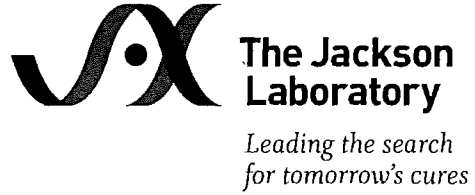


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Maine Technology Institute

MTAF CR2015

**Annual Report Submitted by
The Jackson Laboratory**

Date submitted: January 15, 2019

TABLE OF CONTENTS

I.	OPERATIONAL SUMMARY	3
II.	FACILITIES & ENGINEERING OVERVIEW	5
III.	APPENDICES	
	Appendix 1 Financial Certification	8
	Appendix 2. Floor Plans	9
	Appendix 3. Project Financial Summary	12

I. OPERATIONAL SUMMARY

The Center for Biometric Analysis (CBA) is a state-of-the-art facility for phenotyping in five major domains, and provides dedicated phenotyping expertise in each domain:

1. Metabolic Phenotyping: Encompassing multiple areas of metabolism.
2. Neurobehavioral Phenotyping: Encompasses diverse areas of behavior. This domain is carried out in the Connie Cogswell Rossi Center component of the CBA.
3. Physiology and Cardiac Phenotyping: Comprising diverse areas of physiology and cardiovascular biology.
4. Pre-clinical Imaging: Focused on visualization of mouse morphology and physiology.
5. High Throughput Phenotyping: Focused on operating a standardized, high throughput phenotyping pipeline.

In total, seventy seven (77) phenotyping platforms are available in the CBA, ranging from simple yet highly informative body weight to advanced methodologies such as implantable telemetry devices for measurement of movement, core temperature, blood pressure, electrocardiogram or electroencephalogram in conscious, freely moving animals; and ex vivo magnetic resonance imaging to ascertain the number and volume of kidney glomeruli, a marker of interest for transplant compatibility. In addition to the introduction of new platforms, the CBA has allowed for the Laboratory to have increased capacity of existing platforms. For example, the CBA allowed for the Laboratory to double rotorod and grip strength, two highly sought after phenotyping activities, and moved from 16 to 64 indirect calorimetry cages, capable of assessing metabolic rate and energy expenditure – critical markers of metabolic function.

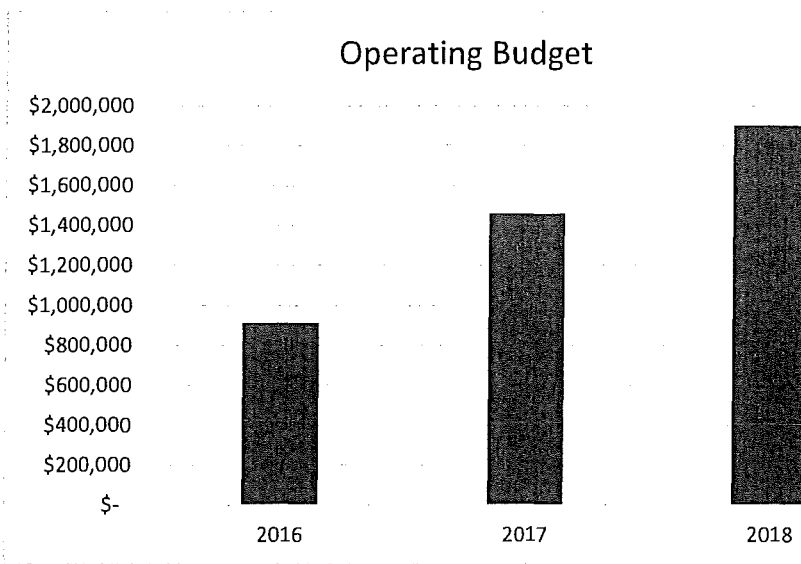
This expansion of capacity and capabilities will further enhance Maine's standing as a global leader in precision and genomic medicine by supporting grant applications and awards in a wide range of domains including addiction, aging, Alzheimer's disease, cardiovascular disease, and the International Mouse Phenotyping Consortium project KOMP, along with numerous affiliated supplementary awards such as those to study microbiome stability with time and between different knockout strains; introduce electroretinography, a physiological assessment of eye function, into the high throughput pipeline; and a pilot assessment of nociception screens for compatibility in a large scale and high throughput configuration. The CBA also supports the JAX In-Vivo Services team by providing phenotyping services to fee-paying external customers, typically from pharmaceutical and biotechnology companies. In support of the Cancer Center at the Laboratory, the CBA offers state-of-the-art imaging capabilities in the form of MRI and ultrasonography, which enable longitudinal survey of tumor progression.

The Laboratory had an economic impact of \$758 million to the Maine economy in 2017. Continued success in sponsored research funding was key to this impact. Overall the Laboratory continues to be successful at obtaining sponsored research funding. The Bar Harbor campus has seen a 6.6% increase in grants dollars awarded from 2017 to 2018, going from \$57.6 million to

\$61.4 million. Of the \$61.4 million in sponsored research awarded in 2018 the CBA leveraged \$7.7 million of this. This funding came from the National Institutes of Health.

The CBA allowed the Laboratory to develop a commercial collaboration with Sable Systems International, which is a company that develops and manufactures equipment for whole animal respirometry that offers courses in respirometry. In early 2018, Sable approached the Laboratory about being a 'beta test site' for a new version of their software system that runs and tracks all the metabolic parameters in their cage system. The Laboratory was eager to work with Sable, as the previous version of the software was proving to be less efficient to other offerings in the market. The Laboratory requested a quid pro quo from Sable for the testing and feedback that the Laboratory supplied to edit/improve Sable's software system. In return, Sable supplied the Laboratory with upgrades to our current cage systems, new software for all such systems, a \$0 maintenance fee and the loan of a new cage system that the Laboratory was able to purchase at a discount to incorporate into the CBA facility. In total, Sable supplied the Laboratory with approximately \$150K of value in the upgrades, software, and discounts applied. Recent discussions have included training Laboratory staff to service and maintain these systems, at a continued cost savings to the Laboratory.

In the past 12 months, twelve individuals have been recruited to the CBA team, including Dr Doug Morris, an internationally recognized pre-clinical imaging expert specializing in MRI; Dr Hongwei Jin, a nationally recognized expert in cardiovascular phenotyping with a superb repertoire of technical skills and biological knowledge that will support the cardiovascular and physiology domain; Judy Morgan, a superlative Program Manager who oversees the day to day operation of the CBA; and an array of recent Bachelor of Science and Masters graduates. There have also been numerous promotions within the team, and transfers of staff from the animal care team to the CBA phenotyping team, recognizing the culture of internal talent development and opportunities. Operationally the Laboratory has invested heavily in anticipation of the move into the CBA facility. Since 2016 the operating budget has grown 109% with 2018 forecasted to be \$1.9 million in operating costs.

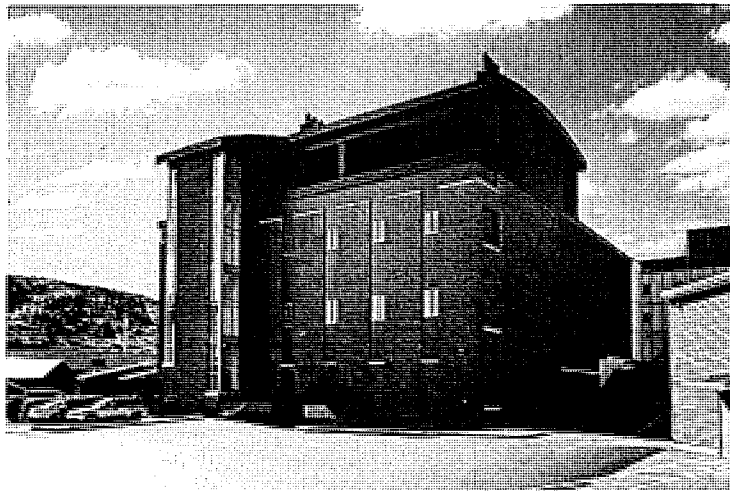


II. FACILITIES & ENGINEERING OVERVIEW

During the annual reporting period of 1/1/18-12/31/18 the Laboratory continued progress towards its goal of creating the CBA facility outlined in MTAF award CR2015.

Recapping previous reports, Harriman Associates of Auburn, ME was selected as the design team in 2015. Design efforts were completed in 2016 and through a competitive procurement process PC Construction of Portland, ME was selected as The Jackson Laboratory's Construction Manager. Ground was officially broken on the facility in August, 2016 and by the end of 2017 construction on the core CBA Phase I facility was completed.

Since 1/1/18, the CBA phase I portion of the project was fitted out with owner furnished materials, disinfected and sterilized, and has been occupied by a team of phenotyping and behavioral experts led by Dr. Jacqui White. The rooms are filled with a variety of scientific equipment purchased through this grant and supplied by the Laboratory outside of this project scope giving the Laboratory researchers the ability to interrogate the mouse in ways never before able.



As outlined on the floor plans attached, construction was completed and certificate of occupancy was received (12/27/17) on over 21,000 gsf of CBA space containing 24 isolated procedure rooms to perform individual simultaneous assays, two (2) animal holding spaces, clean and soiled materials circulation corridors, and over 1,250 GSF of support space for surgery, necropsy, imaging, and other specialized common activities. Collectively these areas are highlighted in red in the attached floor plans in appendix 2.

Since 1/1/18 the Laboratory has completed the Phase II portion of the project providing space for over 3,000 boxes of animals to be held in longitudinal housing close to the new CBA phenotyping and behavioral suites to minimize mouse movement for those animals undergoing long term physiological testing within the CBA. The certificate of occupancy for Phase II was received on September 28th, 2018. These areas are highlighted in green in the attached floor plans in appendix 2. All construction activities are complete and the area is currently being outfitted with fixed ventilated racking systems, portable changing stations, and laboratory casework for a projected Q1-19 beneficial use.

As of 12/31/18 the Laboratory had committed \$21.61 million (98%) of the \$21.68 million budget and has paid \$21.1 million to equipment suppliers, contractors, municipalities, and other vendors. A project financial summary of actuals vs. budget can be viewed in appendix 3.

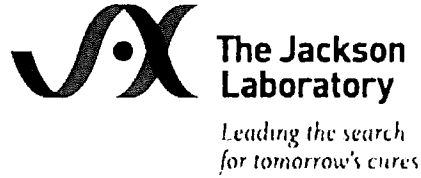
The 2019 year will see the Laboratory complete final outfitting and sterilization of the CBA Phase II longitudinal holding areas and submitting a final construction report.

APPENDICES

Appendix 1. Financial Certification

Appendix 2. Floor Plans

Appendix 3. Project Financial Summary



CR2015

January 15, 2019

TO: Maine Technology Institute
8 Venture Avenue, Brunswick Landing
Brunswick, ME 04011

Dear Ms. Bentley,

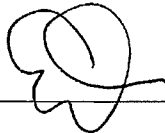
As a condition to the grant reporting requirements, attachment B item 3, during the construction period the undersigned hereby certifies for and on behalf of The Jackson Laboratory that:

- (a) As of the date of this Annual Report, to our knowledge, the expenditures summarized in the report related to the Grant Agreement and matching funds present fairly the financial positions of those instruments in all material respects. These expenditures are not audited.

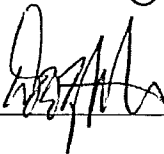
THE JACKSON LABORATORY
A Maine nonprofit corporation

By:

Edison T. Liu, President & CEO:

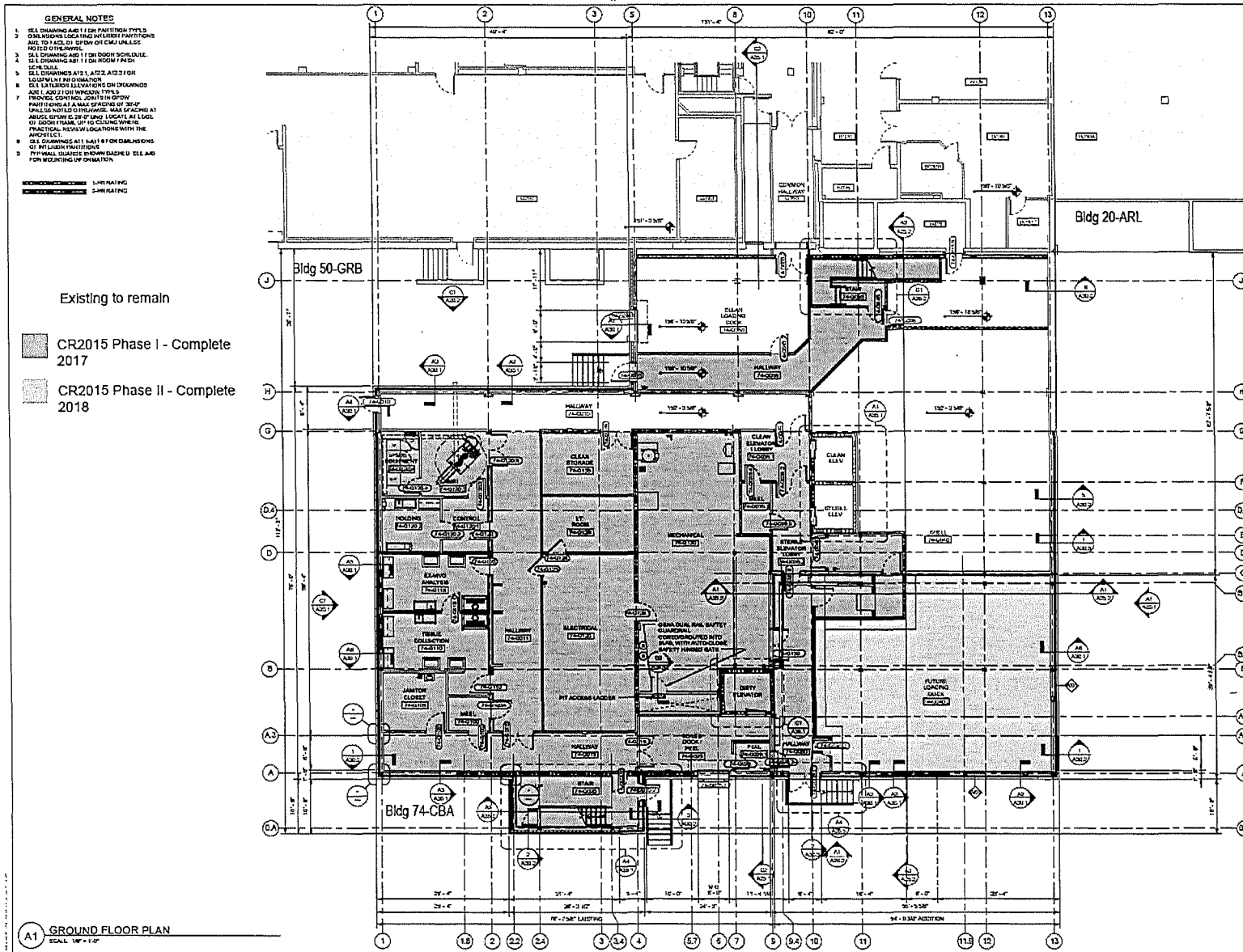


Douglas W. Abbott, Treasurer & CFO:



Date: January 15, 2019

Appendix 2 Floor Plans



HARRIMAN

ALUMINUM PORTABLE POTTY/STAIR BOXES

THE JACKSON LABORATORY CENTER FOR BIOMETRIC ANALYSIS - BUILDING 74



SYMBOLS LEGEND

- PRINTER FAC
- PARTITION CUT IN FLOOR SLAB
- ROOM NAME AND NUMBER
- DOOR & WINDOW LEVEL
- EQUIPMENT TAG

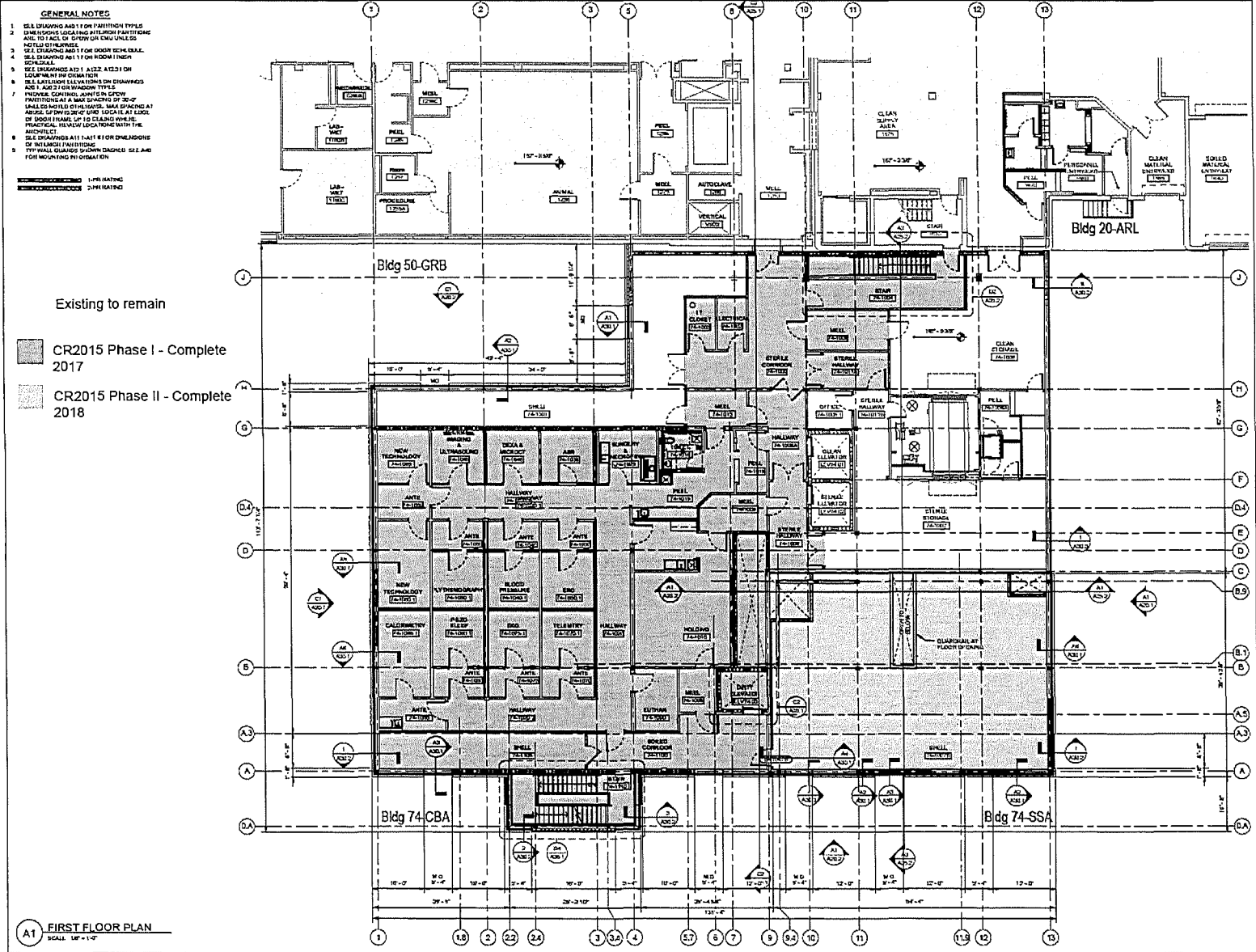
Author	_____
Date	_____
Project	_____

Scale	1/8" = 1'-0"
North Arrow	
Drawn By	_____
Checked By	_____

GROUND FLOOR PLAN

A10.1

Appendix 2 Floor Plans



AULON PETERAK PORTSMOUTH DESIGN

THE JACKSON LABORATORY CENTER FOR BIOMETRIC ANALYSIS - BUILDING 74

ONE HARRISON AVENUE
 PROJECT NUMBER: 17054



SYMBOLS LEGEND

	PRIORITY TAG
	ROOM NAME AND ALARM
	COLOR & BIOMETRIC USE NUMBER
	EQUIPMENT TAG

REVISIONS

NO.	DATE	DESCRIPTION

SCALE

1" = 10'-0"	1/8" = 1'-0"
-------------	--------------

DATE 02/17
BY JWC

FIRST FLOOR PLAN

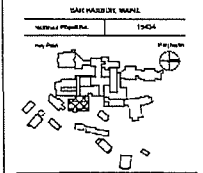
A10.3

Appendix 2 Floor Plans



HARRIMAN
ALBANY PORTLAND PORTSMOUTH SECTION

THE JACKSON
LABORATORY
CENTER FOR BIOMETRIC
ANALYSIS - BUILDING 74



SYMBOLS LEGEND

□ PARTITION WALL
SEE A10.1 FOR PARTITION TAG KEY
& PARTITION QUANTITIES DETAILS

ROOM NAME AND NUMBER
SEE A10.1 FOR SCHEDULE

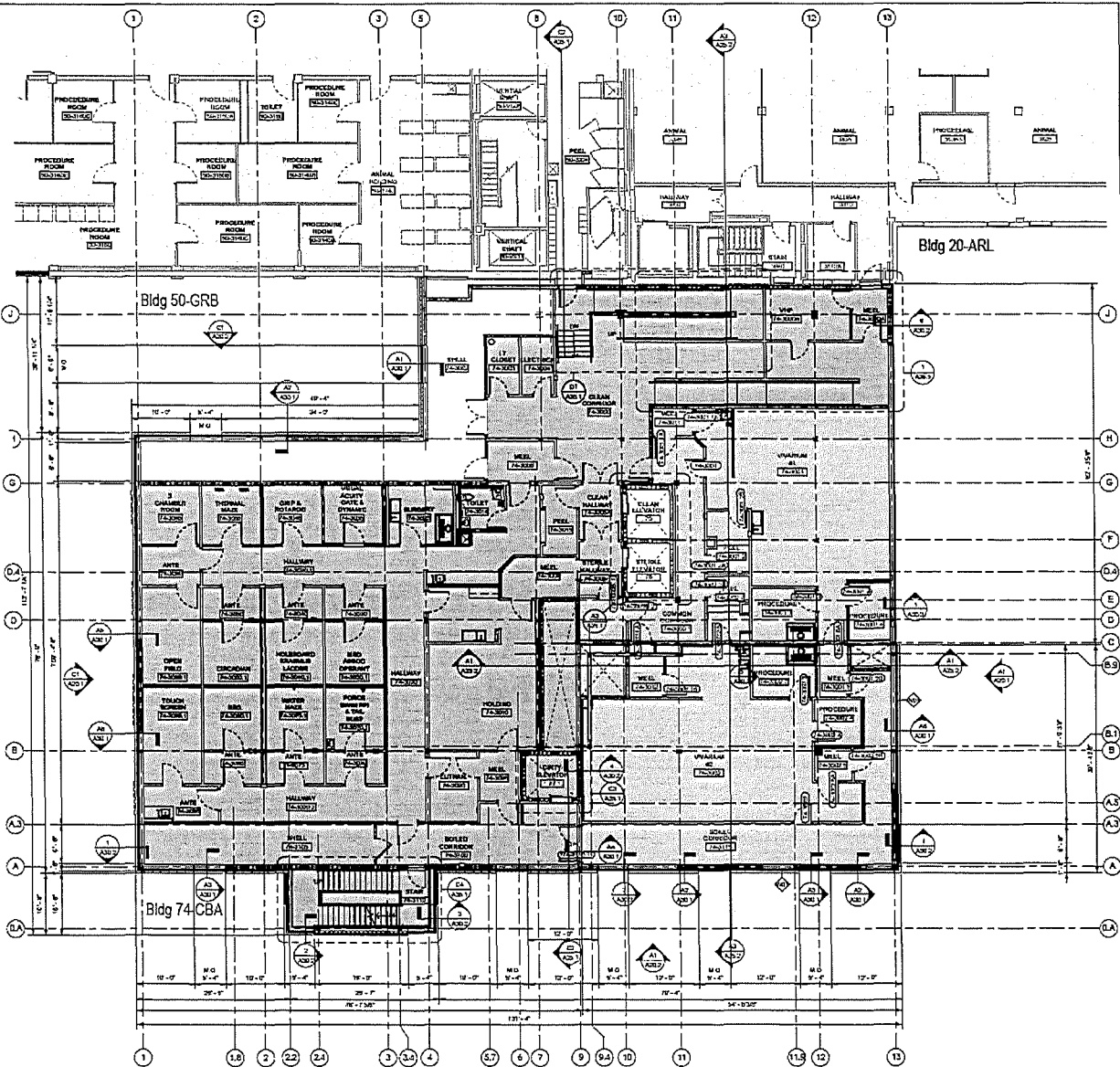
□ DOOR & REVISIONED LITE NUMBERS
SEE A10.1 FOR SCHEDULE

□ EQUIPMENT TAG
SEE SCHEDULE ON A10.2

Author/Designer	
Checker	
17024-01	08/20/17
Drawn by	MWD
THIRD FLOOR PLAN	
A10.5	

- GENERAL NOTES**
1. SEE DRAWING A10.1 FOR PARTITION TYPE
 2. DIMENSIONS LOCATING PARTITIONS ARE TO FACE UNLESS OTHERWISE NOTED
 3. SEE DRAWING A10.1 FOR DOOR SCHEDULE
 4. SEE DRAWING A10.1 FOR WINDOW SCHEDULE
 5. SEE DRAWING A10.1, A10.2, A10.3 FOR EQUIPMENT INFORMATION
 6. SEE SCHEDULES ON DRAWINGS
 7. ADD 2" FOR WINDOW TYPE PARTITIONS AT MAX. SPACING OF 20'-0" UNLESS NOTED OTHERWISE. MAX. SPACING AT ANGLE OTHER THAN 90° IS 1/2 THE MAX. SPACING AT 90° UNLESS NOTED OTHERWISE.
 8. SEE DRAWINGS A10.1 & A10.2 FOR DIMENSIONS OF INTERIOR PARTITIONS
 9. IF WALL CURVED SHOW DIMENSIONS FOR LOCATING INFORMATION
- LINE NOTED
--- DIM NOTED

- Existing to remain
- CR2015 Phase I - Complete 2017
 - CR2015 Phase II - Complete 2018



A1 THIRD FLOOR PLAN
SCALE: 1/8" = 1'-0"

Appendix 3 Project Financial Summary
(Numbers are not audited, as of 12/31/2018)

CBA - actuals by cost code

Filter By:
Project Name equals B74-Center for Biometric Analysis
Create Date between 01.01.2011 and 12.31.2017



CSI Division	Current Budget	Bond Issued Funds	JAX Funds	Actuals Paid	% of Budget
DESIGN FEES					
Division with Description: 94 - Design Fees	1,226,200.00	601,358.73	661,494.60	1,262,853.33	103%
Division with Description: 98 - Project Management & Oversight	0	999.22	1,099.15	2,098.37	0%
LEGAL & PERMITTING FEES					
Division with Description: 92 - Permitting	39,500.00	23,154.21	25,469.64	48,623.85	123%
Division with Description: 93 - Financial Requirements & Legal Requirements	30,000.00	10,366.63	11,403.29	21,769.92	73%
Division with Description: 97 - Inspection & Testing / Other	140,000.00	138,166.79	151,983.46	290,150.25	207%
CONSTRUCTION					
Division with Description: 01 - General Requirements	1,445,200.00	1,266,147.27	1,392,761.99	2,658,909.26	184%
Division with Description: 02 - Existing Conditions	423,400.00	52,977.74	58,275.51	111,253.25	26%
Division with Description: 03 - Concrete	382,400.00	241,689.56	265,858.52	507,548.08	133%
Division with Description: 04 - Masonry	245,100.00	301,069.09	331,176.00	632,245.09	258%
Division with Description: 05 - Metals	493,000.00	474,461.68	521,907.84	996,369.52	202%
Division with Description: 06 - Wood, Plastic, Composites	119,500.00	21,372.20	23,509.42	44,881.62	38%
Division with Description: 07 - Thermal & Moisture Protection	226,200.00	624,182.60	686,600.86	1,310,783.46	579%
Division with Description: 08 - Openings	510,000.00	310,547.20	341,601.91	652,149.11	128%
Division with Description: 09 - Finishes	1,202,200.00	1,097,790.82	1,207,569.91	2,305,360.73	192%
Division with Description: 10 - Specialties	143,400.00	109,345.71	119,180.29	227,526.00	159%
Division with Description: 11 - Equipment	38,900.00	3,808.38	4,189.21	7,997.59	21%
Division with Description: 12 - Furnishings - Installation	71,700.00	27,625.94	30,388.54	58,014.48	81%
Division with Description: 13 - Special Construction	23,900.00	41,847.62	46,032.38	87,880.00	368%
Division with Description: 14 - Conveying Equipment	549,700.00	188,653.81	207,519.19	396,173.00	72%
Division with Description: 21 - Fire Suppressor	143,400.00	135,366.46	148,903.11	284,269.57	198%
Division with Description: 22 - Plumbing	241,200.00	786,211.24	864,832.37	1,651,043.61	685%
Division with Description: 23 - Heating, Ventilating, & Air Conditioning (HVAC)	2,295,500.00	1,113,652.12	1,225,017.33	2,338,669.45	102%
Division with Description: 26 - Electrical	1,057,700.00	832,859.24	916,145.17	1,749,004.41	165%
Division with Description: 27 - Communications	95,600.00	19,377.22	21,314.94	40,692.16	43%
Division with Description: 28 - Electronic Safety and Security	95,600.00	1,809.52	1,990.48	3,800.00	4%
Division with Description: 31 - Earthwork	335,700.00	130,720.50	143,792.56	274,513.06	82%
Division with Description: 32 - Exterior Improvement	215,100.00	18,759.52	20,635.48	39,395.00	18%
Division with Description: 33 - Utilities	1,195,000.00	38,729.70	42,602.67	81,332.37	7%
Division with Description: 86 - Interior Specialties - Provisor	71,700.00	1,683.90	1,852.29	3,536.19	5%
Division with Description: 88 - Furnishings - Provisor	626,400.00	95,279.04	104,806.94	200,085.98	32%
Division with Description: 89 - Communications	45,000.00	3,556.18	3,911.80	7,467.98	17%
BUILDING & SCIENTIFIC EQUIPMENT					
Division with Description: 87 - Equipment - Provisor	5,826,800.00	1,211,142.55	1,332,256.80	2,543,399.35	44%
CONTINGENCIES					
Division with Description: 99 - Contingencies	2,125,000.00	76,287.60	186,340.60	262,628.20	12%
Grand Total	21,680,000.00	10,000,000.00	11,102,424.24	21,102,424.24	97%