Student Life Center

- introduction
- lighting depth
  - weight training & cardio
  - running track
- electrical depth
- façade breadth
- mechanical breadth

Student Life Center

Final Design | 04.14.2014

Jay Kline | Lighting + Electrical

Student Life Center

introduction

lighting depth

- weight training & cardio
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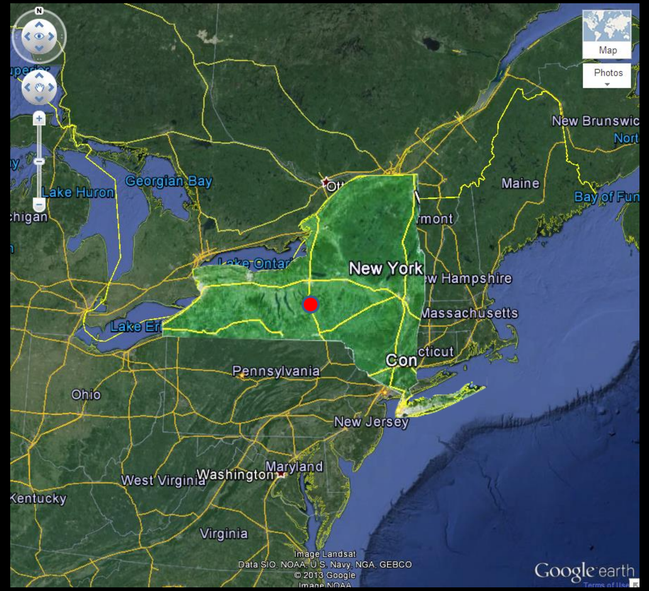
electrical depth

façade breadth

mechanical breadth



Student Life Center

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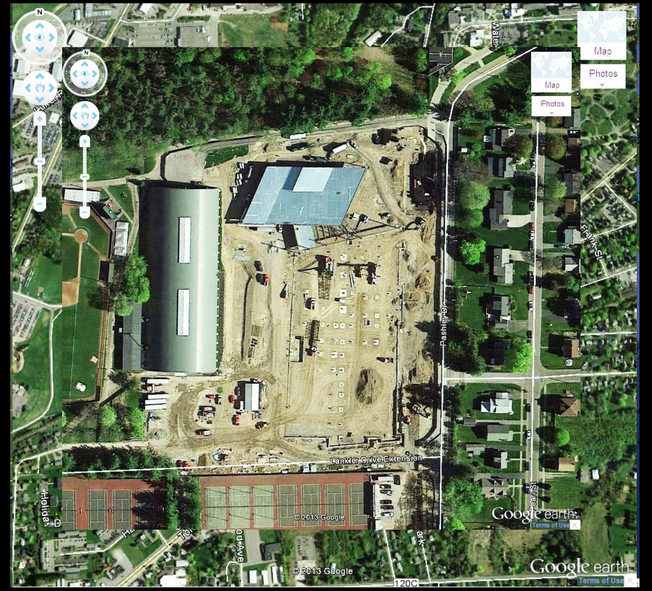

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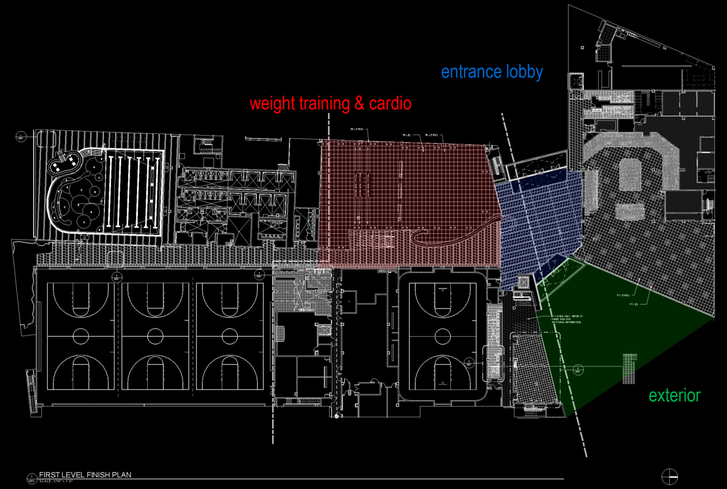

Student Life Center

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Student Life Center

introduction

lighting depth — design concept

- weight training & cardio
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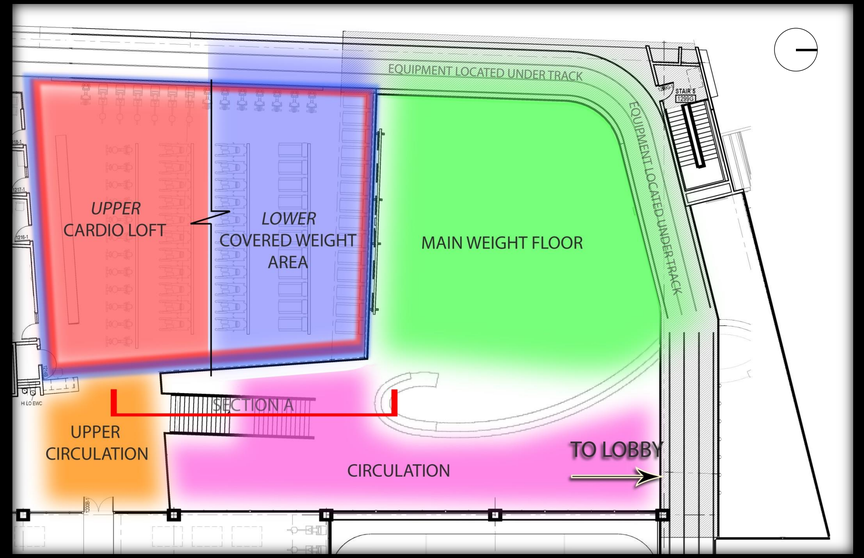
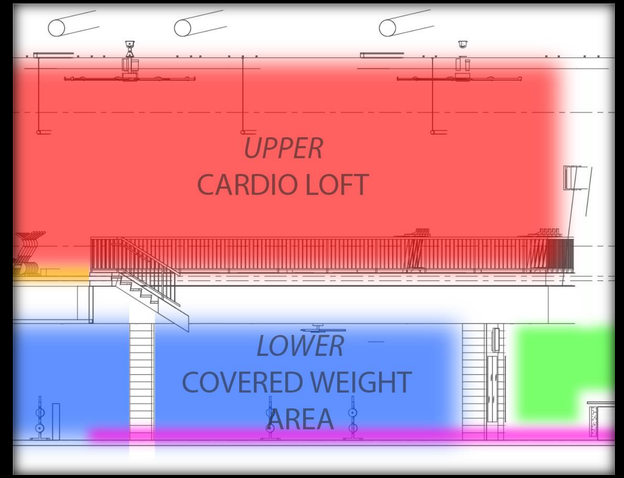
MOTION LIFE

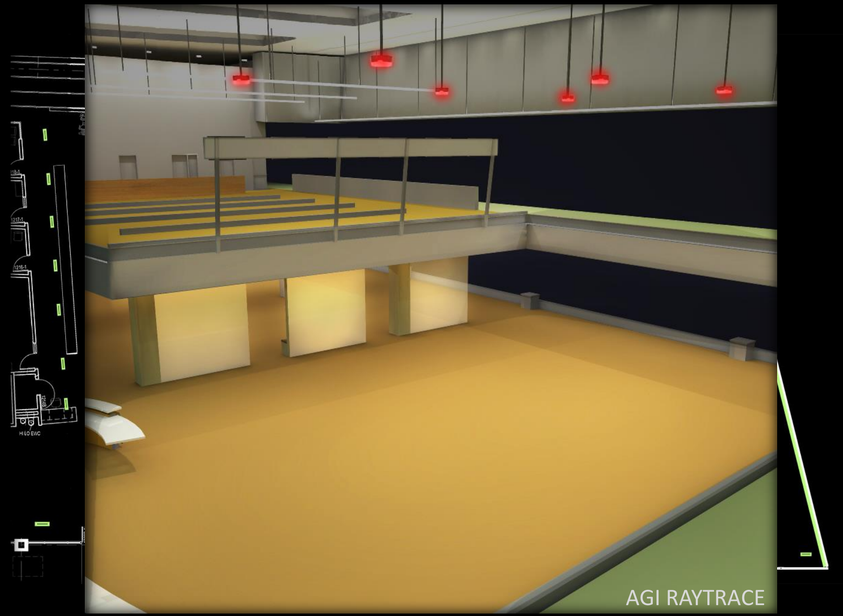
Student Life Center

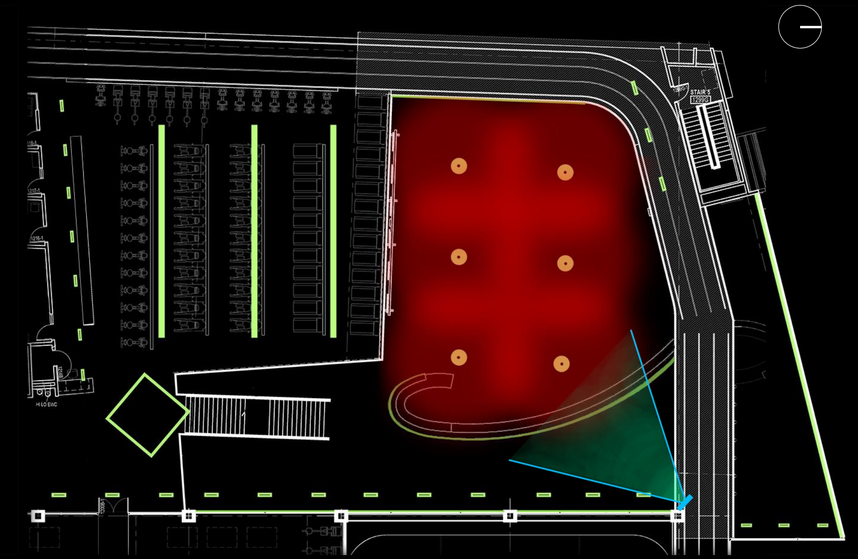




SECTION A

Student Life Center





Student Life Center

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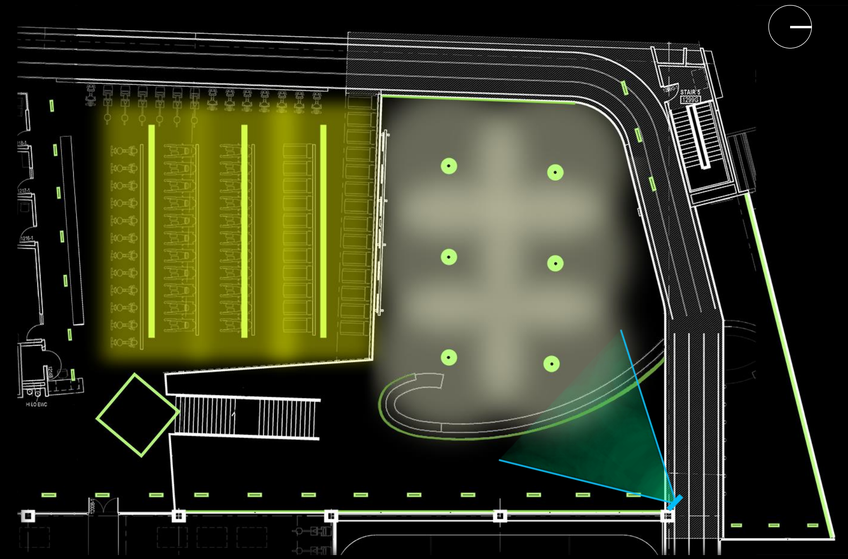

Student Life Center

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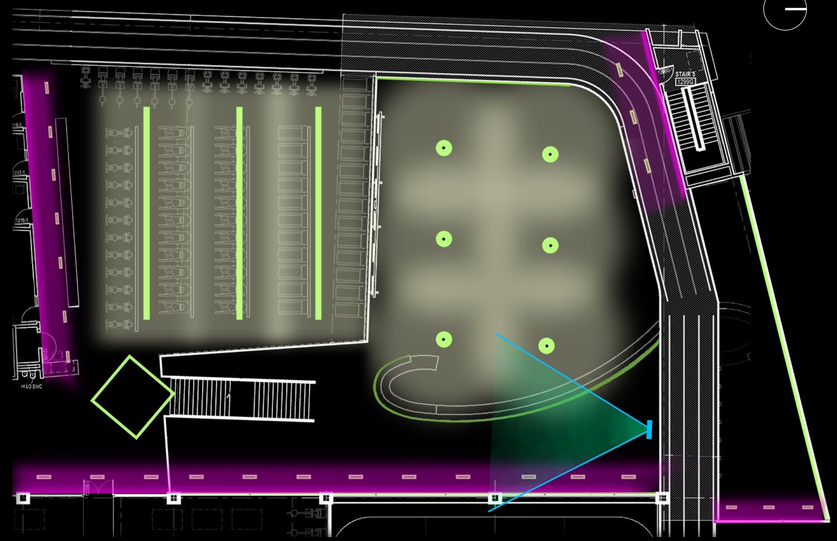

Student Life Center

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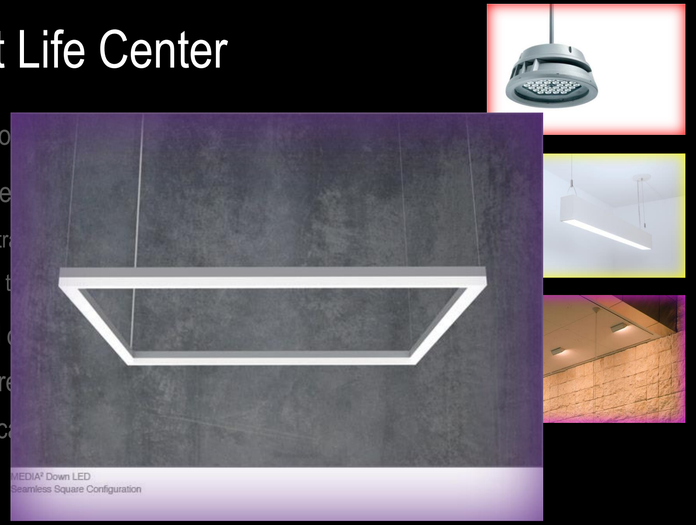

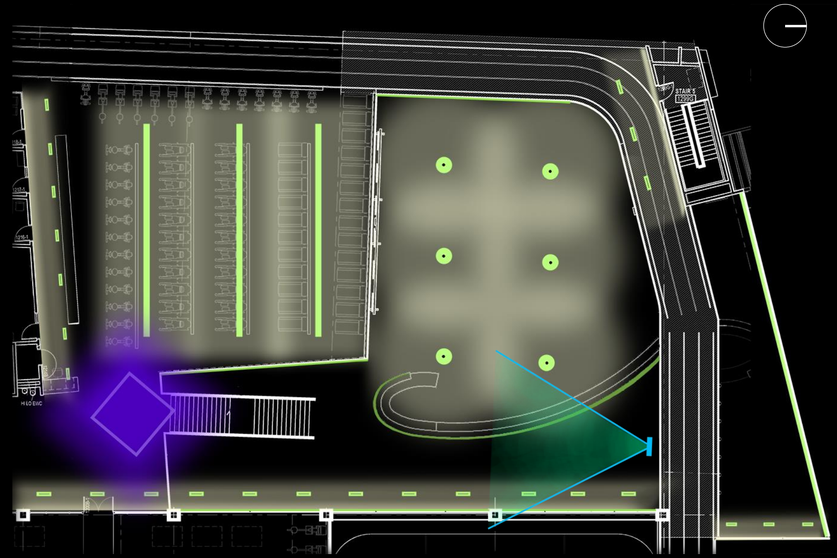

Student Life Center

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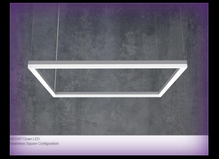

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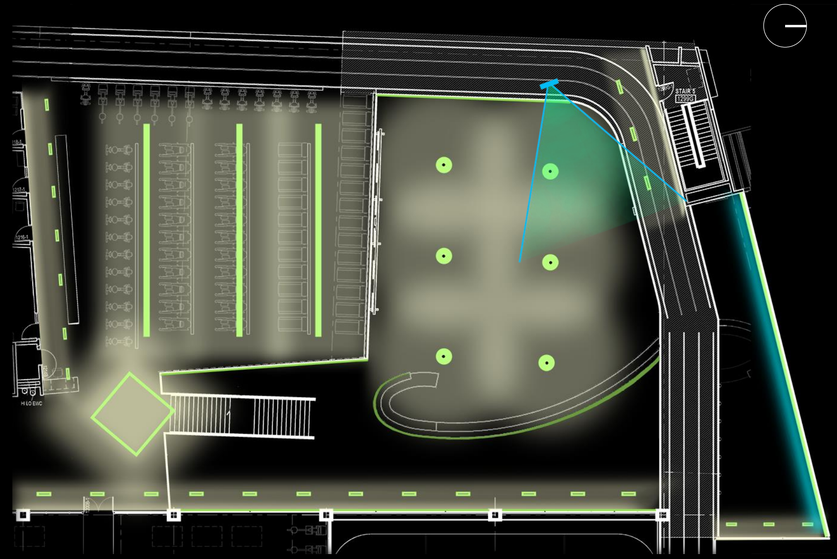
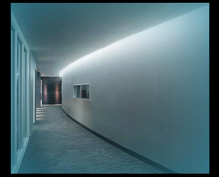
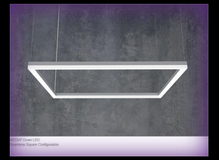


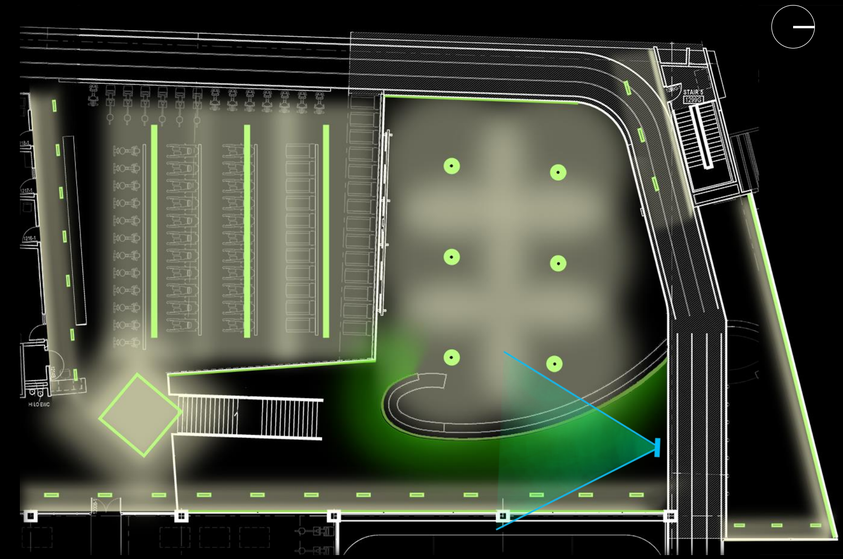
Student Life Center

introduction

lighting depth



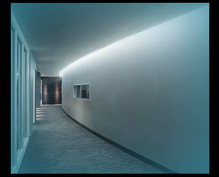


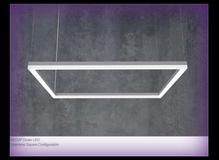


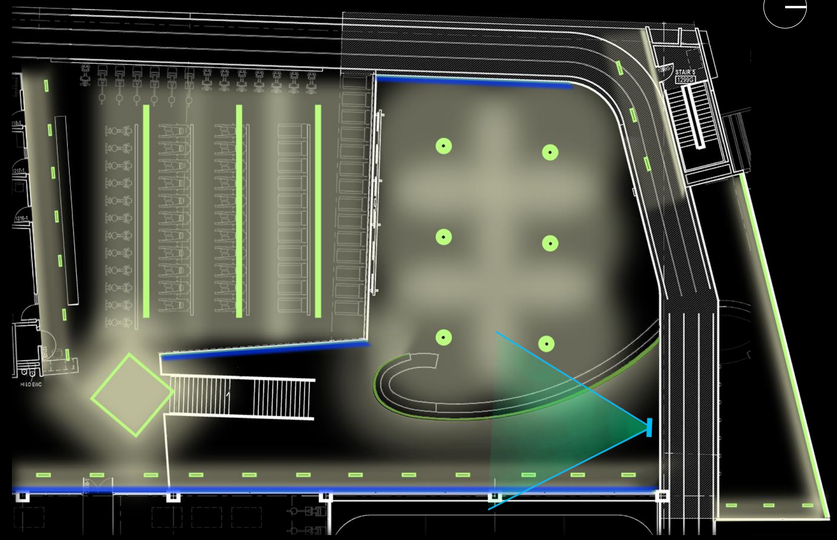
Student Life Center

introduction

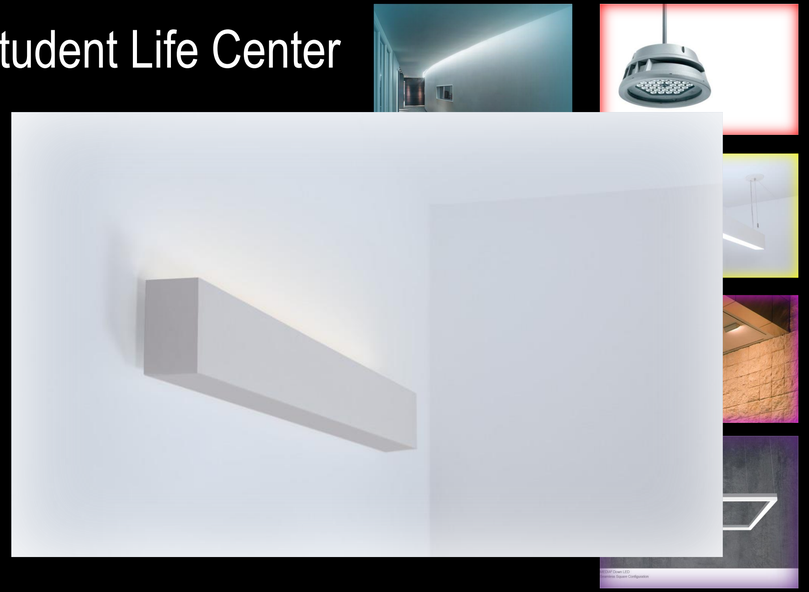
lighting depth







Student Life Center



Student Life Center

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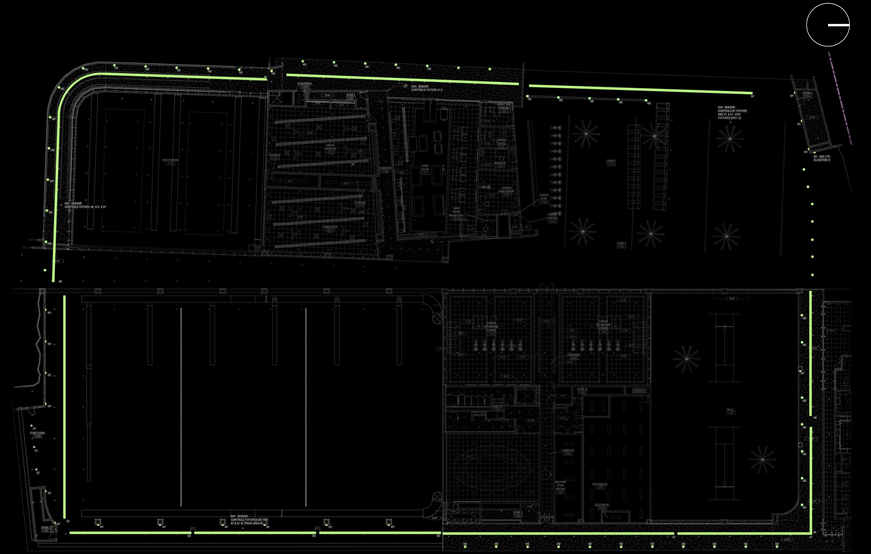
electrical depth

façade breadth

mechanical breadth



Student Life Center

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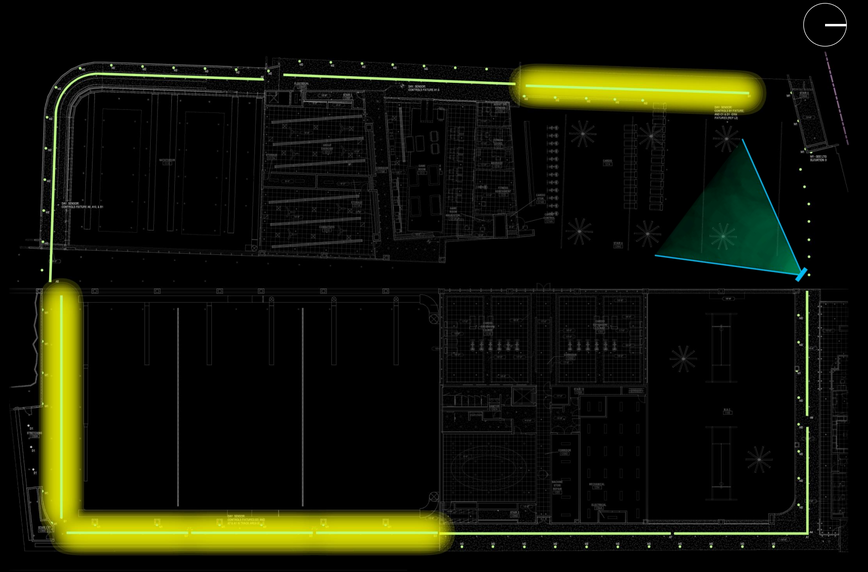

Student Life Center

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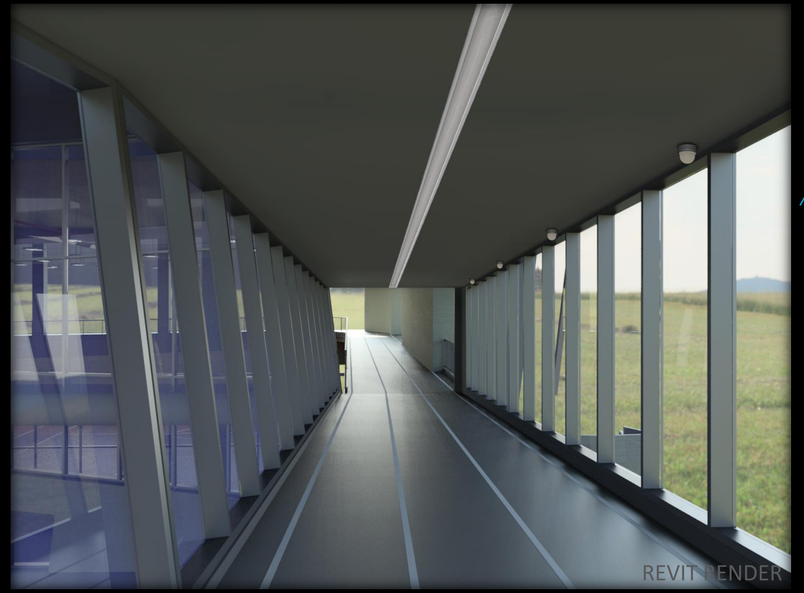

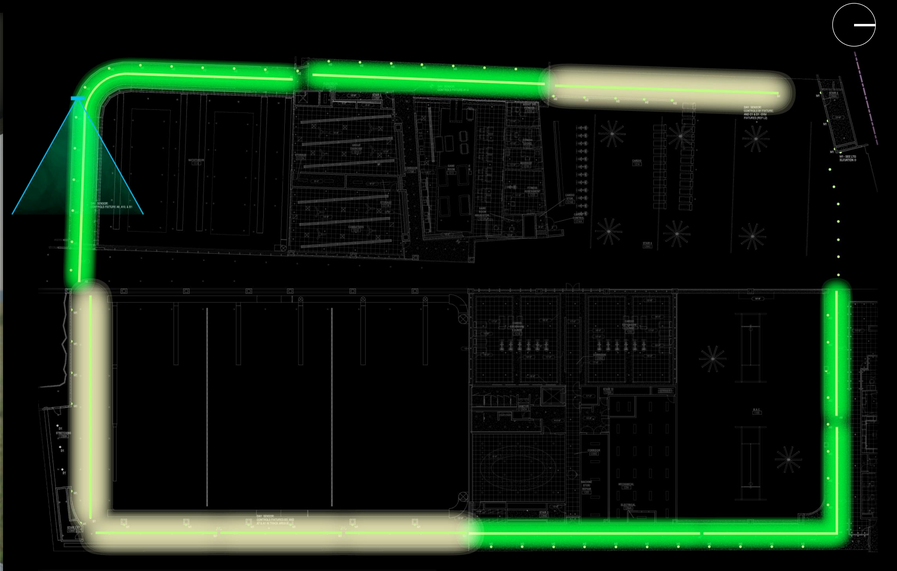

Student Life Center

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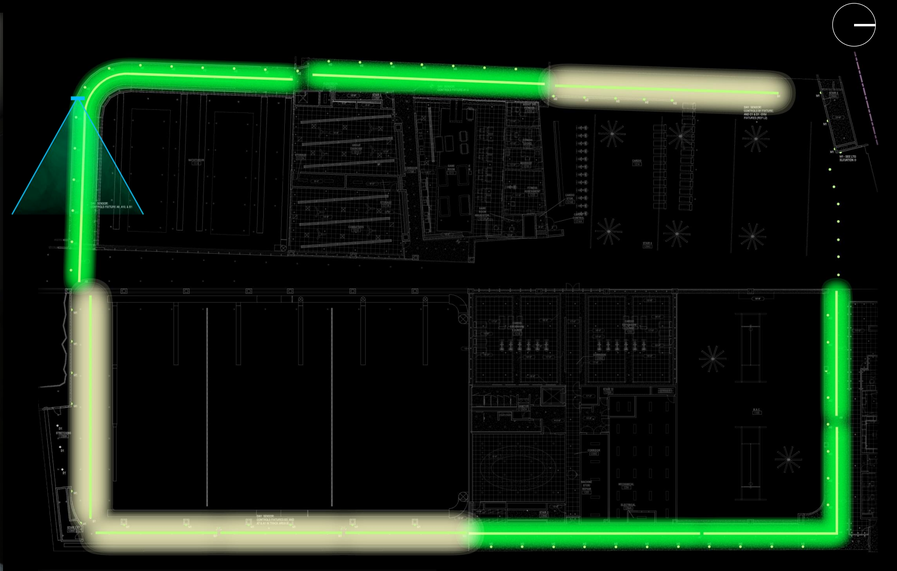
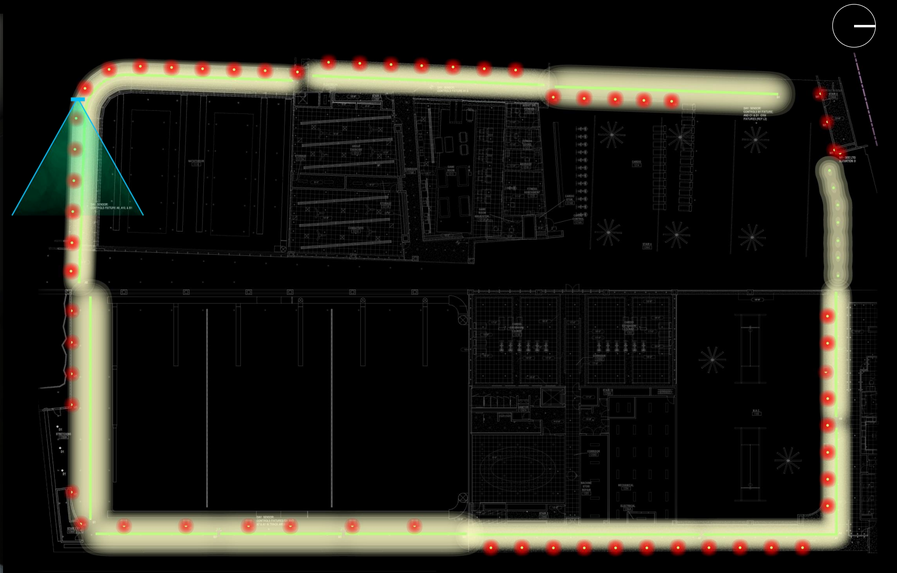


Student Life Center

introduction

lighting depth



Student Life Center

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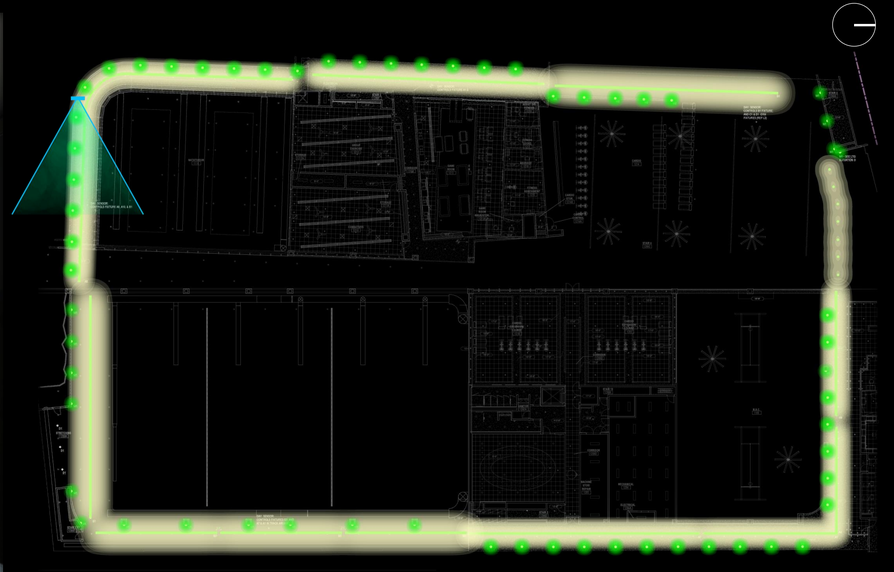
façade breadth

mechanical breadth



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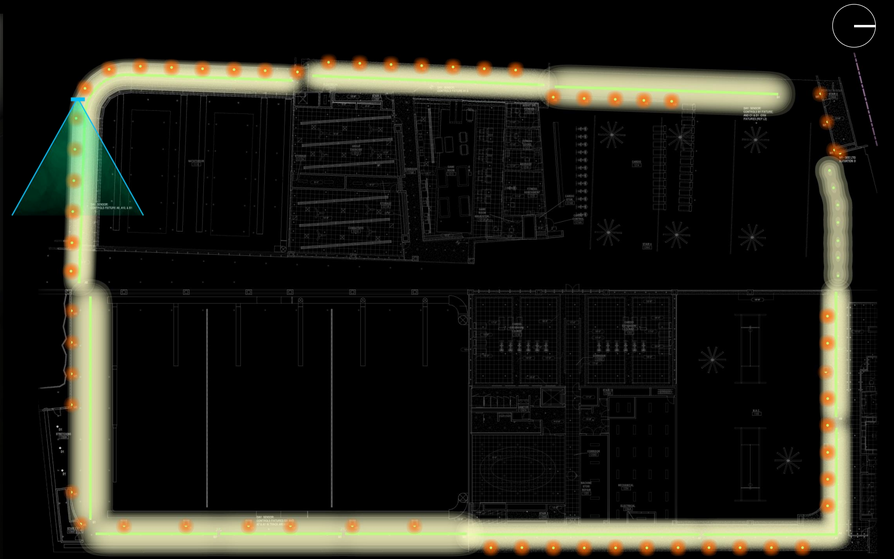

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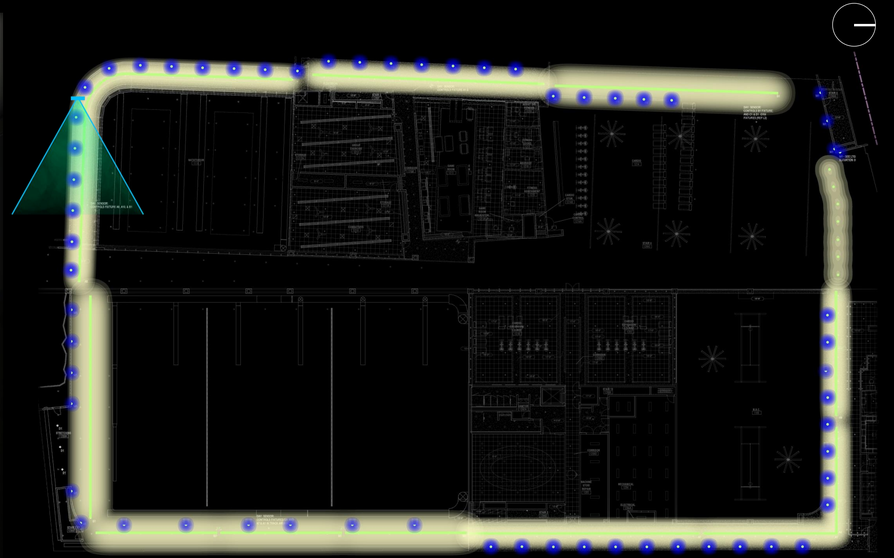
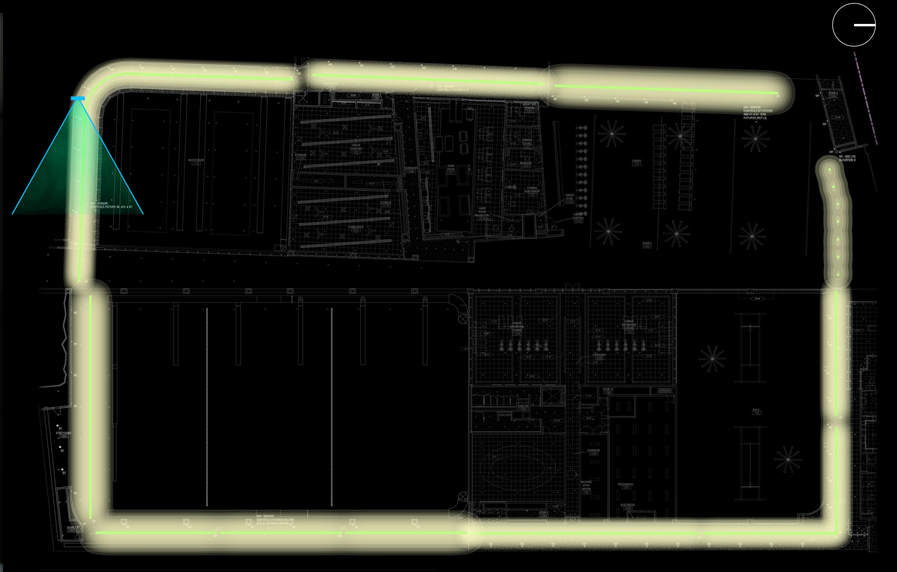


Student Life Center



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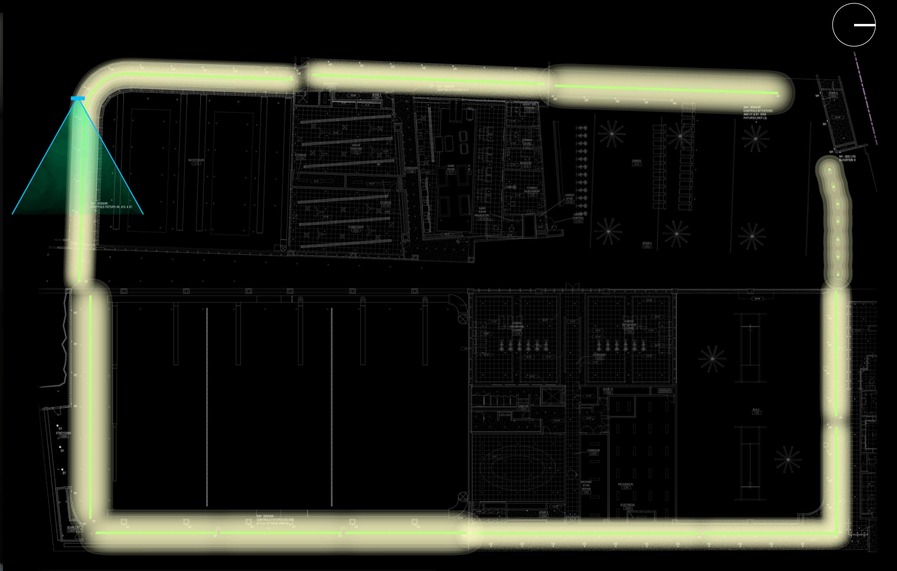

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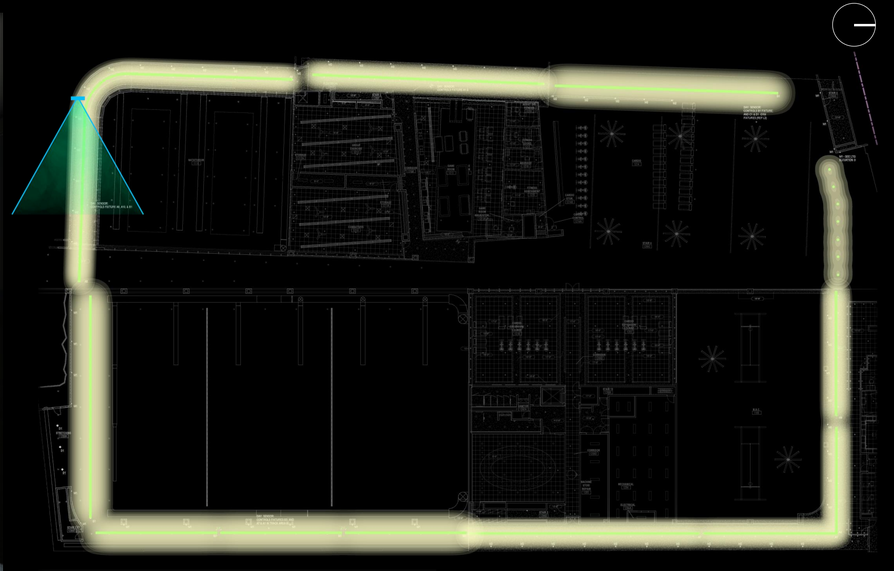

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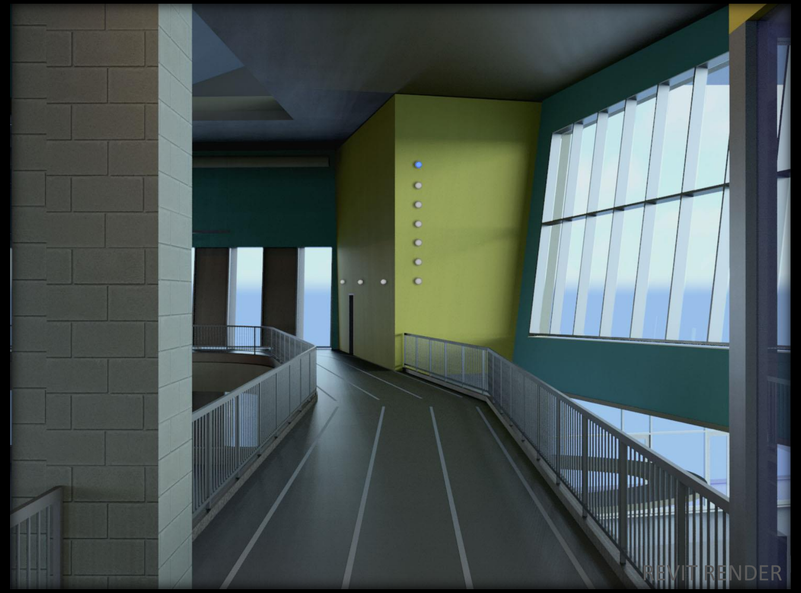

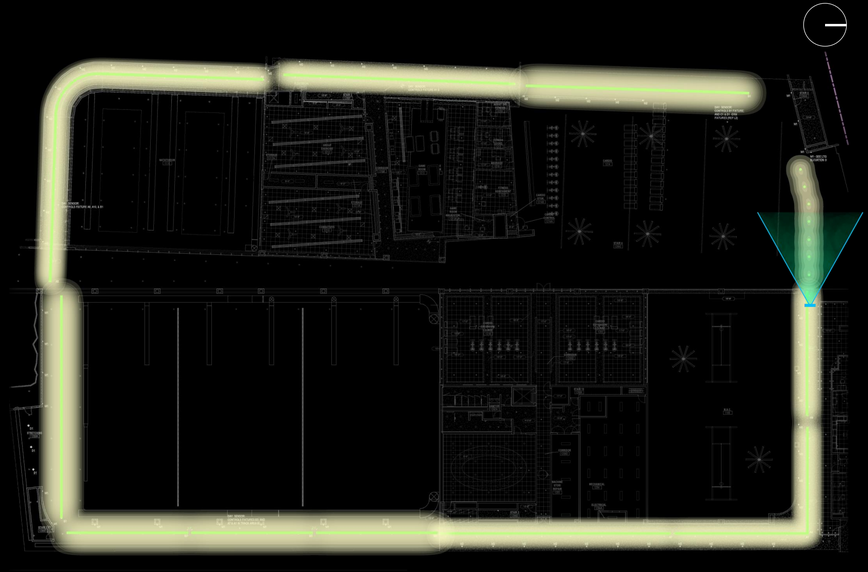

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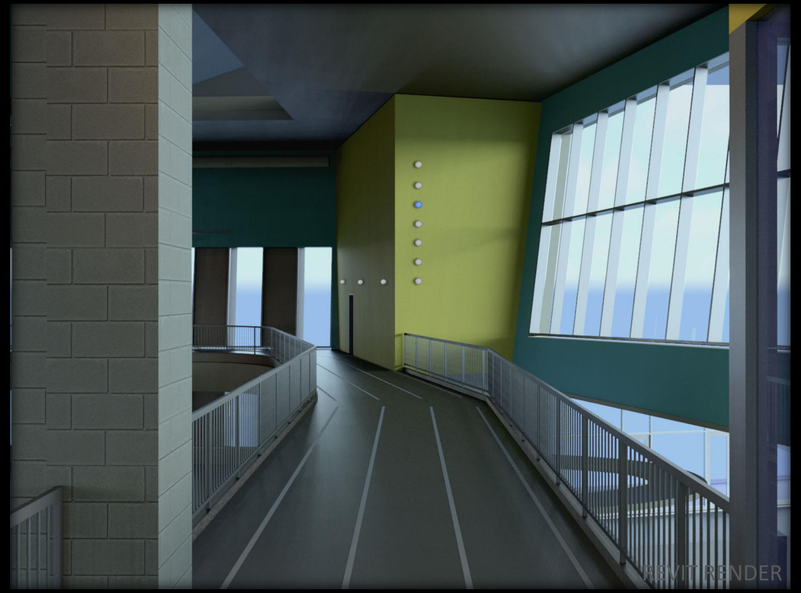

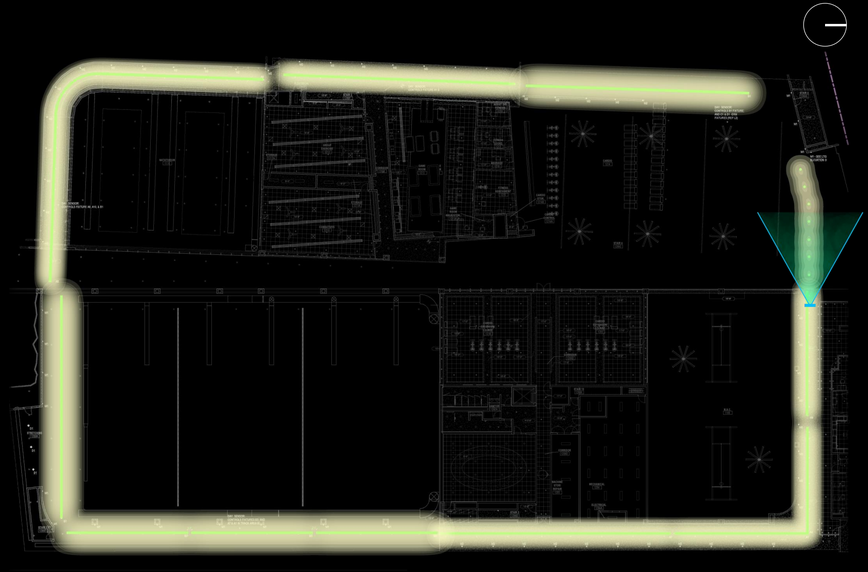

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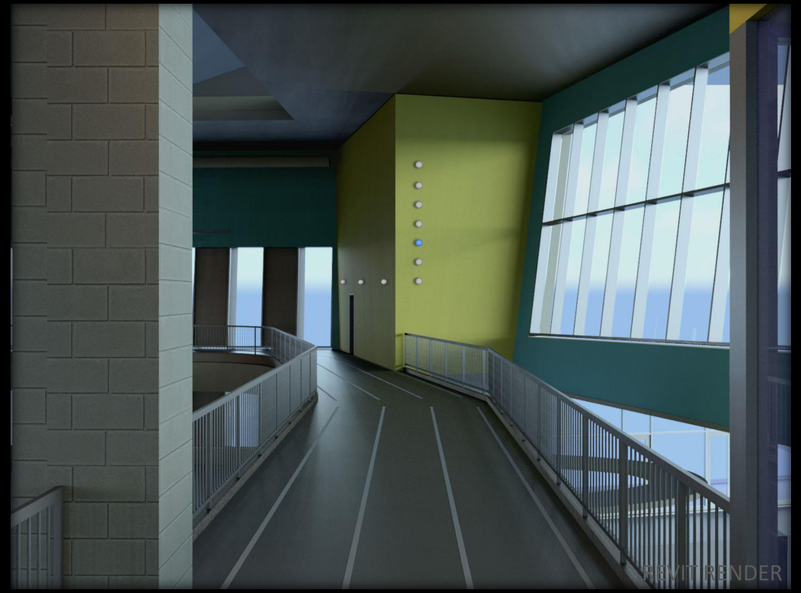

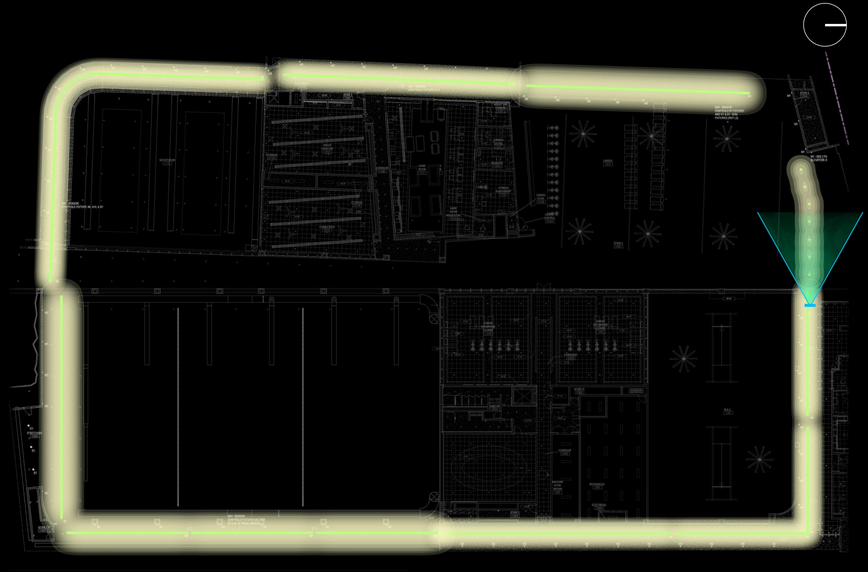

Student Life Center

introduction

lighting depth

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- running track

electrical depth

façade breadth

mechanical breadth

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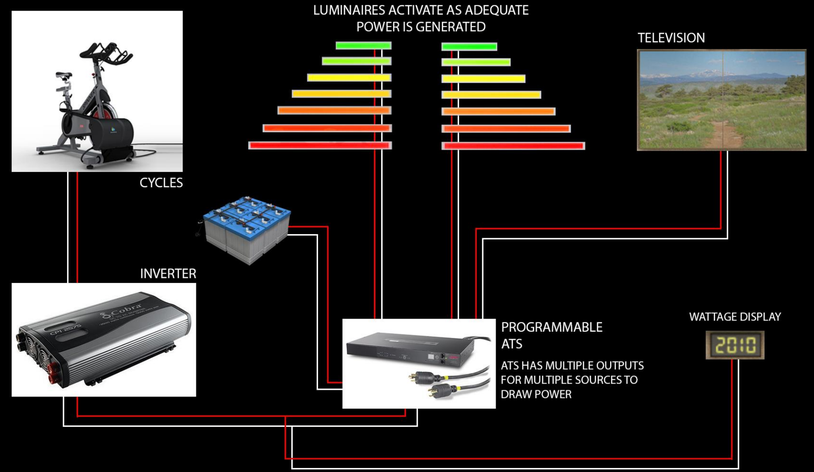

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Penn State White Building

40,000 students

4 spinning classes/day

SUNY, Cortland

7,330 students

1 spinning class/day → 25 bike capacity (assume 20 typical)

Energia FITNESS

Class of 20

2200W per class

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40 ft Lighting

240 W – 1 hour

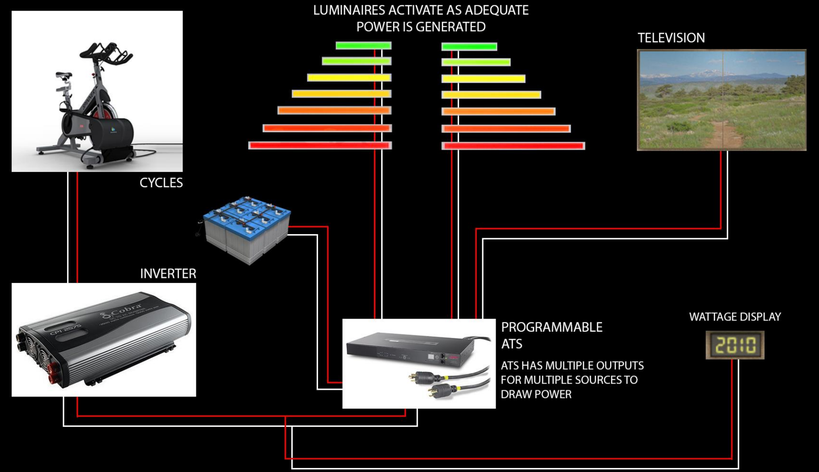
Television

260 W – 1 hour

1700 W

Battery Bank Capacity

5000 W



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Rain Screen Façade

Comparisons between:

- Typical Façade Types
- Non Pressure Equalized Rain Screen
- Pressure Equalized Rain Screen

Relevant Comparisons Categories

1. Water Management
2. Thermal Efficiency
3. Weight – Structural Reasons
4. Constructability & Cost

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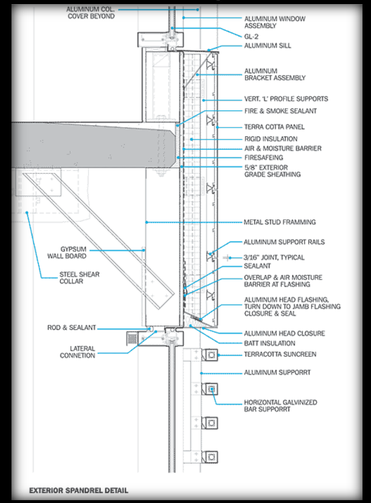
Rain Screen Façade



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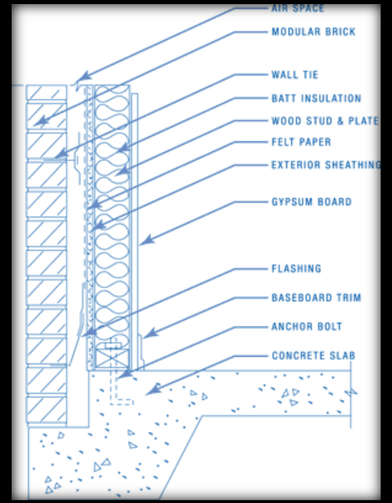
Brick on Metal Stud



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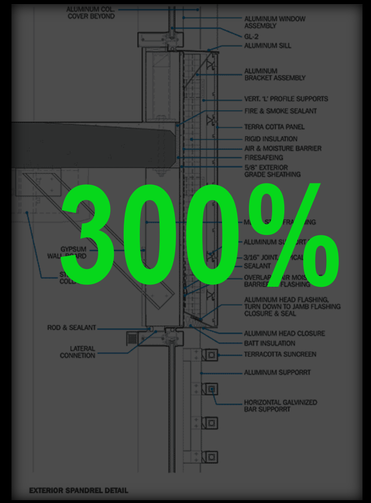

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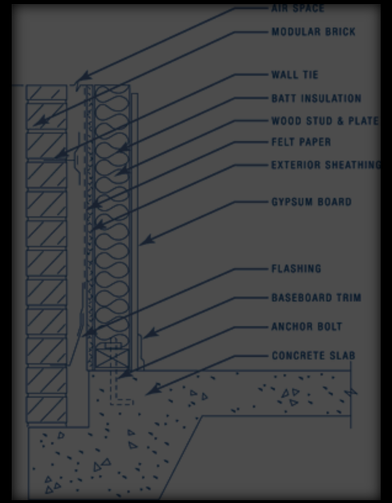

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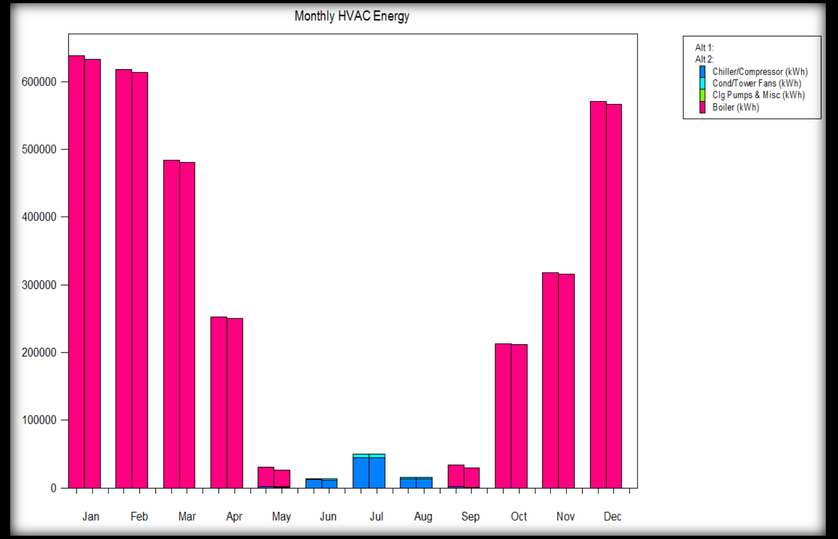
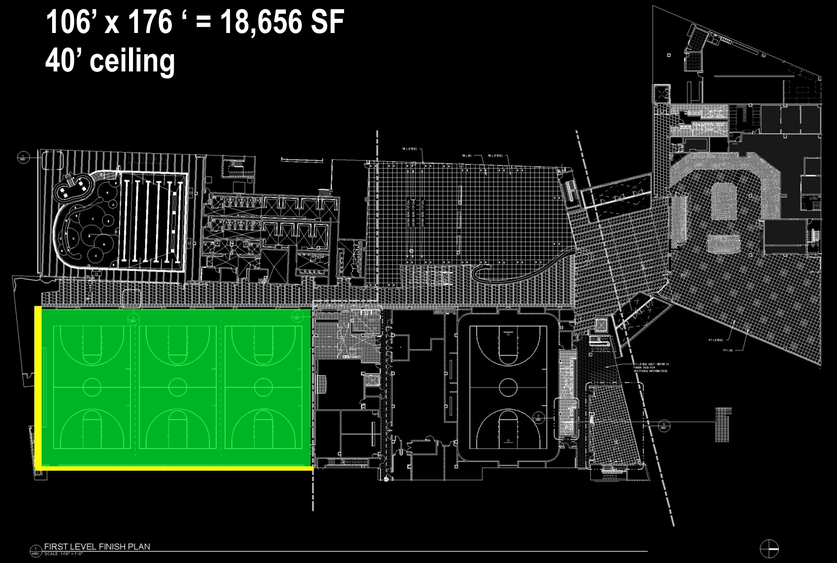


106’ x 176 ‘ = 18,656 SF
40’ ceiling



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Rain Screen Façade

ENERGY CONSUMPTION SUMMARY
By ACADEMIC

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
Alternative 2					
Primary heating					
Primary heating		10,662,873	92.3 %	10,662,873	11,224,077
Other Htg Accessories	29,755		0.9 %	101,552	304,688
Heating Subtotal	**29,755**	**10,662,873**	**93.2 %**	**10,764,425**	**11,528,765**
Primary cooling					
Cooling Compressor	72,293		2.1 %	248,738	740,287
Tower/Cond Fans	8,886		0.3 %	30,328	90,993
Condenser Pump			0.0 %	0	0
Other Clg Accessories	141		0.0 %	482	1,447
Cooling Subtotal....	**81,321**		**2.4 %**	**277,548**	**832,727**
Auxiliary					
Supply Fans			0.0 %	0	0
Pumps			0.0 %	0	0
Stand-alone Base Utilities			0.0 %	0	0
Aux Subtotal....			0.0 %	0	0
Lighting					
Lighting	148,755		4.4 %	507,702	1,523,258
Receptacle					
Receptacles			0.0 %	0	0
Cogeneration					
Cogeneration			0.0 %	0	0
Totals					
Totals**	**259,831**	**10,662,873**	**100.0 %**	**11,549,675**	**13,884,749**

* Note: Resource Utilization factors are included in the Total Source Energy value.
** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

Project Name:
Dataset Name: Thesis.trc

TRACE® 700 v6.3 calculated at 09:17 PM on 04/04/2014
Alternative - 2 Energy Consumption Summary report page 1

Brick on Metal Stud

ENERGY CONSUMPTION SUMMARY
By ACADEMIC

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
Alternative 1					
Primary heating					
Primary heating		10,774,589	92.3 %	10,774,589	11,341,673
Other Htg Accessories	30,093		0.9 %	102,708	308,155
Heating Subtotal	**30,093**	**10,774,589**	**93.2 %**	**10,877,297**	**11,649,828**
Primary cooling					
Cooling Compressor	74,236		2.2 %	253,369	760,183
Tower/Cond Fans	9,179		0.3 %	31,327	93,989
Condenser Pump			0.0 %	0	0
Other Clg Accessories	144		0.0 %	493	1,479
Cooling Subtotal....	**83,560**		**2.4 %**	**285,189**	**855,651**
Auxiliary					
Supply Fans			0.0 %	0	0
Pumps			0.0 %	0	0
Stand-alone Base Utilities			0.0 %	0	0
Aux Subtotal....			0.0 %	0	0
Lighting					
Lighting	148,755		4.4 %	507,702	1,523,258
Receptacle					
Receptacles			0.0 %	0	0
Cogeneration					
Cogeneration			0.0 %	0	0
Totals					
Totals**	**262,408**	**10,774,589**	**100.0 %**	**11,670,187**	**14,028,737**

* Note: Resource Utilization factors are included in the Total Source Energy value.
** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

Project Name:
Dataset Name: Thesis.trc

TRACE® 700 v6.3 calculated at 09:17 PM on 04/04/2014
Alternative - 1 Energy Consumption Summary report page 1

Student Life Center

- introduction
- lighting depth
  - weight training & cardio
  - running track
- electrical depth
- façade breadth
- mechanical breadth

Rain Screen Façade

ENERGY CONSUMPTION SUMMARY
By ACADEMIC

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
Alternative 2					
Primary heating					
Primary heating		10,662,873	92.3 %	10,662,873	11,224,077
Other Htg Accessories	29,755		0.9 %	101,552	304,688
Heating Subtotal	**29,755**	**10,662,873**	**93.2 %**	**10,764,425**	**11,528,765**
Primary cooling					
Cooling Compressor	72,293		2.1 %	246,738	740,287
Tower/Cond Fans	8,886		0.3 %	30,328	90,993
Condenser Pump			0.0 %	0	0
Other Clg Accessories	141		0.0 %	492	1,447
Cooling Subtotal....	**81,321**		**2.4 %**	**277,548**	**832,727**
Auxiliary					
Supply Fans			0.0 %	0	0
Pumps			0.0 %	0	0
Stand-alone Base Utilities			0.0 %	0	0
Aux Subtotal....			0.0 %	0	0
Lighting					
Lighting	148,755		4.4 %	507,702	1,523,258
Receptacle					
Receptacles			0.0 %	0	0
Cogeneration					
Cogeneration			0.0 %	0	0
Totals					
Totals**	259,831	10,662,873	100.0 %	11,549,675	13,884,749

1%

* Note: Resource Utilization factors are included in the Total Source Energy value.
** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

Project Name:
Dataset Name: Thesis.trc

TRACE® 700 v6.3 calculated at 09:17 PM on 04/04/2014
Alternative - 2 Energy Consumption Summary report page 1

Brick on Metal Stud

ENERGY CONSUMPTION SUMMARY
By ACADEMIC

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
Alternative 1					
Primary heating					
Primary heating		10,774,589	92.3 %	10,774,589	11,341,673
Other Htg Accessories	30,093		0.9 %	102,708	308,155
Heating Subtotal	**30,093**	**10,774,589**	**93.2 %**	**10,877,297**	**11,649,828**
Primary cooling					
Cooling Compressor	74,236		2.2 %	253,369	760,183
Tower/Cond Fans	9,179		0.3 %	31,327	93,989
Condenser Pump			0.0 %	0	0
Other Clg Accessories	144		0.0 %	493	1,479
Cooling Subtotal....	**83,560**		**2.4 %**	**285,189**	**855,651**
Auxiliary					
Supply Fans			0.0 %	0	0
Pumps			0.0 %	0	0
Stand-alone Base Utilities			0.0 %	0	0
Aux Subtotal....			0.0 %	0	0
Lighting					
Lighting	148,755		4.4 %	507,702	1,523,258
Receptacle					
Receptacles			0.0 %	0	0
Cogeneration					
Cogeneration			0.0 %	0	0
Totals					
Totals**	262,408	10,774,589	100.0 %	11,670,187	14,028,737

* Note: Resource Utilization factors are included in the Total Source Energy value.
** Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

Project Name:
Dataset Name: Thesis.trc

TRACE® 700 v6.3 calculated at 09:17 PM on 04/04/2014
Alternative - 1 Energy Consumption Summary report page 1

Acknowledgements

Dr. Kevin Houser

Dr. Richard Mistrick

Leslie Beam

Prof. M. Kevin Parfitt

Drew Jones

Greg Campbell

Family…

Student Life Center

Final Design | 4.14.2014

Jay Kline | Lighting + Electrical

Image References

[1] https://www.google.com/maps
[2] http://newlifenewbeginnings.proboards.com/
[3] http://www.lumenpulse.com

Student Life Center

intro

light

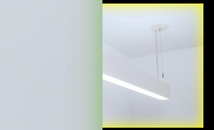
w

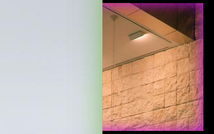
ru

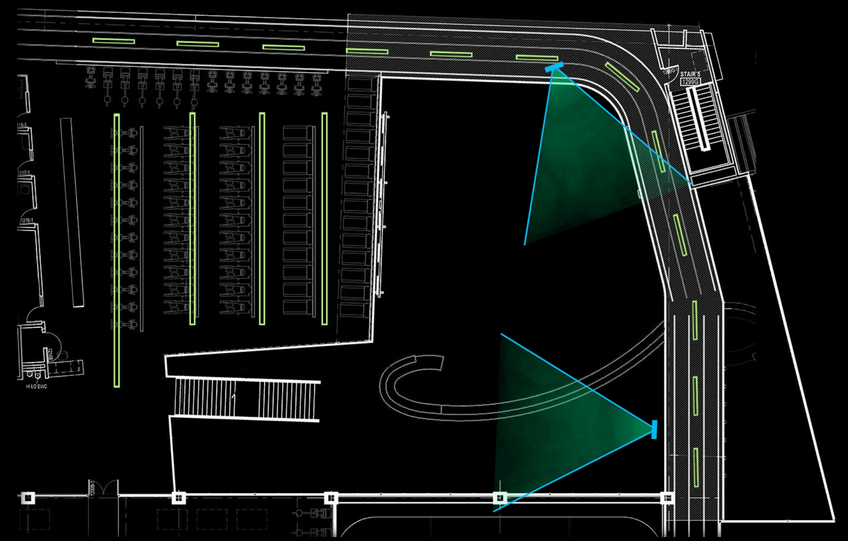
elec

faça

mec







Student Life Center

introduction

lighting depth

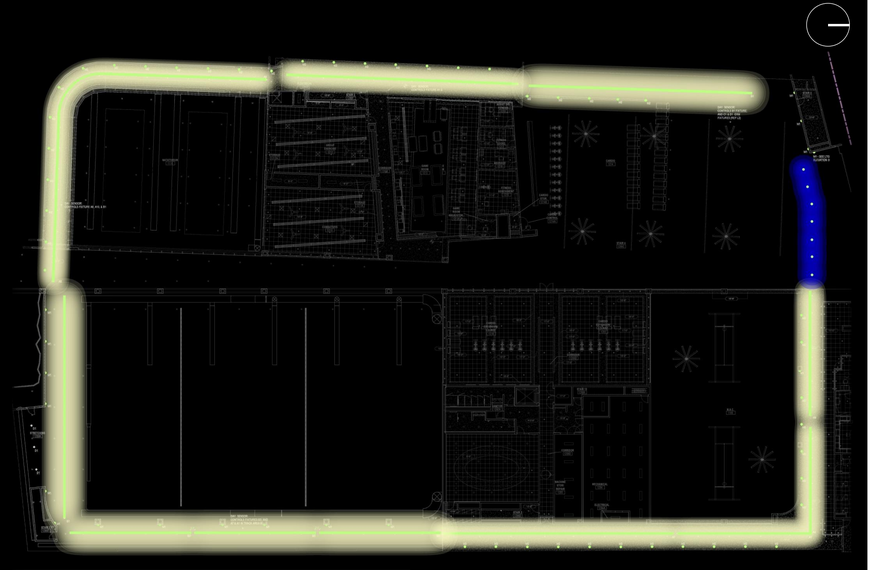
weight training & cardio

running track

elec

faça

mec



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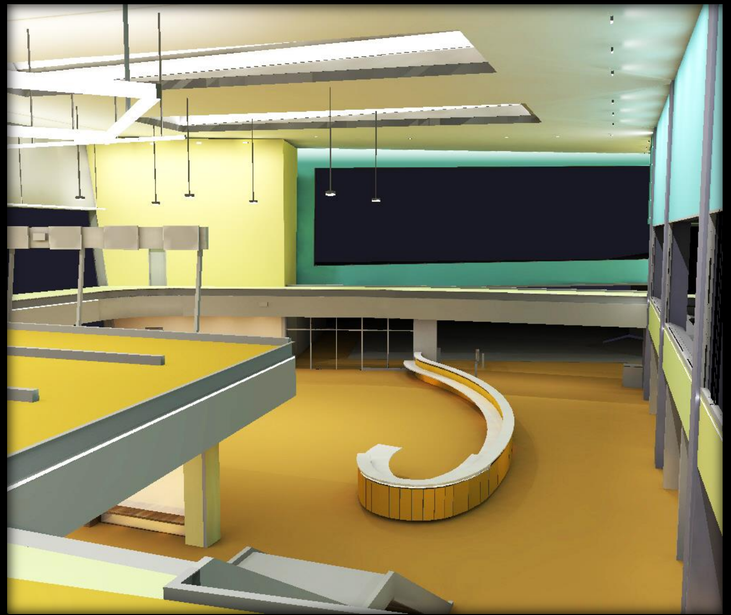
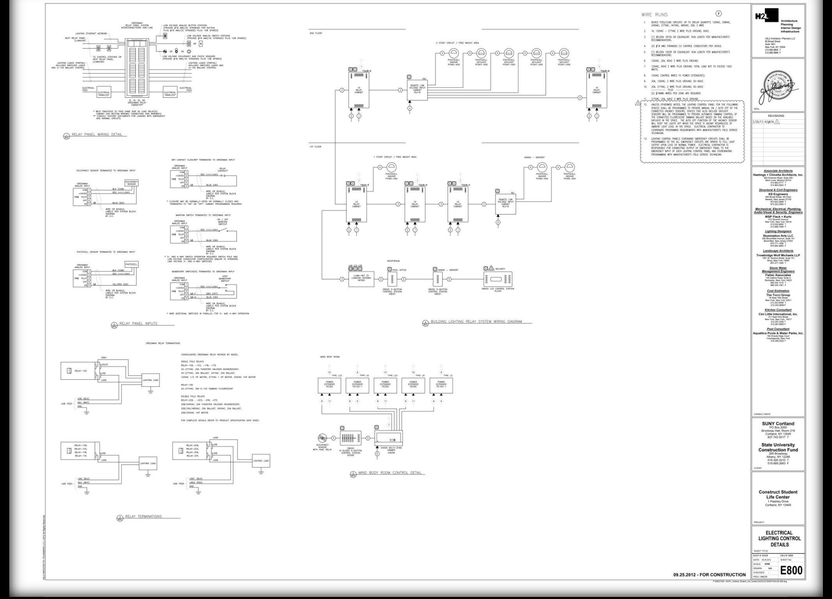
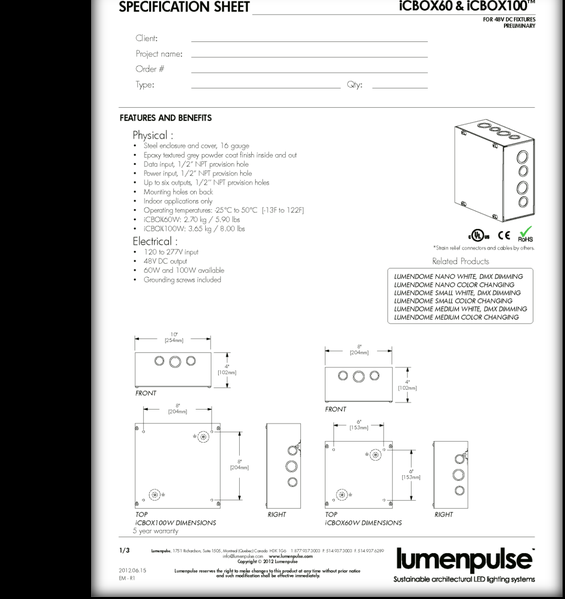


Controls References





Fixture Schedule

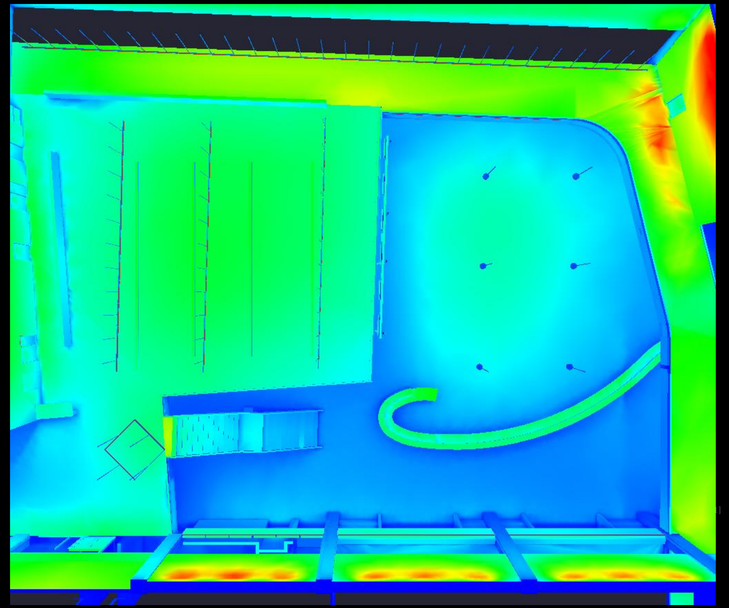
SUNY Cortland Lighting Fixture Schedule

Symbol	Type	Manufacturer	Name	Product No.	Lamp Type	CRI	CCT	Lamp Life (hrs.)	Mounting	Volt	Lum or Lum/ft	W or W/Ft	Lum/W	Description
See Lighting Plans	A1	Lumenpulse	Lumenline Rec	LLI2R-227-C60-dRO40K-DMX1FX-FGL-WH	LED	86	4000k	100000	Recessed-Ceiling	277	367.5	7	52.50	Acrylic lens, Continuous Run, Direct
	A2	Lumenpulse	Lumenline Rec	LLI2R-227-C64-dRO40K-DMX1FX-FGL-WH	LED	85	4000k	100000	Recessed-Ceiling	277	367.5	7	52.50	Acrylic lens, Continuous Run, Direct
	A3	Lumenpulse	Lumenline Rec	LLI2R-227-C21-dRO40K-DMX1FX-FGL-WH	LED	87	4000k	100000	Recessed-Ceiling	277	367.5	7	52.50	Acrylic lens, Continuous Run, Direct, Radial to Match Desk Overhang
	A4	Lumenpulse	Lumenline Rec	LLI2R-227-C48-dRO40K-DMX1FX-FGL-WH	LED	87	4000k	100000	Recessed-Ceiling	277	367.5	7	52.50	Acrylic lens, Continuous Run, Direct
	A5	Lumenpulse	Lumenline Rec	LLI2R-227-C68-dRO40K-DMX1FX-FGL-WH	LED	87	4000k	100000	Recessed-Ceiling	277	367.5	7	52.50	Acrylic lens, Continuous Run, Direct
	A6	Lumenpulse	Lumenline Rec	LLI2R-227-4-dRO40K-DMX1FX-FGL-WH	LED	87	4000k	100000	Recessed-Ceiling	277	367.5	7	52.50	Acrylic lens, LED Direct
	A7	Lumenpulse	Lumenline Rec	LLI2R-227-C104-dRO40K-DMX1FX-FGL-WH	LED	87	4000k	100000	Recessed-Ceiling	277	367.5	7	52.50	Acrylic lens, Continuous Run, Direct
	A8	Lumenpulse	Lumenline Rec	LLI2R-227-C72-dRO40K-DMX1FX-FGL-WH	LED	87	4000k	100000	Recessed-Ceiling	277	367.5	7	52.50	Acrylic lens, Continuous Run, Direct
	A9	Lumenpulse	Lumenline Rec	LLI2R-227-C56-dRO40K-DMX1FX-FGL-WH	LED	87	4000k	100000	Recessed-Ceiling	277	367.5	7	52.50	Acrylic lens, Continuous Run, Direct
	A10	Lumenpulse	Lumenline Rec	LLI2R-227-C30-dRO40K-DMX1FX-FGL-WH-SPECIAL	LED	87	4000k	100000	Recessed-Ceiling	277	367.5	7	52.50	Acrylic lens, Continuous Run, Direct, Radial to Match Curvutare of Track
	B1	Lumenpulse	Lumenline Pend	LLI2P-DI-227-C100-dRO40K-iRO40K-DMX1FX-ACC50-WH	LED	88	4000k	100000	Pendant	277	824.75	14	58.91	Acrylic lens, Continuous Run, Direct/Indirect
	B2	Lumenpulse	Lumenline Pend	LLI2P-DI-227-C44-dRO40K-iRO40K-DMX1FX-ACC50-WH	LED	88	4000k	100000	Pendant	277	824.75	14	58.91	Acrylic lens, Continuous Run, Direct/Indirect
	B3	Lumenpulse	Lumenline Pend	LLI2P-DI-227-C54-dRO40K-iRO40K-DMX1FX-ACC50-WH	LED	88	4000k	100000	Pendant	277	824.75	14	58.91	Acrylic lens, Continuous Run, Direct/Indirect
	C1	Lumenpulse	Lumenbeam Grande	LBG-227-40k-WFL-blank-WH-DMX1BD	LED	81	4000k	100000	Pendant	227	4922	99	49.72	LED pendant, direct
	D1	Gotham	Incito	ICO-40-20-6AR-blank-20-277-DMXR	LED	85	4000k	50000	Recessed-Ceiling	227	2000	28	71.43	Recessed Downlight
	E1	Lighting Quotient	Elliptipar Wall Washer	M205-150G-T-02-2-00-0	Metal Halide - CDM150/T6/942	96	4200k	12000	Semi-Recessed-Ceiling	227	12700	150	84.67	Metal Halide semi-recessed wall washer, Ballast: shown in Appendix C
	F1	LED Linear	VarioLED Flex Venus	VarioLED Flex VENUS W835/W30 TV IP67	LED	85	4100k	50000	Recessed-Wall	24	110	3	36.67	LED Continuous Flexible Strip
	F2	LED Linear	VarioLED Flex Venus	VarioLED Flex VENUS W835/W22 TV IP67	LED	85	4100k	50000	Recessed-Wall	24	110	3	36.67	LED Continuous Flexible Strip
	F3	LED Linear	VarioLED Flex Venus	VarioLED Flex VENUS W835/W18 TV IP67	LED	85	4100k	50000	Recessed-Wall	24	110	3	36.67	LED Continuous Flexible Strip
	F4	LED Linear	VarioLED Flex Venus	VarioLED Flex VENUS W835/W87 TV IP67	LED	85	4100k	50000	Recessed-Wall	24	110	3	36.67	LED Continuous Flexible Strip
	F5	LED Linear	VarioLED Flex Venus	VarioLED Flex VENUS W835/W38 TV IP67	LED	85	4100k	50000	Recessed-Wall	24	110	3	36.67	LED Continuous Flexible Strip
	F6	LED Linear	VarioLED Flex Venus	VarioLED Flex VENUS W835/W31 TV IP67	LED	85	4100k	50000	Recessed-Wall	24	110	3	36.67	LED Continuous Flexible Strip
	F7	LED Linear	VarioLED Flex Venus	VarioLED Flex VENUS W835/W41 TV IP67	LED	85	4100k	50000	Recessed-Wall	24	110	3	36.67	LED Continuous Flexible Strip
	F8	LED Linear	VarioLED Flex Venus	VarioLED Flex VENUS W835/W28 TV IP67	LED	85	4100k	50000	Recessed-Wall	24	110	3	36.67	LED Continuous Flexible Strip
	F9	LED Linear	VarioLED Flex Venus	VarioLED Flex VENUS W835/W10 TV IP67	LED	85	4100k	50000	Recessed-Wall	24	110	3	36.67	LED Continuous Flexible Strip
	G1	Lumenpulse	Lumencove	LCSRO-227-C11-40K-CL-RF-WH-DMX1FX	LED	85	4000k	100000	Cove	227	1383 (total)	25 (total)	55.00	LED Continuous Cove Light
	G2	Lumenpulse	Lumencove	LCSRO-227-C12-40K-CL-RF-WH-DMX1FX	LED	85	4000k	100000	Cove	227	1383 (total)	25 (total)	55.00	LED Continuous Cove Light
	G3	Lumenpulse	Lumencove	LCSRO-227-C72-40K-CL-RF-WH-DMX1FX	LED	85	4000k	100000	Cove	227	1383 (total)	25 (total)	55.00	LED Continuous Cove Light
	H	Lumascape	Omnio Mini	LS411LED-15W4-ME-C-09-CB	LED		4300k	Unavailable	Clamped	120	743	16	46.44	LED directional, mounted to branches for path lighting using
	I	Lumenpulse	Lumenline Wall	LLI2S-WM-I-227-C60-iRO40K-DMX1FX-WH	LED	86	4000k	100000	Wall Mount	277	367.5	7	52.50	Acrylic lens, Continuous Run, Indirect
	J	Bega	Landscape Bollard	8657LED-120-BLK	LED	85	4000k	Unavailable	Bollard	120	729	13	56.08	IP67 Bollard, Black Finish, 21 inches Tall
	K	Delray	Media Square	M2LD-8x8-LOCW-BDMXMOD	LED	>80	4000k	Unavailable	Bollard	227	1168	24	48.67	Square LED Pendant, Aluminum Matte Anodized Finish
	L	LED Linear	VarioLED Flex Venus	VarioLED Flex VENUS W835/W51 TV IP67	LED	85	4100k	50000	Surface mounted	24	110	3	36.67	LED Continuous Flexible Strip, Surface mounted to bottom of facia plate, sideways bending
	M1	Lumenpulse	Lumendome	LMDM-48V-RGB-WH-WM	LED	NA	RGB	120000	Wall Mount	227	95	12	7.92	LED 6" Color changing dome. Power source found in Appendix C
	M2	Lumenpulse	Lumendome	LMDM-48V-RGB-WH-CN	LED	NA	RGB	120000	Surface mounted	227	95	12	7.92	LED 6" Color changing dome. Power source found in Appendix C

Project Lighting Power Density by Space

Project:	SUNY Cortland SLC			Date:	1/20/2014
				Revised:	4/4/2014
Space	Design Wattage	SF or LF	LPD by Code	Watts Allowed	Design LPD
Lobby	2,435.7	5,469	0.90	4922.1	0.45
Gym	12,301.0	16,856	0.92	15507.52	0.73
Track	9,847.0	13,132	0.82	10768.24	0.75
Exterior Sidewalks	567.0	5,437	0.80	4349.6	0.10
Exterior Landscaping	0.0	17,070	0.05	853.5	0
Totals	25150.7	57,964.00	0.63	36,400.96	0.43
				% BETTER/WORSE THAN CODE*	30.91%

Appendices



Quantitative Design Criteria					
	Horizontal Illuminance (E_h)			Vertical Illuminance (E_v)	
Space/Task	Average (lux)	Ave:min	CV	Average (lux)	LPD (W/SF)
Weight Training Floor: E_h @ 2.5';E_v @ 5'	218	1.75	N/A	128	.73
Cardio Loft Floor	294	1.53	N/A	213	
Walkway: E_h @ Floor;E_v @ 5'	138	1.90	N/A	83	