBET CENTER 2nd Floor

UPPER SAUCON, PA

Quantum System

SHADE DETAILS

Project Number:	186917
Drawn By:	DAK
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D13

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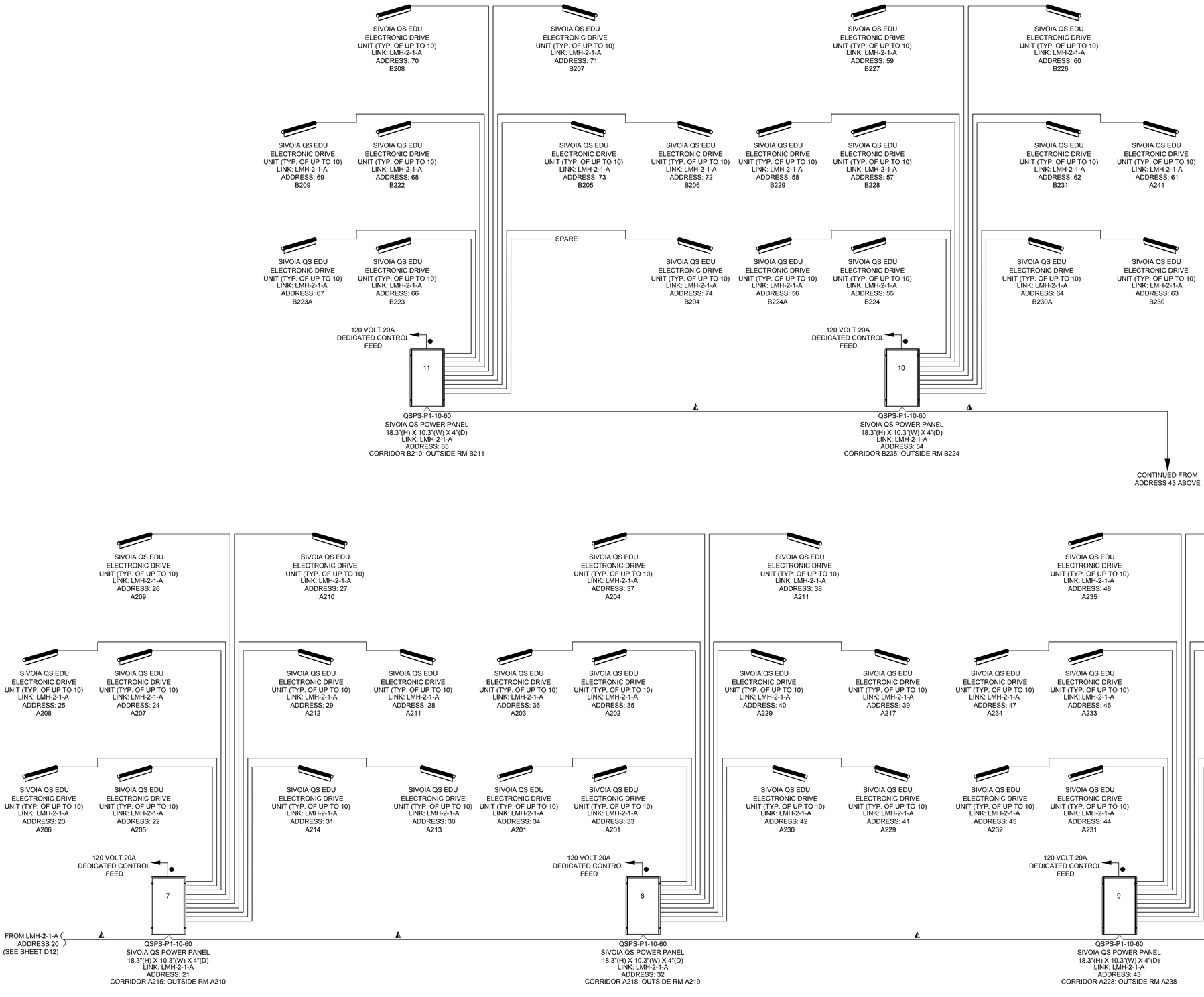

GENERAL NOTES

1. The lighting control system (LCS) is processor based and furnished with a factory prepared database.
2. The electrical contractor shall install and wire the LCS equipment per Lutron's installation instructions and specification sheets.
3. All work shall comply with the codes, laws, ordnances, rules and regulations of authorities governing the work.
4. The lighting control system (LCS) supports the following link types:
   - EcoSystem Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK). This link can have up to 8 EcoSystem loops. (See hub details for each hub). Keep ALL the ballasts/modules in one room in the same loop whenever possible. Wire daylight sensor, occupancy sensor and personal control to the closest EcoSystem ballast/module in the same room (see detail 1: for ecosystem wiring details).

     EcoSystem loops are shown on the lighting plans. If there is a discrepancy and rooms are wired to a different loop than the one shown Lutron needs to be notified. This information is important for programming the system.
     ECO-SYSTEM LOOP
     -Up to 64 ballasts/modules per EcoSystem loop
     -Up to 16 daylight sensors per loop
     -Up to 32 occupant sensors per loop
   - QS Control Station Link: This is a FREE TOPOLOGY WIRING (T-Tap, Home-Run, etc. is OK) link. QS Devices are wired on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. (QS Control Stations can be moved from one processor to another. Maximum 99 devices per link)

     The maximum wire length of a panel or QS Control Stations link is 2,000 feet or 32 power units (1 QS keypad = 1 power unit). A Smart Panel is used to extend the length of a link or to add more power units. For more information on Smart Panels refer to Lutron Spec Sheets.

     If a QS Control Station is moved to another link, Lutron must be notified. This information is important for programming the system.
   - Panels Link: Panels are DAISY-CHAINED on one of the configurable links per Lutron's drawing, however they do not have to be in the order shown. DO NOT Home-Run or t-tap this wiring link. All circuits need to be landed in these panels per Lutron's panel schedules.

     The maximum wire length of a panel link is 2,000 feet. a MX-RPTR is used to extend the length of a link another 2,000 feet. a maximum of (3) MX-RPTR's may be used per link for maximum length of 8,000 feet per link.

     If a panel is moved to another link, or the loads are not wired as shown in Lutron panel schedules, Lutron must be notified. This information is important for programming the system.
     POWER PANEL LINK
     -Up to 32 circuit selectors per link
     -Up to 512 switch legs or zones per link
     -LT-1 link terminators needed on each end of the link

PROGRAMMING NOTES

The control station devices will be programmed to perform as described in the Sequence of Operations. Zone intensities will be programmed to Lutron's default settings unless otherwise specified.

DO NOT MIX PANELS, QS DEVICES AND ECOSYSTEM CONTROLS ON THE SAME LINK.

WIRING NOTES:

- ● 2 #12AWG (2.5 mm²)
- ○ 3 #12AWG (2.5 mm²)
- ◆ 0-10V Signal: 2 #18 AWG
- ●● 2 #18 AWG
- ○○ 3 #18 AWG
- ⧖ Lutron sensor cable C-CBL-522S otherwise use 3 #18 AWG
- ⧗ Lutron sensor cable C-CBL-522S otherwise use 4 #18 AWG
- □ 120V Input Power
- △ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between panels add 1 #18 AWG (1.0mm²) for emergency sensing cable by others.
- ◭ Lutron cable GRX-CBL-46L (5 Conductor Non-Plenum) or 2 #12 AWG (2.5mm²), 1 Belden #9461 and between; panels add 1 #18 AWG (1.0mm²) for emergency sensing. NOTE: MAKE CONNECTION TO PINS 1, 3 & 4 ONLY - DO NOT CONNECT TO PIN #2 (POWER).
- ◇ EcoSystem Bus: Lutron cable C-CBL-216-GR-1 (2 #16 Conductor Non-Plenum) or C-PCBL-216-CL-1 (2 #16 Conductor Plenum rated). Otherwise use 2 #16 AWG by others.
- ◬ CAT5e or better cable for dedicated Lutron network terminated with RJ45 connectors (to be provided by others). 328 feet (100m) maximum run.
- ◬ Fiber Optic Cable for dedicated Lutron network terminated with appropriate Fiber Optic Connectors (to be provided by others). Note: Requires Dedicated Fiber Optic Link (2 strands of single-mode Fiber).

DESALES UNIVERSITY - GAMBET CENTER
2nd Floor
UPPER SAUCON, PA

Quantum System

SHADE DETAILS

Project Number:	186917
Drawn By:	DAK
Drawing Revision:	1
Drawing Date:	09/14/12
Sheet:	D14

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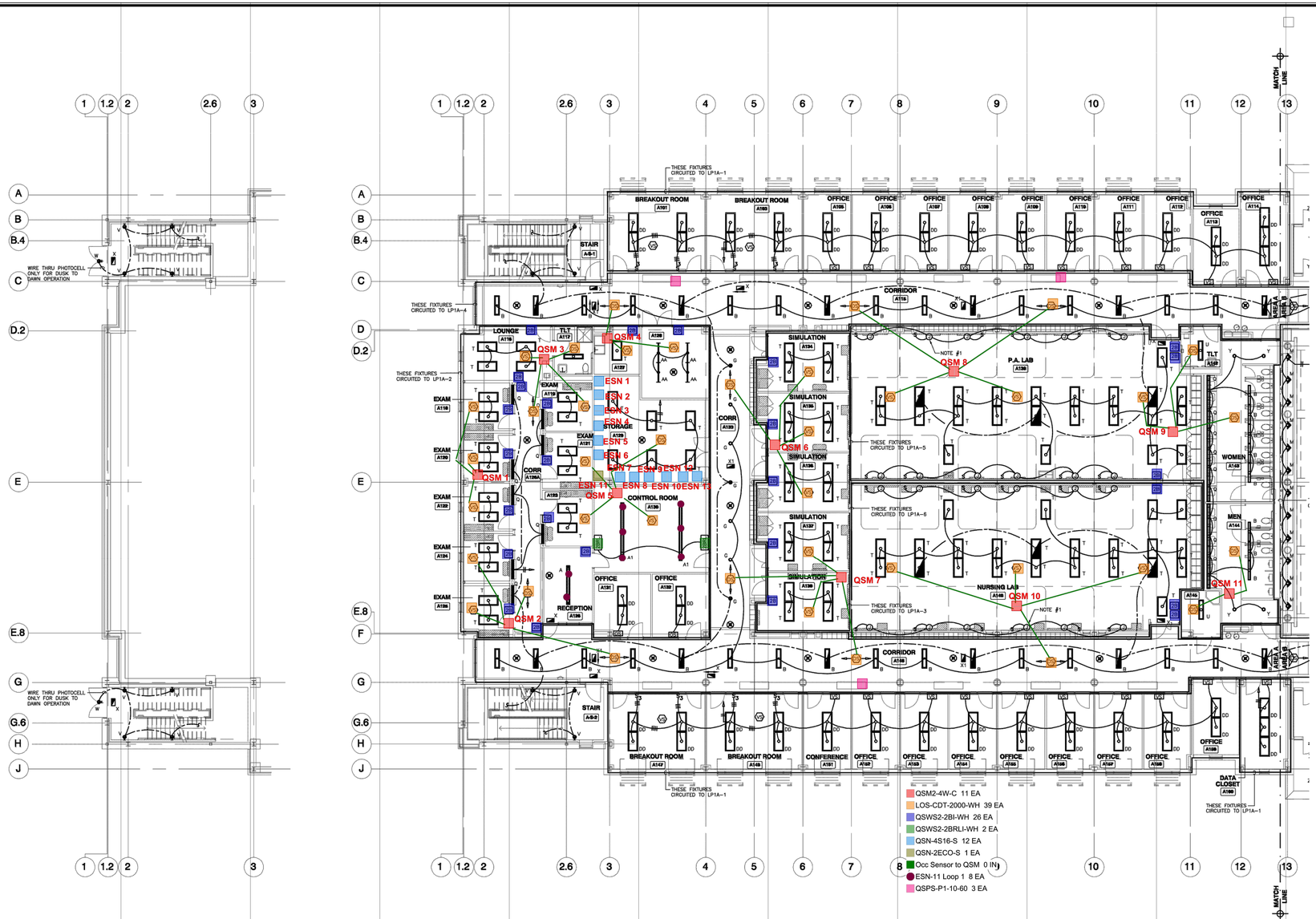

LOWER STAIR PLAN - AREA A - LIGHTING BASE BID

SCALE: 1/8"=1'-0"

REVISED FIRST FLOOR PLAN - AREA A - LIGHTING BASE BID

SCALE: 1/8"=1'-0"

DRAWING NOTES:

1. E.C. SHALL MOUNT A JUNCTION BOX ABOVE THE CEILING FOR WIRING TO LIGHT FIXTURE AND SWITCH PROVIDED BY OTHERS. TYPICAL FOR (12) FIXTURES AND SWITCHES, THIS ROOM. THEY SHALL BE WIRED TO SECOND 2-BUTTON ON/OFF SWITCH IN THIS ROOM.
2. EXIT SIGNS SHALL BE WIRED TO CKT# NE-3.

KEY PLAN

NORTH

11/12/2012 8:08:57 AM

NOTE TO CONTRACTOR:
LUTRON WILL PROGRAM THE QUANTUM SYSTEM PER THESE LOOP LAYOUTS. IF THE SYSTEM CANNOT BE WIRED AS SHOWN, PLEASE CONTACT LUTRON.

ECOSYSTEM LOOP CONTROLS / MODULES

IMPORTANT NOTE REGARDING SENSOR PLACEMENT
THE OCCUPANCY SENSORS & DAYLIGHT SENSORS ON THIS ECOSYSTEM LOOP LAYOUT WERE NOT PLACED BY LUTRON. THIS ECOSYSTEM LOOP LAYOUT ONLY SHOWS THE CONNECTION OF THE SENSORS TO THE APPROPRIATE ECOSYSTEM COMPONENT. THE ACTUAL LOCATIONS OF THE SENSORS SHOULD BE DETERMINED BY FOLLOWING THE LUTRON SPECIFICATION SHEETS AND THE INSTALLATION INSTRUCTIONS.

THIS DRAWING IS NOT TO BE USED FOR GENERAL BUILDING WIRING PURPOSES. ITS INTENT IS TO DISPLAY THE QUANTUM SYSTEM COMPONENTS AND ECOSYSTEM PARTS ONLY. All EcoSystem ballast and modules should be wired to the loop that is shown. This is required for Lutron database programming purposes. Placement of the XPJ, BMJ and BMF modules are show for illustrative purposes only and can be placed anywhere within the rooms/loops.

LUTRON LAYOUT IS BASED UPON:
Drawing By:
Sheet No:
Dated:

Drawing Not To Scale

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UPPER SAUCON, PA

QUANTUM ECOSYSTEM LOOP LAYOUT

FIRST FLOOR - AREA A

Project Number:	186917
Drawn By:	KS/DAK
Drawing Revision:	1
Drawing Date:	09/14/2012
Sheet:	ELL1

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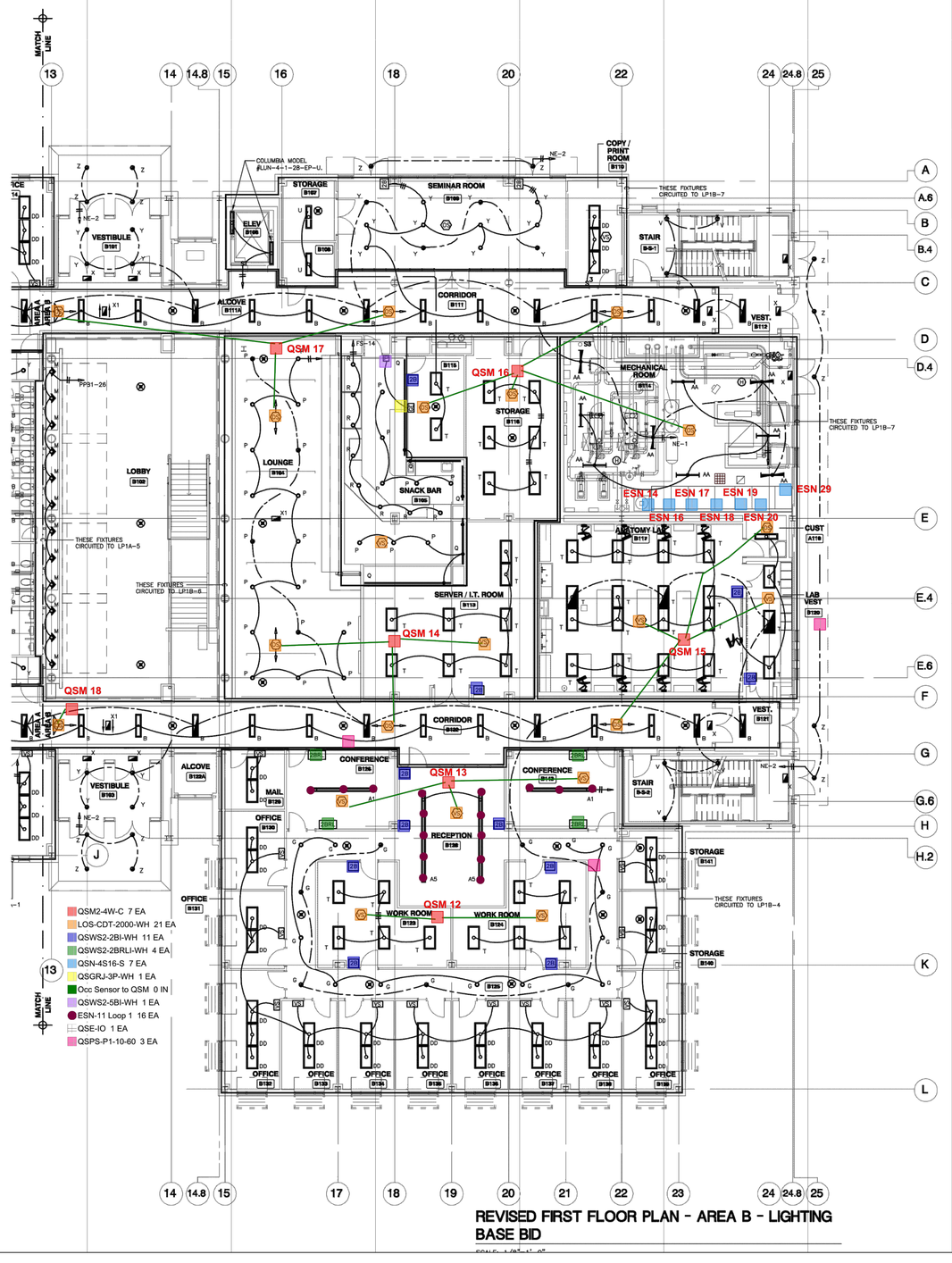

REVISED FIRST FLOOR PLAN - AREA B - LIGHTING BASE BID

NOTE TO CONTRACTOR:
LUTRON WILL PROGRAM THE QUANTUM SYSTEM PER THESE LOOP LAYOUTS. IF THE SYSTEM CANNOT BE WIRED AS SHOWN, PLEASE CONTACT LUTRON.

ECOSYSTEM LOOP CONTROLS / MODULES

IMPORTANT NOTE REGARDING SENSOR PLACEMENT
THE OCCUPANCY SENSORS & DAYLIGHT SENSORS ON THIS ECOSYSTEM LOOP LAYOUT WERE NOT PLACED BY LUTRON. THIS ECOSYSTEM LOOP LAYOUT ONLY SHOWS THE CONNECTION OF THE SENSORS TO THE APPROPRIATE ECOSYSTEM COMPONENT. THE ACTUAL LOCATIONS OF THE SENSORS SHOULD BE DETERMINED BY FOLLOWING THE LUTRON SPECIFICATION SHEETS AND THE INSTALLATION INSTRUCTIONS.

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Drawing By:
Sheet No:
Dated:

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QUANTUM ECOSYSTEM LOOP LAYOUT

FIRST FLOOR - AREA B

Project Number:	186917
Drawn By:	KS/DAK
Drawing Revision:	1
Drawing Date:	09/14/2012
Sheet:	ELL2

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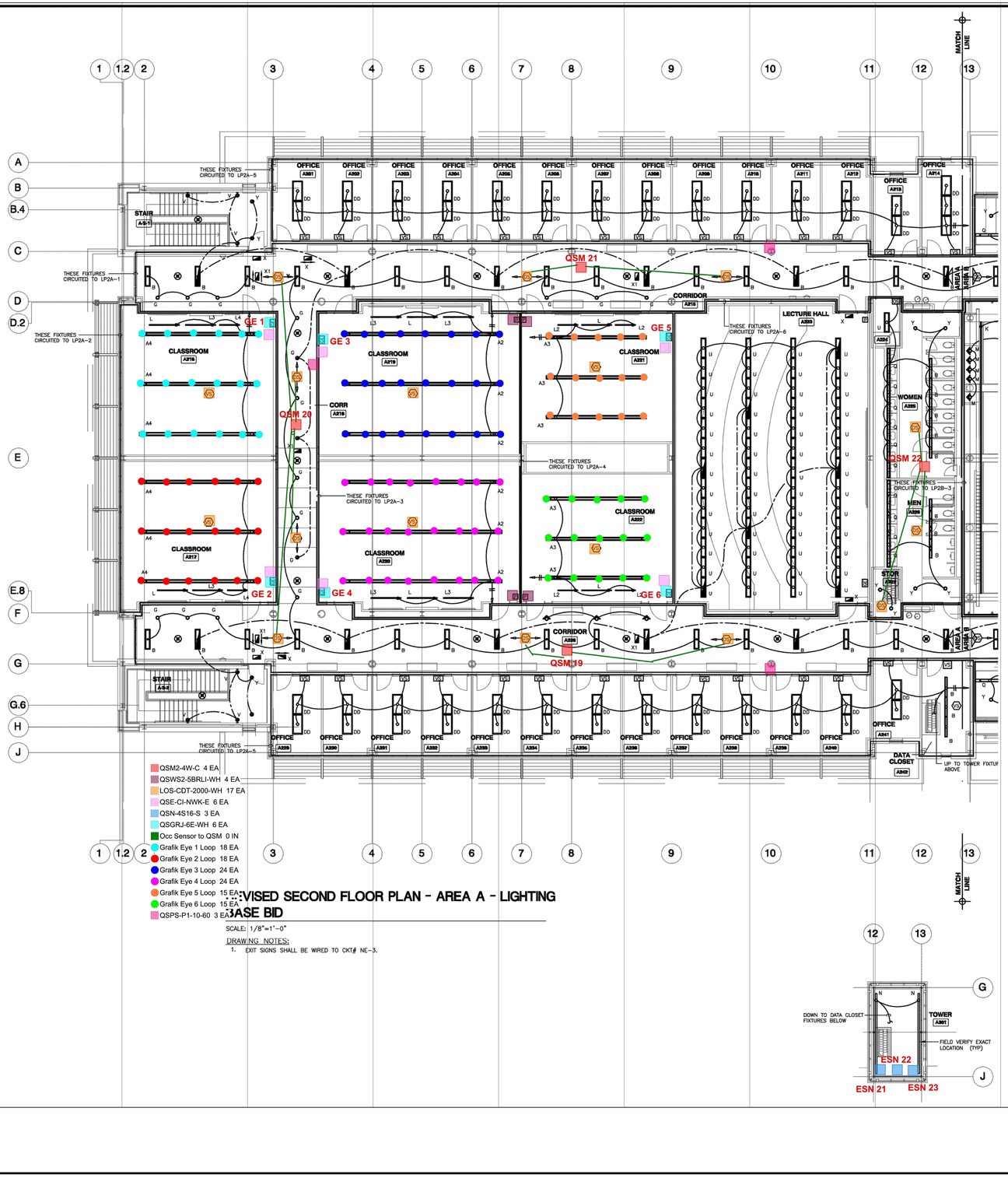

QSM2-4W-C 4 EA
QSWS2-5BRLI-WH 4 EA
LOS-CDT-2000-WH 17 EA
QSE-CI-NWK-E 6 EA
QSN-4S16-S 3 EA
QSGRJ-6E-WH 6 EA
Occ Sensor to QSM 0 IN
Grafik Eye 1 Loop 18 EA
Grafik Eye 2 Loop 18 EA
Grafik Eye 3 Loop 24 EA
Grafik Eye 4 Loop 24 EA
Grafik Eye 5 Loop 15 EA
Grafik Eye 6 Loop 15 EA
QSPS-P1-10-60 3 EA

REVISED SECOND FLOOR PLAN - AREA A - LIGHTING
BASE BID

SCALE: 1/8"=1'-0"

DRAWING NOTES:
1. EXIT SIGNS SHALL BE WIRED TO CKT# NE-3.

NOTE TO CONTRACTOR:
LUTRON WILL PROGRAM THE QUANTUM SYSTEM PER THESE LOOP LAYOUTS. IF THE SYSTEM CANNOT BE WIRED AS SHOWN, PLEASE CONTACT LUTRON.

ECOSYSTEM LOOP CONTROLS / MODULES

IMPORTANT NOTE REGARDING SENSOR PLACEMENT
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Drawing By:
Sheet No:
Dated:

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QUANTUM ECOSYSTEM LOOP LAYOUT

SECOND FLOOR - AREA A

Project Number:	186917
Drawn By:	KS/DAK
Drawing Revision:	1
Drawing Date:	09/14/2012
Sheet:	ELL3

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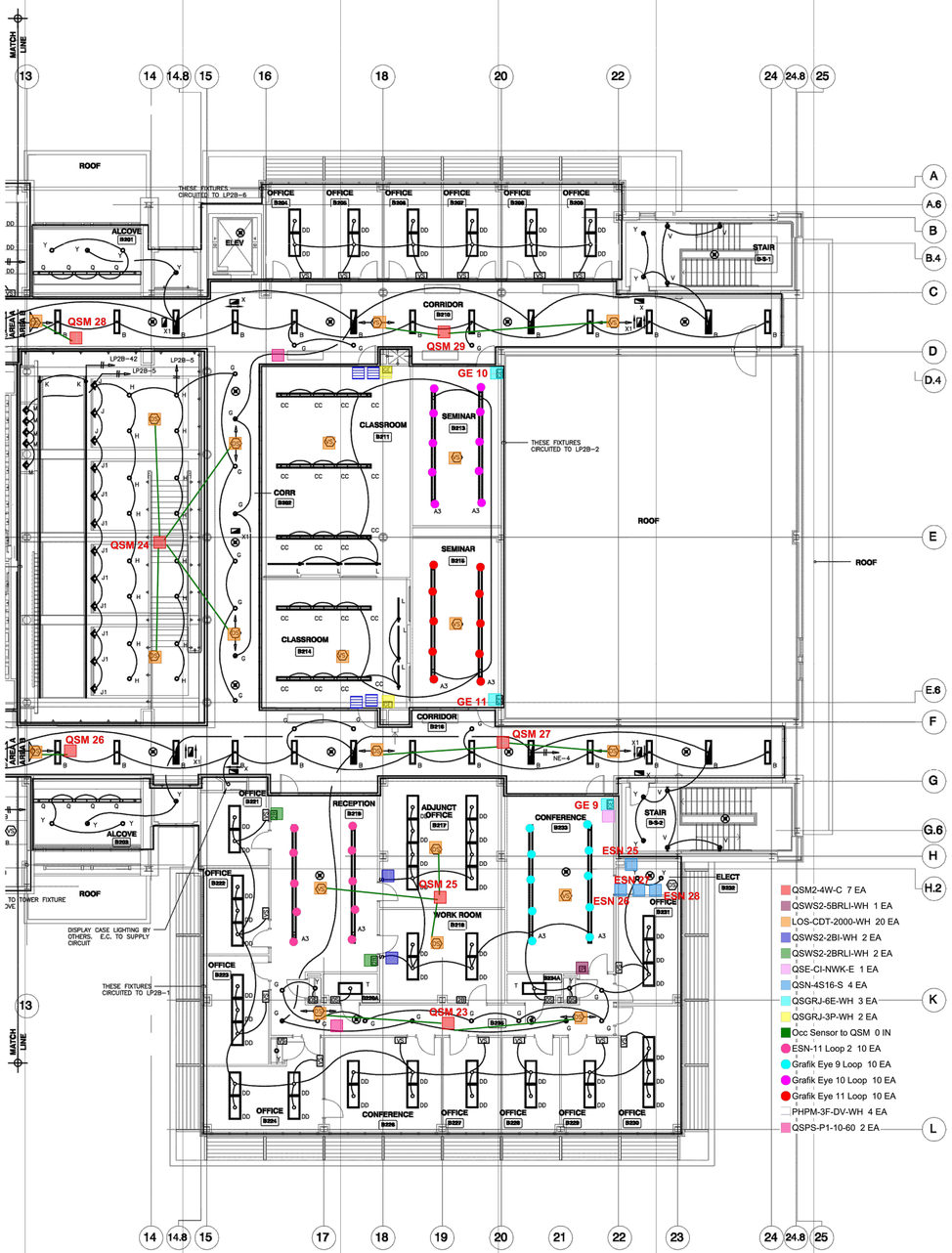
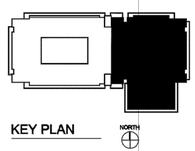


REVISED SECOND FLOOR PLAN - AREA B - LIGHTING BASE BID

SCALE: 1/8"=1'-0"

DRAWING NOTES:

1. EXIT SIGNS SHALL BE WIRED TO CKT# NE-3.



KEY PLAN

11/22/2011 8:10:45 AM

NOTE TO CONTRACTOR:
LUTRON WILL PROGRAM THE QUANTUM SYSTEM PER THESE LOOP LAYOUTS. IF THE SYSTEM CANNOT BE WIRED AS SHOWN, PLEASE CONTACT LUTRON.

ECOSYSTEM LOOP CONTROLS / MODULES

IMPORTANT NOTE REGARDING SENSOR PLACEMENT
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LUTRON LAYOUT IS BASED UPON:
Drawing By:
Sheet No:
Dated:

Drawing Not To Scale

DESALES UNIVERSITY - GAMBET CENTER

UPPER SAUCON, PA

QUANTUM ECOSYSTEM LOOP LAYOUT

SECOND FLOOR - AREA B

Project Number:	186917
Drawn By:	KS/DAK
Drawing Revision:	1
Drawing Date:	09/14/2012
Sheet:	ELL4

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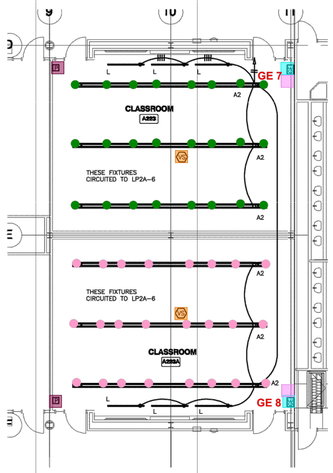
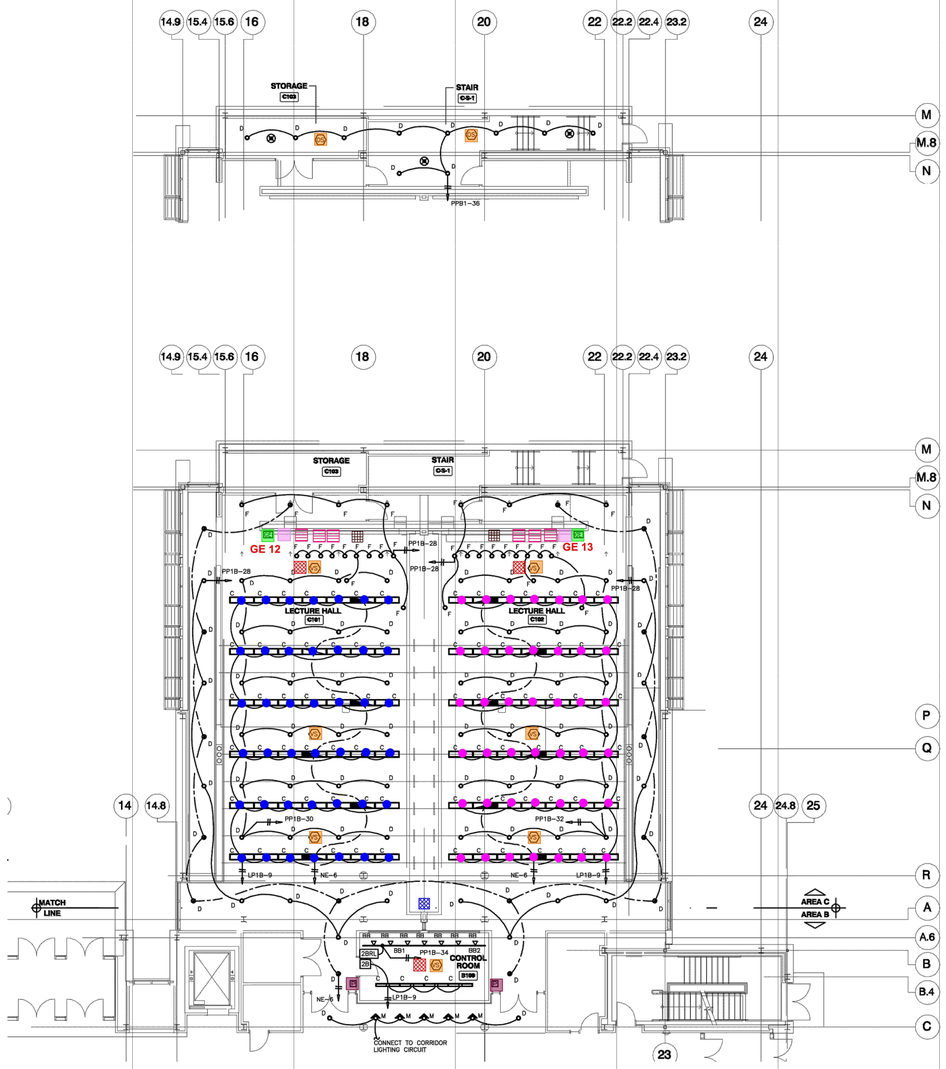


PARTIAL SECOND FLOOR PLAN - AREA A - LIGHTING ALTERNATE BID

SCALE: 1/8"=1'-0"

NOTES FOR ALTERNATE BID - LECTURE HALLS:

1. LECTURE HALLS C101 AND C102 ARE TO BE CONTROLLED BY A LUTRON GRAPHIC EYE SYSTEM. THEY ARE TO BE SEPARATELY CONTROLLED IF THE PARTITION IS CLOSED. IF IT IS OPEN, THEY ARE TO BE CONTROLLED FULLY BY EITHER PODIUM LOCATION.
2. THE GRAPHIC EYE SHALL CONTROL THE MECHO SHADES ON BOTH SIDES OF THE ROOMS.
3. THE DIMMING AND CONTROL CIRCUITS ARE AS FOLLOWS:
   - A. THE 'D' FIXTURES ABOVE THE RAMP - 120 VOLT
   - B. THE 'D' FIXTURES AT THE LOWER LOBBY - 120 VOLT
   - C. THE "F" FIXTURES AT THE UPPER END - 120 VOLT
   - D. THE 'D' FIXTURES AT THE MAIN SPACE - 120 VOLT
   - E. THE "C" FIXTURES IN THE MAIN SPACE - 120 VOLT
   - F. THE MECHO SHADES
4. EMERGENCY CIRCUITS ARE TO BE DIMMED AS WELL, USING A BODINE MODEL #GTD20A CONTROLLER.



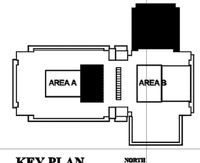
PARTIAL FIRST FLOOR PLAN - AREA C - LIGHTING ALTERNATE BID

SCALE: 1/8"=1'-0"

DRAWING NOTES:

1. E.C. SHALL PROVIDE (5) ADDITIONAL EXIT SIGNS TO BE ADDED TO PARTIAL FIRST FLOOR PLAN AREA C LIGHTING ALTERNATE BID. PLACEMENT SHALL BE DETERMINED AT A LATER DATE.
2. EXIT SIGNS SHALL BE WIRED TO CKT# NE-3.

- QSWS2-5BRLI-WH 4 EA
- LOS-CDT-2000-WH 11 EA
- QSE-CI-NWK-E 4 EA
- QSGRJ-6E-1WH 2 EA
- QSGRJ-6E-WH 2 EA
- Grafik Eye 7 Loop 24 EA
- Grafik Eye 8 Loop 24 EA
- PP-120H 3 EA
- Grafik Eye 12 Loop 42 EA
- Grafik Eye 13 Loop 42 EA
- PHPM-PA-DV-WH 6 EA
- QSE-IO/GRX-IRPS/12VDC 1 EA
- QSE-IO 2 EA



KEY PLAN
ALTERNATE BID

NORTH

9/21 8:28:09 AM

E105.pdf (100% of Scale); DeSales Univ - Gambet Center- Ext. Ltg Option; OnScreenDB_V1; 4/2/2012 08:58 AM

NOTE TO CONTRACTOR:
LUTRON WILL PROGRAM THE QUANTUM SYSTEM PER THESE LOOP LAYOUTS. IF THE SYSTEM CANNOT BE WIRED AS SHOWN, PLEASE CONTACT LUTRON.

ECOSYSTEM LOOP CONTROLS / MODULES

IMPORTANT NOTE REGARDING SENSOR PLACEMENT
THE OCCUPANCY SENSORS & DAYLIGHT SENSORS ON THIS ECOSYSTEM LOOP LAYOUT WERE NOT PLACED BY LUTRON. THIS ECOSYSTEM LOOP LAYOUT ONLY SHOWS THE CONNECTION OF THE SENSORS TO THE APPROPRIATE ECOSYSTEM COMPONENT. THE ACTUAL LOCATIONS OF THE SENSORS SHOULD BE DETERMINED BY FOLLOWING THE LUTRON SPECIFICATION SHEETS AND THE INSTALLATION INSTRUCTIONS.

THIS DRAWING IS NOT TO BE USED FOR GENERAL BUILDING WIRING PURPOSES. ITS INTENT IS TO DISPLAY THE QUANTUM SYSTEM COMPONENTS AND ECOSYSTEM PARTS ONLY. All EcoSystem ballast and modules should be wired to the loop that is shown. This is required for Lutron database programming purposes. Placement of the XPJ, BMJ and BMF modules are show for illustrative purposes only and can be placed anywhere within the rooms/loops.

LUTRON LAYOUT IS BASED UPON:
Drawing By:
Sheet No:
Dated:

Drawing Not To Scale

DESALES UNIVERSITY - GAMBET CENTER

UPPER SAUCON, PA

QUANTUM ECOSYSTEM LOOP LAYOUT

FIRST FLOOR - AREA C

Project Number:	186917
Drawn By:	KS/DAK
Drawing Revision:	1
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| Appendix G |

Luminaire Takeoff and Lighting Load Calculations

Luminaire Takeoff and Lighting Load Calculations

Fixture Type	Quantity	Input Watts	Total Watts	Total kWh/year	Percent Lit	kW Used	Percent Dimmed	kW Saved
Area 1A								
A	2	56	112	408.8	0.6	245.28	0.4	163.52
A-Added	63	56	3528	12877.2	0.6	7726.32	0.4	5150.88
A1	6	56	336	1226.4	0.75	919.8	0.25	306.6
A1-Added	3	56	168	613.2	0.75	459.9	0.25	153.3
B	18	28	504	1839.6	0.85	1563.66	0.15	275.94
B1	24	42	1008	3679.2	0.85	3127.32	0.15	551.88
G	7	26	182	664.3	1	664.3	0	0
M	12	20	240	876	1	876	0	0
Q	11	28	308	1124.2	0.85	955.57	0.15	168.63
T	97	64	6208	22659.2	0.85	19260.32	0.15	3398.88
U	2	64	128	467.2	1	467.2	0	0
V	6	35	210	766.5	1	766.5	0	0
X	7	2	14	51.1	1	51.1	0	0
X1	5	2	10	36.5	1	36.5	0	0
Y	4	62	248	905.2	1	905.2	0	0
Area 1B								
A	2	56	112	408.8	0.6	245.28	0.4	163.52
A-Added	20	56	1120	4088	0.6	2452.8	0.4	1635.2
A1	6	56	336	1226.4	0.75	919.8	0.25	306.6
A1-Added	6	56	336	1226.4	0.75	919.8	0.25	306.6
A5	10	224	2240	8176	0.75	6132	0.25	2044
AA	9	64	576	2102.4	1	2102.4	0	0
B	20	28	560	2044	0.85	1737.4	0.15	306.6
B1	6	42	252	919.8	0.85	781.83	0.15	137.97
P	26	35	910	3321.5	1	3321.5	0	0
R	8	37	296	1080.4	1	1080.4	0	0
T	45	64	2880	10512	0.85	8935.2	0.15	1576.8
V	6	35	210	766.5	1	766.5	0	0
X	9	2	18	65.7	1	65.7	0	0
X1	3	2	6	21.9	1	21.9	0	0
Y	8	62	496	1810.4	1	1810.4	0	0
Z	8	62	496	1810.4	1	1810.4	0	0
Area 2A								
A-Added	55	56	3080	11242	0.7	7869.4	0.3	3372.6
A1-Added	3	56	168	613.2	0.82	502.824	0.18	110.376
A2	6	448	2688	9811.2	0.82	8045.184	0.18	1766.016
A3	6	280	1680	6132	0.82	5028.24	0.18	1103.76
A4	6	336	2016	7358.4	0.82	6033.888	0.18	1324.512
B	18	28	504	1839.6	0.85	1563.66	0.15	275.94
B1	24	42	1008	3679.2	0.85	3127.32	0.15	551.88
G	17	26	442	1613.3	1	1613.3	0	0
K	1	275	275	1003.75	1	1003.75	0	0

L	12	42	504	1839.6	0.82	1508.472	0.18	331.128
L1	6	28	168	613.2	1	613.2	0	0
M	5	20	100	365	1	365	0	0
Q	10	28	280	1022	0.85	868.7	0.15	153.3
U	1	64	64	233.6	1	233.6	0	0
V	6	35	210	766.5	1	766.5	0	0
X	4	2	8	29.2	1	29.2	0	0
X1	4	2	8	29.2	1	29.2	0	0
Y	10	62	620	2263	1	2263	0	0
Area 2B								
A-Added	32	56	1792	6540.8	0.6	3924.48	0.4	2616.32
A1-Added	12	56	672	2452.8	0.75	1839.6	0.25	613.2
A3	6	280	1680	6132	0.75	4599	0.25	1533
A3-Added	2	280	560	2044	0.75	1533	0.25	511
A5-Added	2	224	448	1635.2	0.75	1226.4	0.25	408.8
B	16	28	448	1635.2	0.85	1389.92	0.15	245.28
B1	10	42	420	1533	0.85	1303.05	0.15	229.95
CC	20	66	1320	4818	0.75	3613.5	0.25	1204.5
G	22	26	572	2087.8	1	2087.8	0	0
H	16	35	560	2044	1	2044	0	0
J	3	39	117	427.05	1	427.05	0	0
J1	9	39	351	1281.15	1	1281.15	0	0
K	2	275	550	2007.5	1	2007.5	0	0
L	3	42	126	459.9	0.75	344.925	0.25	114.975
Q	8	28	224	817.6	1	817.6	0	0
T	2	64	128	467.2	0.75	350.4	0.25	116.8
V	6	35	210	766.5	1	766.5	0	0
X	4	2	8	29.2	1	29.2	0	0
X1	5	2	10	36.5	1	36.5	0	0
Y	16	62	992	3620.8	1	3620.8	0	0
Lecture Hall/Classroom (Alternate Bid)								
A2	5	448	2240	8176	0.75	6132	0.25	2044
B1	7	42	294	1073.1	1	1073.1	0	0
C	88	42	3696	13490.4	0.75	10117.8	0.25	3372.6
D	86	37	3182	11614.3	0.75	8710.725	0.25	2903.575
F	16	37	592	2160.8	0.75	1620.6	0.25	540.2
L	6	42	252	919.8	1	919.8	0	0
			59315	**216499.75**		**174,409.12**		**42,090.63**