Karlsberger

Blending Green With Lean in Your Laboratory

Discover the most effective ways
to achieve a step-by-step transition
to Green and Lean capability

Presented by:

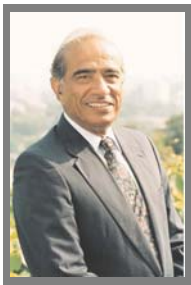
Vassilios I. Nicolaou, AIA

Vice President

Louis J. Pallay, AIA, LEED® AP

Senior Associate

Presenters



Vassilios I. Nicolaou, AIA

Vice President, Chief Lab Designer

With 50 years of professional experience, Vassilios Nicolaou, AIA, is the Vice President, Senior Laboratory Architect at Karlsberger. In his 20 years with the firm, Vassilios has served as an expert for laboratory planning and design. Many accomplishments have added to his storied career, including Alabama Council of American Institute of Architects (AIA) two-time award winner, and first place team member award winner for the Milwaukee Waterfront Master Plan. Vassilios is also National Council of Architectural Registration Boards (NCARB) certified, a member of the Biotechnology Association of Alabama, and was an instructor at the University of Alabama at Birmingham School of Engineering.

Louis J. Pallay, AIA, LEED® AP

Senior Associate, Project Architect

Louis J. Pallay, AIA, LEED® AP is a Senior Associate, Project Architect with Karlsberger. With more than 20 years of professional experience, Lou specializes in design and document coordination for research facilities. His expertise includes complex laboratory and research spaces for leading academic medical centers. A LEED® accredited professional, Lou earned a bachelor of arts and sciences from the Knowlton School of Architecture at The Ohio State University and is a member of the American Institute of Architects.

The most effective ways to Green and Lean

- A Brief Overview of Lean Methodology
- Green Design Healthcare - Case Studies
- Specific LEED® approaches that work with Lean design

A Brief Overview of Lean Methodology

Trends of Lean Methodology

- Consolidations
- Flexibility/Adaptability
- Open/Interactive
- Automation/Robotics
- Labor Shortage
- Integration
- Green Design

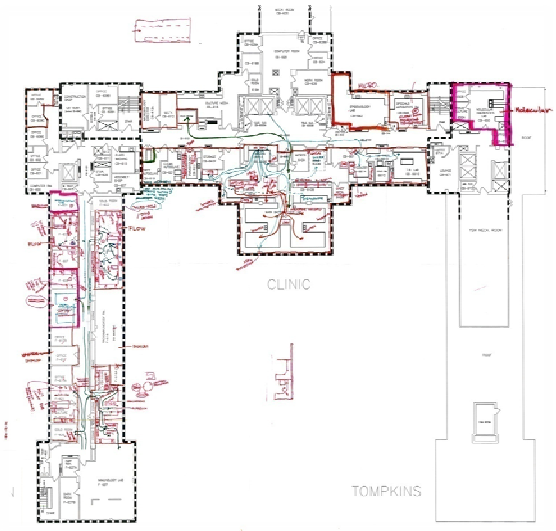
Lean Objectives

- Reduce Turn-Around-Time (TAT).
- Eliminate waste.
- Reduce total cost.
- Improve quality.
- Improved productivity.

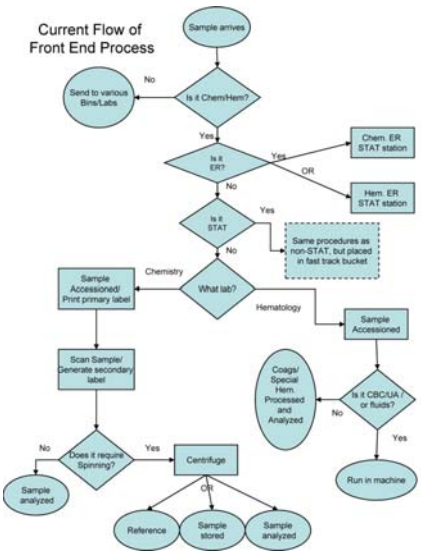
Forms of and Contributions of Waste

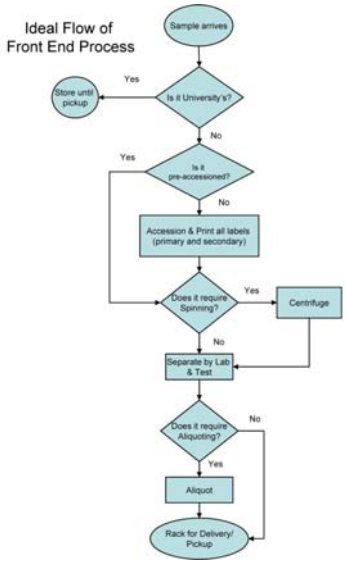
- Correction
- Unevenness
- Overproduction
- Waiting
- Transport
- Over processing
- Excess inventory
- Motion
- Correction of defects
- Underutilization

Existing Sixth Floor Travel Distances

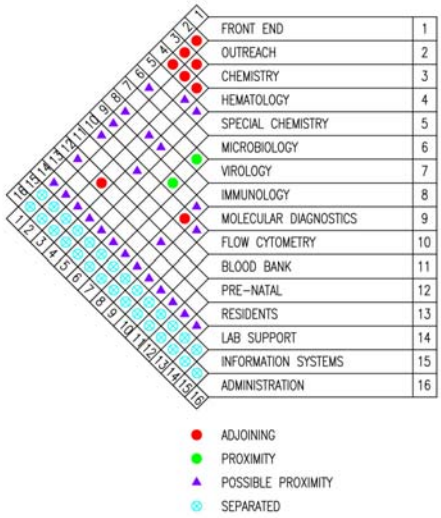


Flow Process

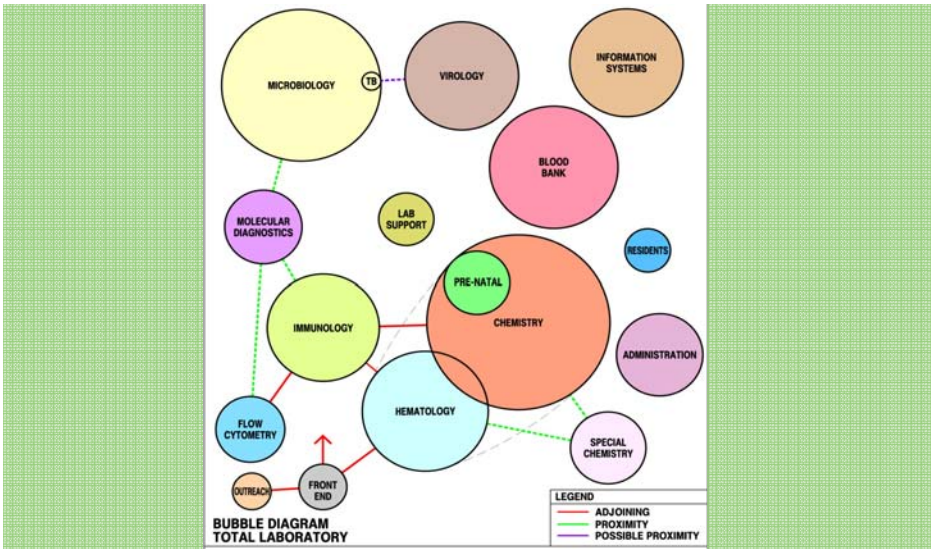




Proximity Matrix



Bubble Diagram



Benchmark and Comparative Analysis

BENCHMARK AND COMPARATIVE ANALYSIS - TEST VOLUMES & FTE'S

	FACILITY LOCATION	TEST VOLUME	STAFF FTE's	SQUARE FOOTAGE	SQUARE FOOT COST ORIGINAL	SQUARE FOOT COST 2005	SQUARE FOOT COST 2006	TEST / FTE	SQUARE FEET / FTE
1	Illinois	2,231,514	225	61,485	$175.00	$179.00	$183.00	9,918	273
2	Minnesota	2,555,082	360	52,625	$191.00	$195.00	$200.00	7,097	146
3	Wisconsin	4,500,000	350	51,910	$146.00	$149.00	$153.00	12,857	148
4	Florida	1,419,109	203	38,397	$130.00	$133.00	$136.00	6,991	189
5	Vermont	2,500,000	252	49,656	$266.00	$272.00	$278.00	9,921	197
6	Florida	2,494,108	308	48,315	$174.00	$178.00	$182.00	8,098	157
7	Florida	8,447,348	592	72,356	$217.00	$222.00	$227.00	14,269	122
8	Wisconsin	2,100,000	307	36,133	$175.00	$179.00	$183.00	6,840	118
9	New York	2,500,000	316	30,000	$160.00	$164.00	$167.00	7,911	95
10	Ohio	3,819,531	272	41,695	$141.00	$144.00	$147.00	14,042	153
11	New York	1,250,000	112	15,430				11,161	138
	Overall Average	3,074,245	300	43,652	$160.00	$163.60	$167.30	9,919	158
	NEW PROJECT (Existing)	5,032,669	227	42,765				22,170	188
	NEW PROJECT (Program)	8,222,323	261	60,919				25,490	233

Area Analysis

		Existing		%	Request.	%	Revised	%	Revised	%	Final	%
		Rm. No.	NSF	Distrib.	NSF	Distrib.	NSF	Distrib.	NSF	Distrib.	NSF	Distrib.
A	**SUPPORT SERVICES**		**763.69**	**14.7%**	**806.00**	**17.5%**	**806.00**	**16.7%**	**806.00**	**16.7%**	**806.00**	**15.5%**
a	Referral lab (in G103)	G103	456.20	8.8%	456.00	9.9%	456.00	9.5%	456.00	9.5%	456.00	8.8%
b	Receiving in (G103)	G103	120.66	2.3%	120.00	2.6%	120.00	2.5%	120.00	2.5%	120.00	2.3%
d	Phlebotomy (in G103)	G103	186.83	3.6%	230.00	5.0%	230.00	4.8%	230.00	4.8%	230.00	4.4%
B	**CORE LABORATORY**		**3,207.36**	**61.7%**	**2,476.00**	**53.7%**	**2,686.00**	**55.7%**	**2,686.00**	**55.7%**	**2,975.00**	**57.1%**
1	**Hematology/Coag/Urinalysis**		**895.63**	**17.2%**	**915.00**	**19.9%**	**915.00**	**19.0%**	**915.00**	**19.0%**	**915.00**	**17.6%**
a	Laboratory (in G103)	G103	885.47	17.0%	915.00	19.9%	915.00	19.0%	915.00	19.0%	915.00	17.6%
c	Storage	G106	10.16	0.2%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
2	**Chemistry**		**796.55**	**15.3%**	**871.00**	**18.9%**	**871.00**	**18.1%**	**871.00**	**18.1%**	**1,000.00**	**19.2%**
a	Laboratory (in G103)	G103	796.55	15.3%	871.00	18.9%	871.00	18.1%	871.00	18.1%	1,000.00	19.2%
3	**Pathologists Offices**		**966.77**	**18.6%**	**530.00**	**11.5%**	**580.00**	**12.0%**	**580.00**	**12.0%**	**580.00**	**11.1%**
b	Pathologist 1	G145	118.73	2.3%	120.00	2.6%	120.00	2.5%	120.00	2.5%	120.00	2.3%
c	Pathologist 2	G146	115.00	2.2%	120.00	2.6%	120.00	2.5%	120.00	2.5%	120.00	2.3%
d	Pathologist 3	G147	116.72	2.2%	120.00	2.6%	120.00	2.5%	120.00	2.5%	120.00	2.3%
e	Pathologist 4	G148	134.91	2.6%	120.00	2.6%	120.00	2.5%	120.00	2.5%	120.00	2.3%
f	Secretary/ Reception	G150	481.41	9.3%	50.00	1.1%	100.00	2.1%	100.00	2.1%	100.00	1.9%
4	**Supervisors and Techs Offices**		**548.41**	**10.5%**	**160.00**	**3.5%**	**320.00**	**6.6%**	**320.00**	**6.6%**	**480.00**	**9.2%**
a	Lab Support Supervisor/Lead	G108	118.00	2.3%	80.00	1.7%	80.00	1.7%	80.00	1.7%	120.00	2.3%
b	Lab Manager	G107A	246.22	4.7%	80.00	1.7%	80.00	1.7%	80.00	1.7%	120.00	2.3%
c	Technical Supervisor/Lead	G112	66.19	1.3%	0.00	0.0%	80.00	1.7%	80.00	1.7%	120.00	2.3%
d	Technical Supervisor PM/Lead	G104	118.00	2.3%	0.00	0.0%	80.00	1.7%	80.00	1.7%	120.00	2.3%
C	**BLOOD BANK**		**788.74**	**15.2%**	**853.00**	**18.5%**	**853.00**	**17.7%**	**853.00**	**17.7%**	**853.00**	**16.4%**
1	**Laboratory**		**788.74**		**853.00**	**18.5%**	**853.00**	**17.7%**	**853.00**	**17.7%**	**853.00**	**16.4%**
a	Blood Bank Laboratory In G103)	G103	722.55	13.9%	773.00	16.8%	773.00	16.0%	773.00	16.0%	773.00	14.8%
b	Lead Tech	G105	66.19	1.3%	80.00	1.7%	80.00	1.7%	80.00	1.7%	80.00	1.5%
D	**SHARED AREAS**		**440.51**	**8.5%**	**473.00**	**10.3%**	**473.00**	**9.8%**	**473.00**	**9.8%**	**573.00**	**11.0%**
b	Staff Lounge	G100	273.00	5.2%	273.00	5.9%	273.00	5.7%	273.00	5.7%	273.00	5.2%
e	Storage	G103B	167.51	3.2%	200.00	4.3%	200.00	4.2%	200.00	4.2%	300.00	5.8%
	SUMMARY											
A	**SUPPORT SERVICES**		**763.69**	**14.7%**	**806.00**	**17.5%**	**806.00**	**16.7%**	**806.00**	**16.7%**	**806.00**	**15.5%**
B	**CORE LABORATORY**		**3,207.36**	**61.7%**	**2,476.00**	**53.7%**	**2,686.00**	**55.7%**	**2,686.00**	**55.7%**	**2,975.00**	**57.1%**
C	**BLOOD BANK**		**788.74**	**15.2%**	**853.00**	**18.5%**	**853.00**	**17.7%**	**853.00**	**17.7%**	**853.00**	**16.4%**
D	**SHARED AREAS**		**440.51**	**8.5%**	**473.00**	**10.3%**	**473.00**	**9.8%**	**473.00**	**9.8%**	**573.00**	**11.0%**
	TOTAL NSF (A, B, C, D)		**5,200.30**	**100.0%**	**4,608.00**	**100.0%**	**4,818.00**	**100.0%**	**4,818.00**	**100.0%**	**5,207.00**	**100.0%**

Test Volume

BILLABLES

Laboratory	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16
Hematology	518,724	544,660	571,893	600,488	630,512	662,038	695,140	729,897	766,392	804,711	844,947
Immunology	157,913	165,809	174,099	182,804	191,944	201,541	211,619	222,199	233,309	244,975	257,224
Microbiology	221,155	232,213	243,823	256,015	268,815	282,256	296,369	311,187	326,747	343,084	360,238
Blood Bank	279,977	293,976	308,675	324,108	340,314	357,329	375,196	393,956	413,654	434,336	456,053
Chemistry	3,506,098	3,681,403	3,865,473	4,058,747	4,261,684	4,474,768	4,698,507	4,933,432	5,180,104	5,439,109	5,711,064
Pheresis	9,100	9,555	10,033	10,534	11,061	11,614	12,195	12,805	13,445	14,117	14,823
Virology	110,601	116,131	121,938	128,034	134,436	141,158	148,216	155,627	163,408	171,578	180,157
Prenatal	18,735	19,672	20,655	21,688	22,773	23,911	25,107	26,362	27,680	29,064	30,517
SMC	88,135	92,542	97,169	102,027	107,129	112,485	118,109	124,015	130,216	136,726	143,563
Totals:	**4,910,438**	**5,155,960**	**5,413,758**	**5,684,446**	**5,968,668**	**6,267,101**	**6,580,457**	**6,909,479**	**7,254,953**	**7,617,701**	**7,998,586**
Per Cent Total Laboratory Changes		**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**

Outreach	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16
Hematology	2,161	2,269	2,383	2,502	2,627	2,758	2,896	3,041	3,193	3,352	3,520
Immunology	2,643	2,775	2,914	3,060	3,213	3,373	3,542	3,719	3,905	4,100	4,305
Microbiology	2,511	2,637	2,768	2,907	3,052	3,205	3,365	3,533	3,710	3,895	4,090
Blood Bank	-										
Chemistry	1,420	1,491	1,566	1,644	1,726	1,812	1,903	1,998	2,098	2,203	2,313
Pheresis											
Virology	3,486	3,660	3,843	4,035	4,237	4,449	4,672	4,905	5,150	5,408	5,678
Prenatal	2,903	3,048	3,201	3,361	3,529	3,705	3,890	4,085	4,289	4,504	4,729
Totals:	15,124	15,880	16,674	17,508	18,383	19,302	20,268	21,281	22,345	23,462	24,635
Per Cent Total Outreach Changes		**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**
Totals Laboratory and Outreach	**4,925,562**	**5,171,840**	**5,430,432**	**5,701,954**	**5,987,051**	**6,286,404**	**6,600,724**	**6,930,760**	**7,277,298**	**7,641,163**	**8,023,221**

Storage Analysis
(Flow Cytometry Supplies)

Description	Room Number	Room Name	Type	Size (Inches) w x D x Ht	Quantity	Remarks	Linear Feet	Square Feet	Cubic Feet
Storage Cabinets in hallway	F606		Bulk	51 x 30 x 72	9	w/ 5 adjustable shelves	38.3	95.6	573.8
						Total Cabinets for Bulk Storage	**38.3**	**95.6**	**573.8**
Shelves	F605		Point of Use	66 x 12 x 2	2	* Resistents Books	11.0	11.0	1.8
Wall Storage Cabinets	F605		Point of Use	36 x 15 x 30	3	* File Slides	8.6	10.9	27.3
Wall Storage Cabinets	F605		Point of Use	48 x 15 x 30	3	* File Reports	12.0	15.0	37.5
Under counter storage cabinets	F605		Point of Use	24 x 20 x 24	11	* Some have Drawers	22.0	36.7	73.3
File Cabinets	F605		File	15 x 27 x 55	9	* Contains 5 Drawers	11.3	25.3	116.0
File Cabinets	F605		File	15 x 27 x 29	1	* Contains 2 Drawers	1.3	2.8	6.8
						Storage, part of Casework	**66.3**	**101.7**	**262.6**
Shelves	F606		Point of Use	36 x 12 x 2	6	*	18.0	18.0	3.0
Shelves	F606		Point of Use	66 x 12 x 2	4	*	22.0	22.0	3.7
Shelves	F606		Point of Use	84 x 12 x 2	1	*	7.0	7.0	1.2
Wall Storage Cabinets in lab	F606		Point of Use	48 x 15 x 30	7	*	28.0	35.0	87.5
Under counter Storage Cabinets	F606		Point of Use	24 x 20 x 24	21	*	42.0	70.0	140.0
File Cabinet	F606		File	15 x 27 x 55	1	* Contains 5 Drawers	1.3	2.8	12.9
						Storage, part of Casework	**118.3**	**154.6**	**248.2**

FLOW CYTOMETRY REFRIGERATORS, FREEZERS

Description	Room Number	Room Name	Type Refrigerator, Freezer	Temp °C	Size (Inches) w x D x Ht	Quantity	Remarks	Linear Feet	Square Feet	Cubic Feet
Shelves	F606		Refigerator	2-8	30 x 29 x 41	3	GE	7.5	18.1	61.9
Shelves	F606		Refigerator	2-8	23 x 22 x 34	4	Counter refrigerator 5.5 cu.ft	7.7	14.1	39.8
Drawers	F606		Refigerator	2-8	22 x 6 x 7	1	Counter refrigerator 5.5 cu.ft	1.8	1.2	0.7
Drawers	F606		Refigerator	2-8	12 x 17 x 7	2	GE	2.0	2.8	1.7
Drawers	F606		Refigerator	2-8	12 x 17 x 5	1	GE	1.0	1.4	0.6
							Total Refrigerator Shelves	**20.0**	**37.7**	**104.7**
Shelves	F606		Freezer	-20	30 x 29 x 20	2	GE	5.0	12.1	20.1
							Total Freezer Shelves	**5.0**	**12.1**	**20.1**
Chest Freezer	F609		Freezer	-70	29 x 29 x 46	1		2.4	5.8	22.4
							Chest Freezer	**2.4**	**5.8**	**22.4**

NOTES: 1. asterisk (*) denotes part of casework or room furniture

Lineal Feet Analysis

Department	Ft	Counter Equipment Lf	Floor Equipment Lf	Total Lf	Lf Revised	Lf Final
Outreach		39	0	**39**		
Tolerance 15% (Space between equipment)				6		
Work Benches 5'(2)	5 x 2			10		
Total Needed LF				**55**		
Growth 10%				5		
Current Proposed LF				**60**		
Front-End		89	12	**101**		
Tolerance 15% (Space between equipment)				15		
Work Benches (in Chemistry and Hematology)				0		
Total Needed LF				**116**		
Growth 10%				12		
Current Proposed LF				**127**		
Chemistry		327	163	**490**		
Tolerance 15% (Space between equipment)				73		
Work Benches 5'(28)	5 x 28			140		
Total Needed LF				**703**		
Growth 10%				70		
Current Proposed LF				**773**		
Hematology		252	63	**315**		
Tolerance 15% (Space between equipment)	5 x 29			145		
Work Benches 5'(29)				146		
Total Needed LF				**606**		
Growth 10%				61		
Current Proposed LF				**667**		
Microbiology		328	171	**499**		
Tolerance 15% (Space between equipment)				75		
Work Benches 5'(38)	5 x 38			190		
Total Needed LF				**764**		
Growth 10%				76		
Current Proposed LF				**840**		

Staffing

* Includes Flow Cytometry and Molecular Diagnostics

		EXISTING STAFFING											PROJECTED STAFFING										
		DAYS			EVENING			NIGHTS			TOTAL	TOTAL	DAYS			EVENING			NIGHTS			TOTAL	TOTAL
		M-F	Sat.	Sun.	M-F	Sat.	Sun.	M-F	Sat.	Sun.	FTE's	Staff	M-F	Sat.	Sun.	M-F	Sat.	Sun.	M-F	Sat.	Sun.	FTE's	Staff
A	CHEMISTRY										51	79										64.8	96
	Supervisor	6	1	1	1	1	1	1	1	1	9.2	14	6	1	1	1	1	1	1	1	1	9.2	14
	Team Leads	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Techs	21	8	8	6.5	3.5	3.5	5.5	3	3	38.8	62	33	9	9	6.5	3.5	3.5	6.5	4	4	52.6	79
	Independant Worker (Florie)	0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	1
	Managers	2	0	0	0	0	0	0	0	0	2	2	2		0	0	0	0	0	0	0	2	2
B	HEMATOLOGY										39	63										44.2	73
	Manager	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	1
	Supervisor/Coordinators	4	1	1	1	0	0	0	0	0	5.4	7	4	1	1	1	0	0	0	0	0	5.4	7
	Techs	11	4	4	6	3	3	3	3	3	24	40	11	5	5	6	4	4	3	3	3	24.8	44
	LAs	5	2	2	1	1	1	1	1	1	8.6	15	7	2	2	2	1	1	2	2	2	13	21
F	MICROBIOLOGY										23.6	38										29.8	45
	Manager	1									1	1	1									1	1
	Supervisor/Coords	3	1	1	1		1				4.6	7	3	1	1	1		1				4.6	7
	Techs	11	8	3	1	1					14.4	24	15	9	3	1	1		1			19.6	30
	Lab Associates	1	1	1	1	1					2.6	5	2	1	1	1	1					3.6	6
	Microbiology Fellow	1									1	1	1									1	1
G	VIROLOGY (Non-Winter)										12.4	14.8										15	19.8
	Mgr	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	1
	Coordinators	2	0	0	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	2	2
	Techs	7	2	1	0.8	0	0	0	0	0	8.4	10.8	8	2	2	1.8	1	1	0	0	0	11	15.8
	Lab Associates	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	1
I	IMMUNOLOGY*										17.4	19										24.8	28
	Manager	1									1	1	1									1	1
	Supervisor	3									3	3	3									3	3
	Techs	11	1	1							11.4	13	18	3	1							18.8	22
	Lab Associates	2									2	2	2									2	2
J	BLOOD BANK										21.8	33										22.8	34
	Manager	1									1	1	1									1	1
	Supervisors	2									2	2	2									2	2
	Other administrative	1									1	1	1									1	1
	Blood Bank Fellow	1									1	1	2									2	2
	Lab associate	1									1	1	1									1	1
	Techs	7	3	3	4	2	2	2	2	2	15.8	27	7	3	3	4	2	2	2	2	2	15.8	27
N	OUTREACH										5	5										5	5
	Manager	1									1	1	1									1	1
	Lab Associate	1			1						2	2	1			1						2	2
	Administrative	2									2	2	2									2	2
											0	0										0	0
	TOTAL FTE's	112	6.4	5.2	25.3	2.5	2.3	12.5	2	2	184.6		141	7.4	5.8	26.3	2.9	2.7	15.5	2.4	2.4	206.4	
	TOTAL Staff	112	32	26	25.3	12.5	11.5	12.5	10	10		251.8	141	37	29	26.3	14.5	13.5	15.5	12	12		300.8

Equipment Schedule

Department: Pathology | Section: Laboratory | Prepared By: | PAGE 1 of 5

Equipment Number	Room Number	Description/Manufacture Model Number	Quantity	Size	Electrical: 115 volts	208 volts	Amps	Phase	Watts	Connected to network	Alarm	Dedicated Circuit	UPS	Emergency Circuit	Special Plug	Mechanical: Thermal Output (BTU's Hour)	Hood/size & type	Biological Safety Cabinet	Bunsen Hood	Vent	Plumbing: Air	Gas	Vacuum	CO2	Oxygen	Nitrogen	Floor Drain	Stand Pipe	Trap Primer	Cup Sink	Cold Water	Hot Water	DI Water	Installation: New	Existing	CFCI (Owner furnish & install)	CFCI (Owner furnish, contractor install)	CFCI (Contractor furnish & install)	Cut Sheet Attached	Remarks	LF of equipment counter-top	LF of floor equipment
		NOTE: Include the weight if over four hundred pounds.																																							
E1	CHEM	Dimension EXL/ Dade Behring-Siemens w/ Lo	2	100 x 46 x 49	X		20		1,275	X		X		X	X	5,293									X		X		X		X	X	X				X	Note 1	0.0	16.7
E1a	CHEM	UPS	1	8 x 16 x 12	X							X		X		1,500															X	X						1.3	
E1b	CHEM	Dade AFS 16D Cart Mount Millipore	1	30 x 30 x 16	X		10							X		580									X		X		X		X	X					X	Mount on E1b cart	2.5	
E1c	CHEM	AFS Mobile Cart/ Millipore ZAFSCART1	1	36 x 32 x 36	X		10																		X		X				X	X						0.0	3.0
E1d	CHEM	Printer	2	16 x 25 x 5	X																																			2.7	
E2	CHEM	Centaur CP/ Bayer-Siemens	2	43 x 29 x 32	X		10								X	1,709									X		X					X	X					X	Wt. 375 lbs.	7.2	
E2a	CHEM	UPS	2	8 x 16 x 12	X									X		1,500																X	X						1.3	
E2b	CHEM	PC W/ Monitor an Keyboard	1	21 x 8 x 21	X											750																	X	X						1.8	
E2c	CHEM	Printer	2	16 x 15 x 10	X											580																	X	X						2.7	
E3	CHEM	i-STAT / Abbott	1	6 x 9 x 2																													X	X				X	2 (9 volt) lithium batteries	0.5	
E4	CHEM	Blood Gas Analyzer / ABL 725	1	29 x 18 x 19	X				63	X		X		X		853																	X	X						2.3	
E4a	CHEM	UPS	1	8 x 16 x 12	X									X		1,500																	X	X						0.7	
E5	CHEM	Triage Meter	2	6 x 9 x 3																													X	X						1.0	
E6	HISTO	Chemical Hood/ Fisher Hamilton 540771P	1	48 x 30 x 61	X							X		X				X		X										X			X					X	With 12"x12" sink	0.0	4.0
E7	CHEM	Micro Osmometer	1	13 x 20 x 16	X		3		330																								X	X						1.1	
E8	HEMA	Sysmex XT-2000i	1	21 x 20 x 25	X		5			X		X														X		X	X					X	X				X	Wt. 27 lbs.	1.8	
E8a	HEMA	Sampler	1	21 x 10 x 8																														X	X						1.8	
E8b	HEMA	Pneumatic Unit	1	11 x 14 x 16	?	X	4									1,500																		X	X				X	Wt. 7.7 lbs.	0.9	
E8c	HEMA	Printer	1	16 x 15 x 10	X											580																		X	X						1.3	
E8d	HEMA	PC & Monitor	1	19 x 19 x 21	X																													X	X				X		1.6	
E8e	HEMA	UPS	1	6 x 17 x 8	X									X		1,500																		X	X						0.5	
E8f	HEMA	Reagent Cubes (on floor)	4	12 x 12 x 12																														X	X						4.0	

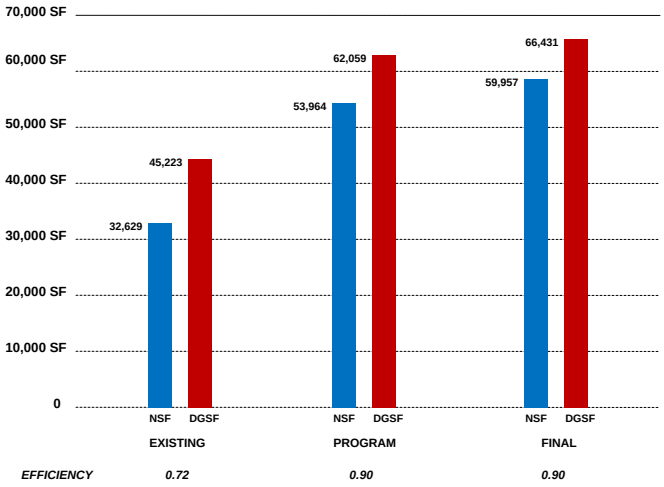
NOTES:

1. Provide 3" clearance on the right side.
   Provide dedicated Phone line
   Provide a 25-pinfemale connector

2 Total depth of Syamex 2000i and 1800 is 30 inches (2.5 ft.) (Could have floor drains rather than cup sinks?)
Total linear bench feet of eigher E8 or E9 is 4.5 ft. (this does not allow for workspace or for a lab computer).
E8a and E8b attach directly to the front of the Syamex instruments E8 and E9.

page 1 of 5	36.8	23.7
page 2 of 5	31.2	6.5
page 3 of 5	38.3	16.5
page 4 of 5	56.4	9.3
page 5 of 5	10.3	17.9
LF	173.0	73.9
TOTAL LF	246.9	

Area Analysis

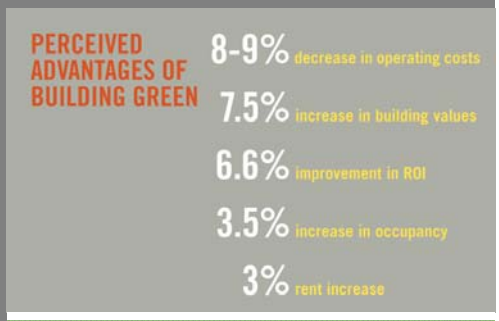


Green Design Healthcare - Case Studies

A Highly Complex Research Environment

Rationale to Achieve LEED® Certification

- Lowering the operating and maintenance costs
- Improved productivity
- Using green design and sustainability in the recruitment and retention of staff
- Enhanced health and well being
- Environmental stewardship



* According to the U.S. Green Build Council

The Positive Outcomes

Multiple benefits of A LEED project include:

- Substantial future energy and maintenance cost savings
- The creation of a standard of excellence for buildings
- The support and advancement of our professional responsibilities for environmental stewardship
- Expedited permitting (verify with local building authority)

LEED® Corporate Commitment

- Karlsberger now requires all staff to become LEED® Accredited Professionals
- Currently "greening" Karlsberger base specifications

A Platinum-level LEED® hospital

Dell Children's Medical Center of Central Texas

- First hospital in the world to achieve Platinum-level certification
- Construction Cost - $137,000,000
- Size - 473,000 sf
- Unique On-site Combined Cooling Heating Power Plant that produces energy more efficiently and reuses its by-products.

Dell Children's Medical Center of Central Texas

Clinical Laboratory

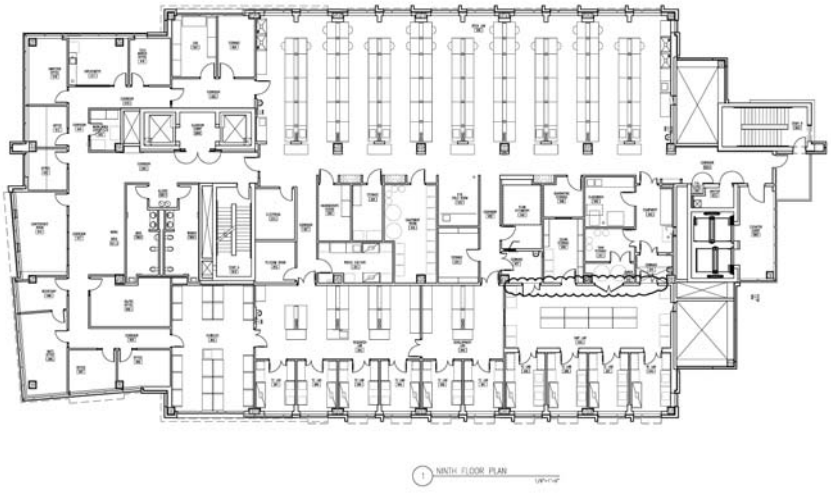
- Construction Cost - $3,035,433
- Size - 10,480 sf
- Surrounded by inviting courtyard spaces (1), the clinical laboratory (3) infuses natural light into the lab spaces.
- Courtyards also provide natural air circulation through out the lab spaces.

A Highly Complex Research Environment

University of Miami Biomedical Research Building

- 10-stories, 183,000 square foot
- $72,000,000
- Seven floors of research space
- Two floors of vivarium with imaging suites
- A penthouse for mechanical systems
- Two separate HVAC zones and duct systems for energy savings
  - Office and administrative areas recirculate a portion of the HVAC.
  - The laboratory areas exhaust 100-percent of the HVAC.
  - Flexible zone (office or laboratory space)

A Highly Complex Research Environment – Ninth Floor Plan



University of Miami Biomedical Research Building

Sustainable and LEED® certification design features

- Dedicated air handling units with reduced air exchanges for the office area
- Daylight harvesting reduced unnecessary artificial lighting requirements
- To eliminate redundant systems the future "sister" building will be supported by M/E/P systems in the annex attached to the Biomedical Research Building

University of Miami Biomedical Research Building

Sustainable and LEED® certification design features continued

- Purchase green power from local utility
- Recirculation animal watering system
- External egress stairs (reduced HVAC load/eliminate smoke EVAC)
- Low flow plumbing fixtures
- High efficiency lighting fixtures
- Cut-off light fixtures
- Lighting control system
- Heat recovery system

- Inventive reclamation system for the HVAC condensate that flushes half of the toilets and urinals
- Fully commissioned building systems to ensure efficient operations and maximum energy savings
- Shower facilities for bicyclers

Options Not Pursued

•Waterless Urinals

A Green Clinical Laboratory

Yale-New Haven Hospital Laboratory Relocation

- Construction Cost - $21,000,000
- Size - 80,000 sf
- Designed to achieve Silver-level LEED® Certification.
- Increased ventilation.
- Recycled and reused materials.

A Green Clinical Laboratory

Yale-New Haven Hospital Laboratory Relocation

- Low heat island effect using light colored roof membrane and light-colored paving.
- Interior and exterior lighting that reduces nighttime light pollution.
- Water use reduction of 40% including Laboratory process water.
- Optimized energy performance of 17% improvement over baseline design.

Specific LEED® approaches that work with Lean design

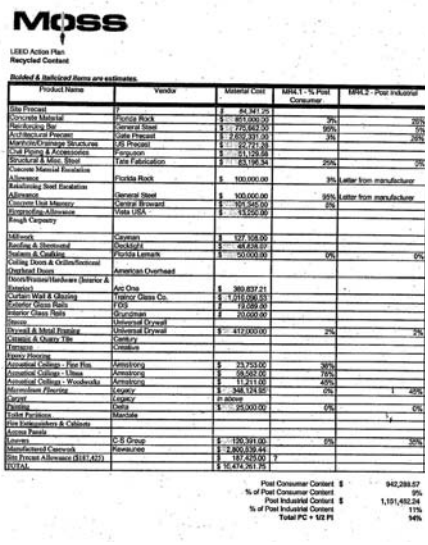
Aspects of LEED® Scoring

- Sustainable Sites
- Water Efficiency
- Energy & Atmosphere
- Materials & Resources
- Indoor Environment Quality
- Innovation & Design Process

Slide 31

j26 Environmental/sustainability artwork>?
jdeleon, 09/09/2008

LEED® Scorecard



Moss

LEED Action Plan
Recycled Content

Bolded & Italicized items are estimates.

Product Name	Vendor	Material Cost	MR4.1 - % Post Consumer	MR4.2 - Post Industrial
Site Precast	?	$ 84,341.25		
Concrete Material	Florida Rock	$ 851,000.00	3%	25%
Reinforcing Bar	General Steel	$ 770,962.00	95%	5%
Architectural Precast	Gate Precast	$ 2,800,337.00	3%	25%
Manholes/Drainage Structures	JB Precast	$ 22,721.20		
Shop Fixing & Accessories	Ferguson	$ 51,729.58		
Structural & Misc. Steel	Tate Fabrication	$ 63,126.34	25%	0%
Concrete Material Escalation Allowance	Florida Rock	$ 100,000.00	3%	Letter from manufacturer
Reinforcing Steel Escalation Allowance	General Steel	$ 100,000.00	95%	Letter from manufacturer
Concrete Unit Masonry	Central Broward	$ 101,542.00	5%	
Waterproofing-Allowance	Vista USA	$ 13,250.00		
Rough Carpentry				
Millwork	Cavnan	$ 127,108.00		
Roofing & Sheetmetal	Deckland	$ 48,638.07		
Sealants & Caulking	Florida Lemark	$ 50,000.00	0%	0%
Ceiling Doors & Grilles/Enclosed Overhead Doors	American Overhead			
Doors/Frames/Hardware (Interior & Exterior)	Arc One	$ 360,837.21		
Curtain Wall & Glazing	Traynor Glass Co.	$ 1,210,036.53		
Exterior Glass Rails	FGS	$ 72,089.80		
Interior Glass Rails	Grundman	$ 20,000.00		
Stucco	Universal Drywall			
Drywall & Metal Framing	Universal Drywall	$ 417,000.00	3%	3%
Ceramic & Quarry Tile	Century			
Terrazzo	Crosslink			
Epoxy Flooring				
Acoustical Ceilings - Fine Fins	Armstrong	$ 23,753.00	36%	
Acoustical Ceilings - Ultima	Armstrong	$ 56,502.00	76%	
Acoustical Ceilings - Woodworks	Armstrong	$ 11,211.00	45%	
Marmoleum Flooring	Lagoon	$ 348,124.95	0%	1 45%
Carpet	Legacy	in above		
Painting	Delta	$ 25,000.00	0%	0%
Toilet Partitions	Manilate			
Fire Extinguishers & Cabinets				
Access Panels				
Louvers	C-S Group	$ 130,391.00	0%	30%
Manufactured Casework	Rewsunee	$ 2,800,639.44		
Site Precast Allowance ($167,420)		$ 167,420.00 ?		
TOTAL		$ 16,474,261.75		

Post Consumer Content	$	942,288.57
% of Post Consumer Content		9%
Post Industrial Content	$	1,101,482.24
% of Post Industrial Content		11%
Total PC + 1/2 PI		14%

LEED-NC

LEED-NC 2.1 Letter Template
MR Credit 4.1 - 4.2: Recycled Content

Total value of post-consumer content	0
Total value of post-consumer content as a percentage of total cost of all materials	0
Total value of post-industrial content	0
Total value of post-industrial content as a percentage of total cost of all materials	0
Combined value of post-consumer and half of post-industrial content	0
Combined value of post-consumer content plus half of post-industrial content as a percentage of total cost of all materials	0

MR Cr. 4.1 (1 point):
Combined Post Consumer plus one-half Post Industrial >=5%
Points Documented: 0

MR Cr. 4.2 (1 additional point):
Combined Post Consumer plus one-half Post Industrial >=10%
Points Documented: 0

Project Name: INTERDISCIPLINARY LABORATORY B
Credit: MR Credit 4.1 - 4.2: Recycled Content
Points Documented: 0

READY TO SAVE THIS TEMPLATE TO LEED-ONLINE? Please enter your first name, last name and today's date below, followed by your LEED-Online Username and Password Associated with the Project listed above to confirm submission of this template.

Valerie	Eyer		skyer@kahlberger.com	
First Name	Last Name	Date	Username (Email Address)	Password

SAVE TEMPLATE TO LEED-ONLINE | PRINT TEMPLATE

Adobe LiveCycle

Aspects of LEED® Scoring

- Sustainable sites
  - These elements belong to the building not to the department
  - Potentially Lean design is departmental and does not effect the overall building except for –
    - Monitoring construction waste
    - Even if it is an infill, they can't trash all of their garbage
    - Bicycle use but you don't get value for Lean because you spend money to create those areas.
    - Outdoor environment/relaxation locations, again you are paying for it, is a healthy employee worth it?

Aspects of LEED® Scoring

- Water efficiency
  - Items that are applicable to a lab
  - Low flow fixtures and automatic controls
  - A point-of-use polishing / De-Ionized water as you need them
  - Not wasting money on a system that you are not going to use. Not installing a building wide system.

Aspects of LEED® Scoring

- Energy and atmosphere
  - Relies heavily on pre-requisites.
  - Building related

Aspects of LEED® Scoring

- Materials and Resources
  - Building/materials re-use and recycled
  - Regional materials
  - Certified wood
  - Whether materials is adding value to be Lean
    - Chemical resistant?
    - Lower costs?
    - Less maintenance?
    - Reparability and ease of replacement?

Aspects of LEED® Scoring

- Indoor Environmental Quality
  - Low-emitting materials
    - Adhesives, paints, carpet, composite wood
  - Indoor chemical and pollution source control
    - Separate copy rooms
  - Controllability of systems
    - Lighting and thermal
    - Lighting sensors
    - Office areas
  - Thermal comfort
  - Daylighting and natural images – adds to the psyche of staff

Aspects of LEED® Scoring

- Innovation and design
  - Can be implemented without affecting the Lean design
  - Anything completed over and above what is requested
    - Hand sanitizers as opposed to hand sinks?
    - At BRB – condensate water collection
    - University's green purchasing program – only buying green cleaning materials and recycled materials.
    - Water-less urinals
    - Clinical laboratory / LEED® education program / Wellness Initiatives

Building and Architectural Design Features

Design Features

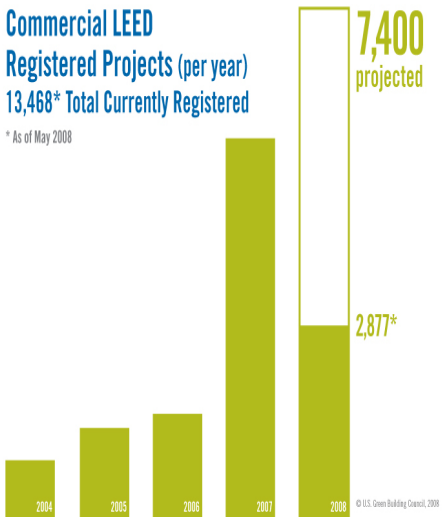
- To enhance sustainability and achieve LEED®:
  - Finishes can include low VOC paints and adhesives, carpet tile and linoleum tile
  - Recycled aluminum can be utilized wherever possible (curtain wall)
  - An Energy Star® roof (reducing heat gain) at the upper floors
  - Enclosed copy areas
  - Sunshades and building orientation reducing solar heat gain into the building
  - Encouraging stair use hopefully reducing elevator operations, while fostering collaboration.
  - Establishing an educational program

Slide 40

j12 Art that flows with text on right.
jdeleon, 09/09/2008

Flexibility – Flexibility – Flexibility

- Flexible design of laboratory spaces
  - Central core laboratory support space
  - Perimeter laboratories
  - Effective use of ghost corridors
  - Floor plate efficiency
  - Inherent flexibility is consistent and supportive of the LEED® philosophy and the creation of a sustainable environment.
  - A flexible design greatly reduces future retrofit construction waste.



Thank you!

Slide 42

j38 Environmental/sustainability artwork>?
jdeleon, 09/09/2008

Contact Information

Karlsberger

99 East Main Street
Columbus, OH 43215
(614) 461-9500
(614) 461-6324 (fax)

2509 Seventh Avenue South
Birmingham, AL 35233
(205) 901-6901
(205) 251-9618 (fax)

www.karlsberger.com

Karlsberger has been in continuous operation since 1928 providing full spectrum professional planning and architecture services. Headquartered in Columbus, Ohio, the firm also has offices in New York City; Birmingham, Alabama; and Karlsberger Healthcare Consulting, an independent, woman-owned business in Ann Arbor, Michigan.

Karlsberger is an internationally recognized leader in the programming, planning, design and architecture of contemporary, innovative laboratory environments. Design experience includes laboratory projects for healthcare, academic teaching/research, biomedical, production, public health, forensic and specialty laboratory clients.