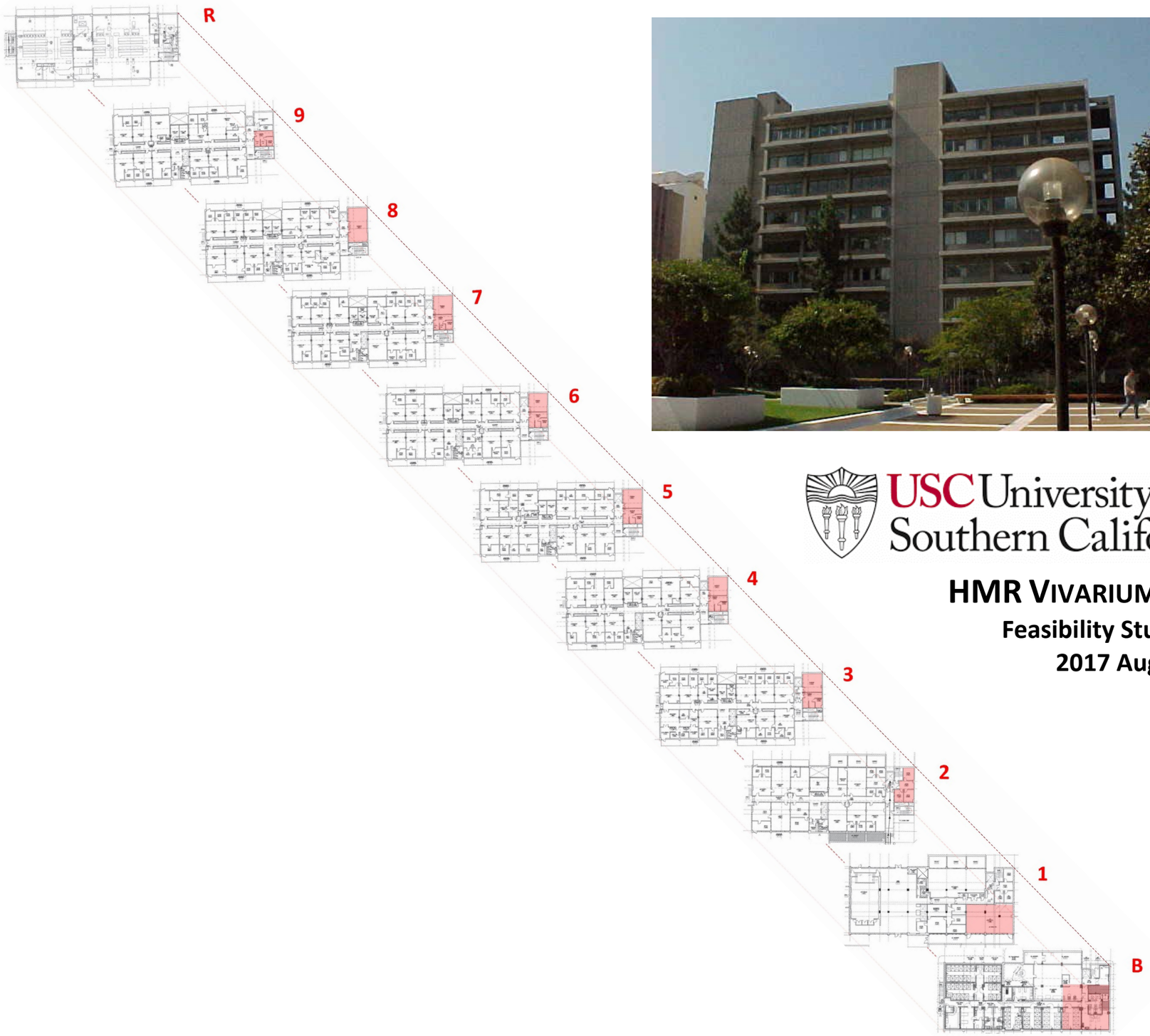


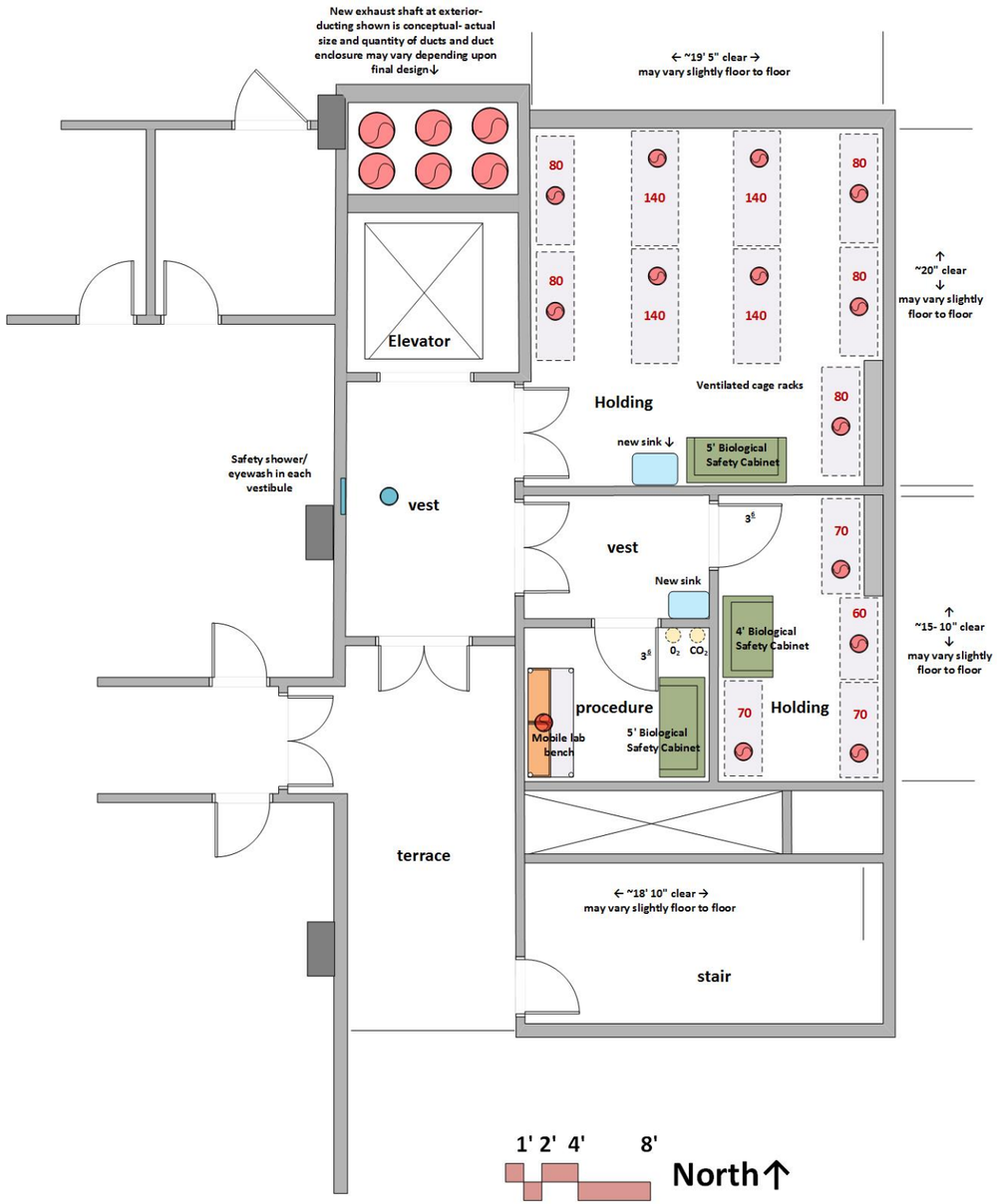
USC University of Southern California

HMR Vivarium Renovation

Feasibility Study

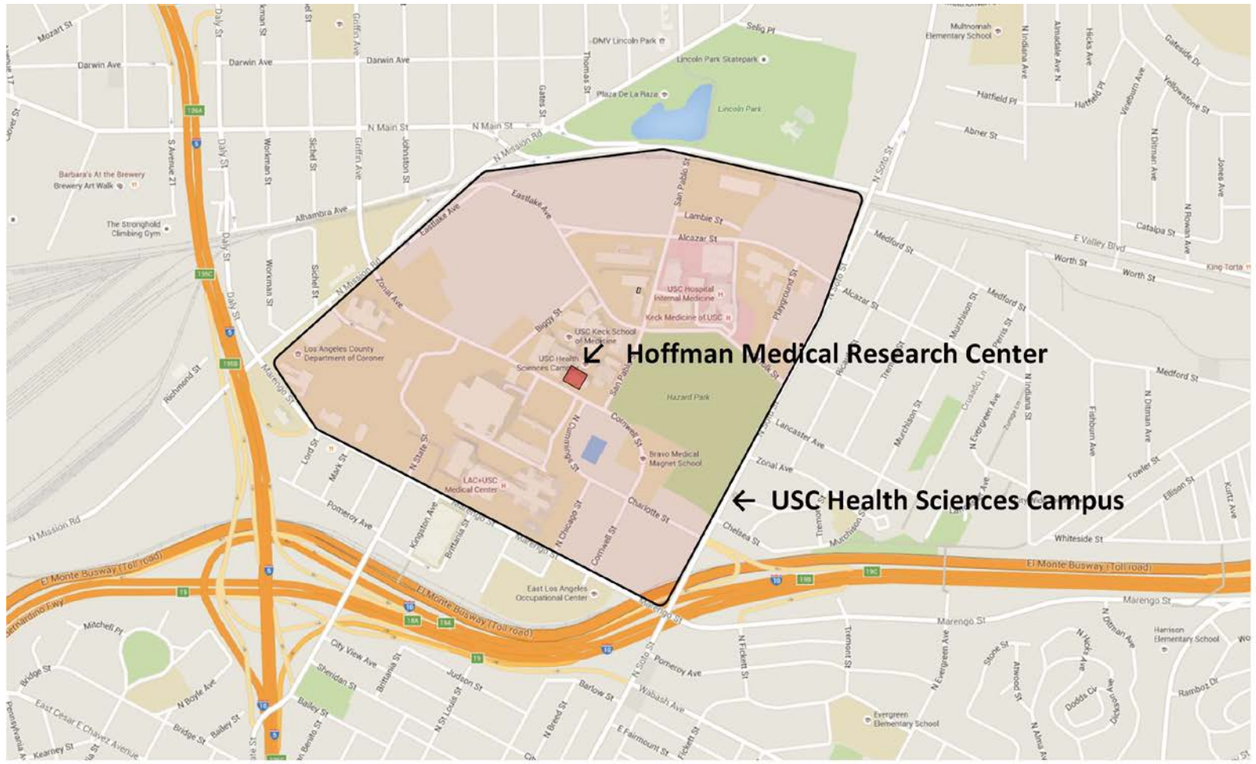
2017 Aug 31

Design for Science



CONTENTS

EXECUTIVE SUMMARY



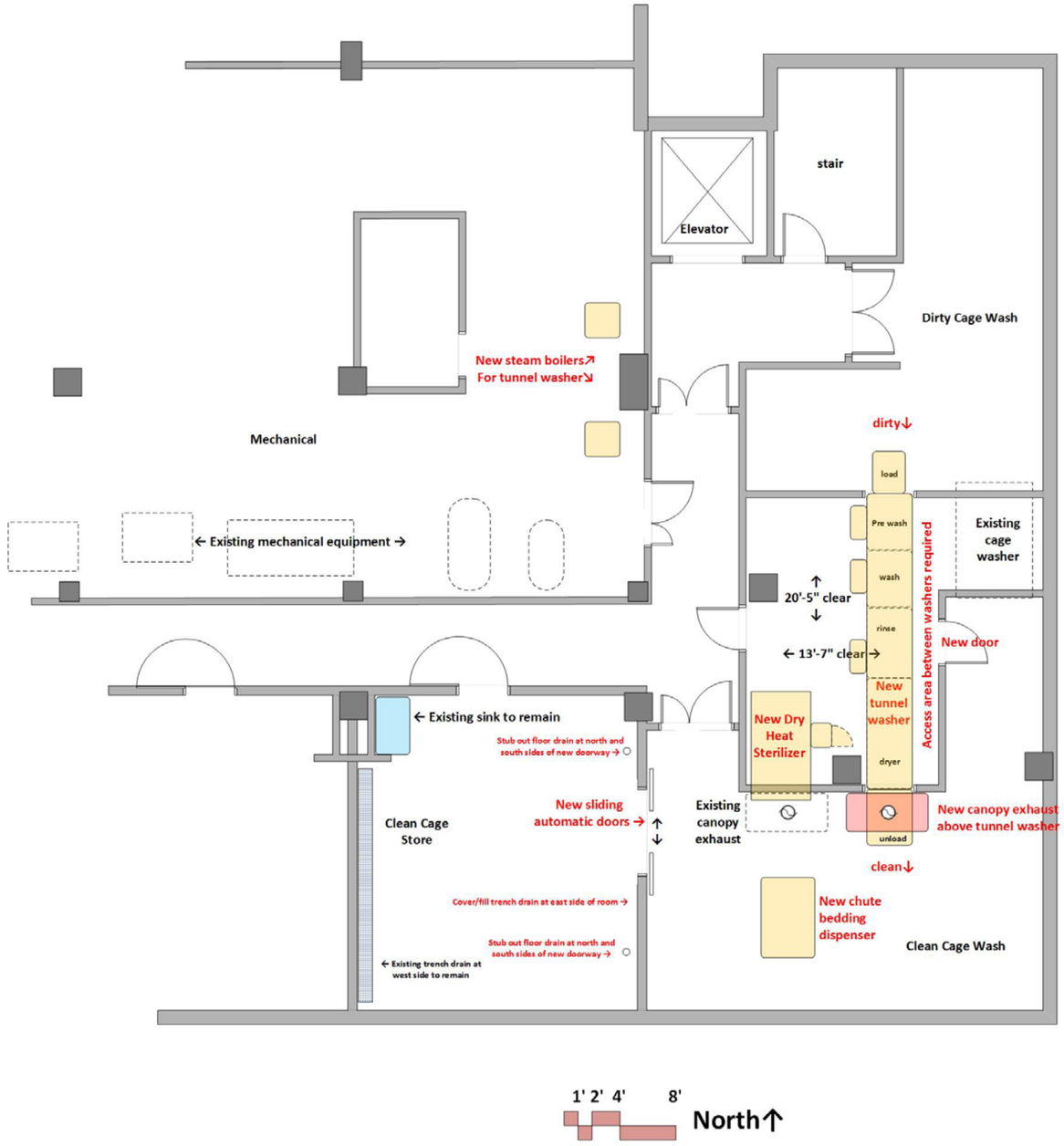
The Hoffman Medical Research (HMR) Center is located at the center of the USC Health Sciences Campus (HSC) in East Los Angeles. HMR is one of the original Health Science Campus buildings, constructed in 1967. It has undergone a recent seismic retrofit, renovations of the lobby, and infrastructure improvements including an electrical upgrade.

The HMR vivarium provides critical animal housing facilities for biomedical research programs contained within the HMR and adjacent research buildings. In addition, the facility was listed as a site for expansion of animal research activities in the *Report of the Health Science Campus Long Range (10 year) Animal Facility Planning Committee* (March 2012). The expansion is necessary in order to meet increased demand for animal housing space on the HSC and to make up for the anticipated loss of leased animal housing space on the HSC within the next three years. However, the existing tower vivarium spaces are antiquated and have not had any major renovation in the 50 years since the building was constructed. The inefficient layout of the facility rooms precludes any significant expansion of activities without major renovation.

The proposed HMR vivarium renovation outlined in this feasibility study consists of approximately 7,500 gross square feet (5,800 net square feet assignable space) over eleven floors. The total funding required for the renovation is estimated at $14.1 million, of which $8.8 million is estimated as the construction hard cost. Moving costs (both out and back in) will be carried by the Department of Animal Research and are excluded from this estimate.

To emphasize, this renovation project will allow for more than a doubling of the capacity for housing rodents without adding additional square feet of space in HMR. This will be accomplished through the creation of more efficient floor plans, and a provision of individually ventilated rack systems and cages that allow for high capacity rodent housing. The project will also add a tunnel washer in the basement of the facility to expand the cage washing capacity and a dry heat sterilizer to optimize the bio-exclusion program required for modern biomedical research. And in order to accommodate this renovation, very significant addition and relocation of new and existing MEP infrastructure will be necessary.

Three schedule scenarios have been developed based upon upcoming Board meetings and the anticipated end of the Doheny lease in January 2020.



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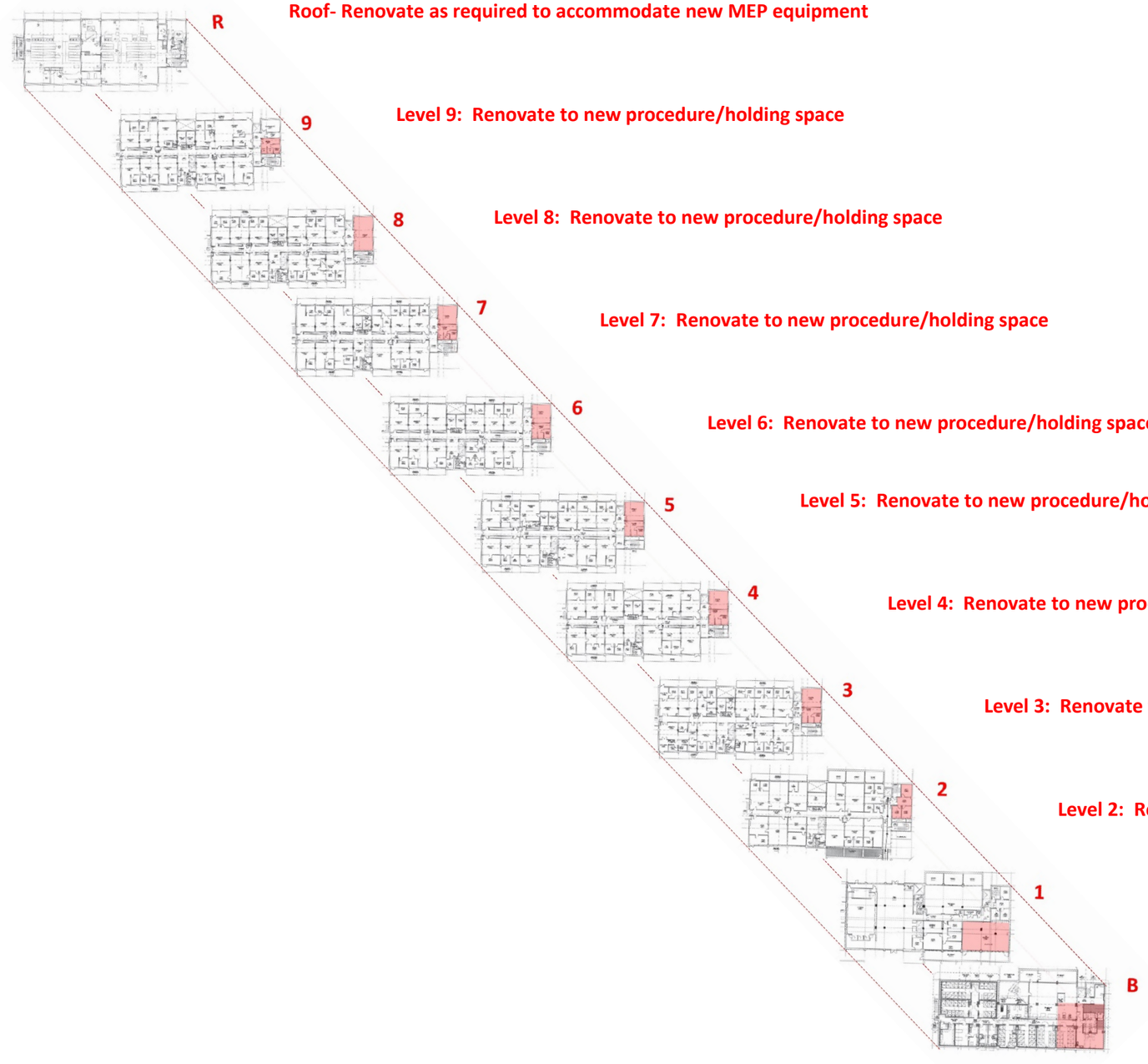
RENOVATION SUMMARY



Roof- Renovate as required to accommodate new MEP equipment

Level 9: Renovate to new procedure/holding space

Level 8: Renovate to new procedure/holding space

Level 7: Renovate to new procedure/holding space

Level 6: Renovate to new procedure/holding space

Level 5: Renovate to new procedure/holding space

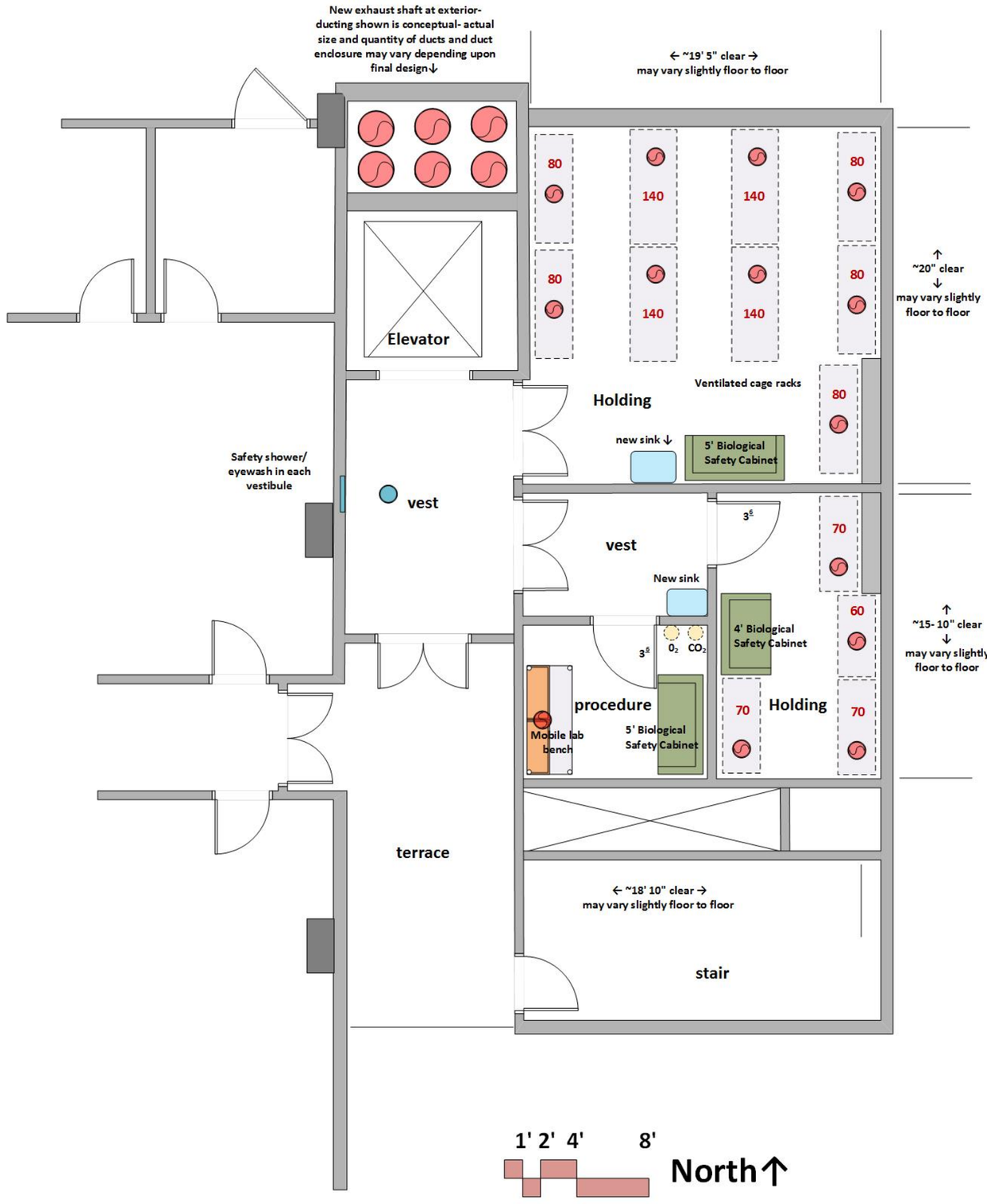
Level 4: Renovate to new procedure/holding space

Level 3: Renovate to new procedure/holding space

Level 2: Renovate to new procedure/holding space

Level 1: Renovate mechanical room as needed

Basement: add tunnel washer, new autoclave, new doors, new exhaust



GENERAL CONCEPT LAYOUT

Example: Level 3

ARCHITECTURAL

Occupancy: B
Floor: methyl methacrylate with integral coved base
Walls: metal stud with concrete backer board with fiberglass finish & epoxy paint
Soundproofing in holding room walls
Aluminum wall guards at corridor
Ceiling: waterproof gypsum board with fiberglass finish and epoxy paint at 10'
no access panels inside holding rooms and procedure rooms; Limit ceiling access panels to corridor
Doors: 3'-6"x8'-0" with red glass view window
Vermin proof: all penetrations to rooms sealed
Sound attenuation: NC 35 or less; sound insulation in walls and above ceiling.
Security: card key access

STRUCTURAL

Existing to remain

MECHANICAL

Temperature: 70 deg F +/- 2 deg F
Humidity: 30-70% relative
100% exhaust; Air changes: 10 air changes/hour plus exhaust for ventilated cage racks
Air change rate may be higher due to equipment heat gain
Pressure: Negative or positive depending upon use
Controls: BMS environmental monitoring for temperature, humidity, pressure, and lighting; with digital display at each holding room
Provide air exhaust connections at ceiling for ventilated cage racks

PLUMBING

Domestic tepid water at safety shower/eyewash in vestibule
Floor drain at safety shower/eyewash in vestibule
Animal watering system
Provide centrally piped 0_2 and CO_2 if available from building system; if not provide cylinder tanks for 0_2 and CO_2 in Procedure room

ELECTRICAL

115v20a1ph outlets at walls and ceilings (cage racks)
Standby power- all MEP systems on emergency power
New emergency generator required
Hardwire and wireless data
Lighting: recessed, sealed LED at 600 LUX with circadian lighting controls (intermatic timers at each room)
300 LUX unoccupied with manual switch for 600 LUX
White light for day cycle, red light for night cycle
Fire alarm: red strobe light

CONTRACTOR FURNISHED EQUIPMENT

Safety shower/eyewash in vestibule
Stainless steel casework and sink in Procedure Room
Mobile lab bench in Procedure Room
Cylinder restraints

UNIVERSITY FURNISHED EQUIPMENT

Ventilated cage racks- Allentown standard
Animal changing station (acs)
Biological safety cabinets
CO2 and O2 cylinders

SPACE PROGRAM

~5,800 net square feet
~7,500 gross square feet (use for cost)

Floor	Room Name	Approx. Dimensions	Area			Quantity		Subtotal		cage count	notes
Roof	**Roof top**							0	nsf		Not counted as part of assignable space. Requires upgrade to MEP equipment.
9	**Holding/Procedure Suite**	20' x 37'	740	asf	x	1	=	740	nsf	270	
8	**Surgery/Procedure Suite**	20' x 37'	740	asf	x	1	=	740	nsf		
7	**Holding/Procedure Suite**	20' x 37'	740	asf	x	1	=	740	nsf	1230	
6	**Holding/Procedure Suite**	20' x 37'	740	asf	x	1	=	740	nsf	1230	
5	**Holding/Procedure Suite**	20' x 37'	740	asf	x	1	=	740	nsf	1230	
4	**Holding/Procedure Suite**	20' x 37'	740	asf	x	1	=	740	nsf	1230	
3	**Holding/Procedure Suite**	20' x 37'	740	asf	x	1	=	740	nsf	1230	
2	**Holding/Procedure Suite**	20' x 30'	600	asf	x	1	=	600	nsf	500	
1	**Mechanical Room**							0	nsf		Not counted as part of assignable space. May require upgrade to MEP equipment.
Basement	**Cage Wash**	50'x52'	2600	asf	x	1	=	2600	nsf		Includes upgrade to MEP equipment in mechanical room
Basement	**MEP Room**		0					0	nsf		Includes upgrade to MEP equipment in mechanical room
	Totals							**5780**	**nsf**		
							Total cage count			**6920**	

EQUIPMENT SCHEDULE

Contractor Furnished Equipment	Manufacturer	Model	Dimensions	Quantity	Locatioon	Electrical	Plumbing	Mechanical	Remarks
Tunnel Washer	Better Built	Tunnel Washer T224	~53" W x 99" H x 336" L	1	Basement	480V 208V 115V	Steam Hot Water Cold Water Compressed Air Drain	800 cfm exhaust	Includes bedding dispenser on clean side
Dry Heat Autoclave	Gruenberg	Cage Rack Floor Access	~53" W x 134" H x 95" L	1	Basement	480V 208V 115V		500 cfm exhaust	Top mount piping/conduit Provide heat attenuation at floor and walls
Animal Watering System	Edstrom	RO System 790 Indigo Ultrafilter UF-400 Pulse CMC	varies	1	Level 2	115V	Cold Water Drain		Includes ultrafilter and CMC (critical monitoring & control)

Owner Furnished Equipment	Manufacturer	Model	Dimensions	Quantity	Locatioon	Electrical	Plumbing	Mechanical	Remarks
4' Biological Safety Cabinet II-A	Nuaire	LabGard NU 677-400	54" W x 98" H x 33" D	7	Holding Rooms	115V			No external exhaust
5' Biological Safety Cabinet II-A	Nuaire	LabGard NU 677-500	66" W x 98" H x 33" D	14	Holding Rooms	115V			No external exhaust
Cage Rack 140	Allentown	403889	~29" W x 71" L x 92" H	20	Holding Rooms	115V			Include fan unit with each rack
Cage Rack 80	Allentown	407632	~23" W x 72" L x 92" H	29	Holding Rooms	115V			Include fan unit with each rack
Cage Rack 70	Allentown	407632	~23" W x 63" L x 92" H	18	Holding Rooms	115V			Include fan unit with each rack
Cage Rack 60	Allentown	407632	~23" W x 57" L x 92" H	9	Holding Rooms	115V			Include fan unit with each rack

BUDGET SUMMARY

See budget details page 45

USC
Capital Construction Development

PROJECT BUDGET WORKSHEET

Date: 08/04/2017
PR: PR044169
Name: HMR - Hoffman Core Lab Renovation Feasibility Study
Account Number: 16-7974-0952
Project Manager: Joe McIntyre
Description: Feasibility Study Cost Estimate for renovation of Vivarium Spaces and Addition of Tunnel Washer System, RO Water System, Steam Generator and associated equipment.**NOTE: Does not include for move in/move out costs.**

Gross Building Area:	**7,500**	**GSF**
Net Building Area:	**5,800**	**SF**
Cost per Gross SF:	**$ 1,534.16**	
Building Type:	**0**	

No.	Code		Item		Budget	% Total Budget	Comments
1	15118	/ 44710	Construction Contract	$	6,874,600		See detail on Project Budget Assumptions
2	15122	/ 44711	Other Construction	$	150,000		
3		/ 44713	Add 2nd floor per Dr. Casebolt (6/13/17)	$	89,800		
			Construction	$	**7,114,400**	62%	Total lines 1 through 3
4	15112	/ 44330	Site Preparation	$	0		
5	15110	/ 44331	Demolition	$	0		
6	15114	/ 44350	Utility Connections	$	0		
7	15115	/ 44355	Telecommunications/Data Lines	$	75,000		IT Infrastructure & Cabling
8	15113	/ 44360	Environmental Remediation	$	100,000		Abatement
9	15119	/ 44365	Audio Visual	$	0		
10	15120	/ 44366	Security	$	77,500		Access Control/Upgrade Existing
11	15116	/ 44510	Landscaping	$	0		
12	15109	/ 44530	Graphics / Signage	$	25,000		
13	15123	/ 44010	Furnishings - under $5K	$	0		
14	15127	/ 44810	Furnishings - over $5K	$	0		
15	15124	/ 44020	Movable Equipment - under $5K	$	0		
16	15128	/ 44821	Movable Equipment - over $5K	$	0		
17	15117	/ 44030	Fixed Equipment - under $5K	$	0		
18	15126	/ 44830	Fixed Equipment - over $5K	$	1,418,400		CFCI Equipment: See detail on Project Budget Assumptions
19		/ 44822	Moveable Equipment - Computers	$	0		
20		/ 44840	Vehicles	$	0		
21		/ 44850	Scientific Equipment Purchases	$	0		
			Other Construction	$	**1,695,900**	15%	Total lines 4 thru 21
			Subtotal Hard Costs	$	**8,810,300**	77%	Total lines 1 through 21
22	15100	/ 44210	Preliminary Expenses (Programming)	$	64,000		Preconstruction
23	15102	/ 44220	Architect / Engineer Fee	$	976,200		
24	15108	/ 44230	Owner's Consultants	$	108,800		
25	15101	/ 44240	Reimbursable Expenses	$	54,300		
26	15103	/ 44250	Project Management	$	335,200	3.0%	Project Management Fee Structure
27	15104	/ 44310	Certified Inspection	$	10,000		
28	15105	/ 44320	Soil Testing	$	0		
29	15106	/ 44340	Plan Check / Permit Fees	$	88,800		
30	15107	/ 44410	Legal / Administrative Services	$	5,000		
31	20230	/ 44420	O&M / Misc Expenses / Shutdown	$	13,000		FMS Work Orders
32	15111	/ 44610	Moving Expenses	$	25,000		Per Dr. Casebolt: By Customer (Supplemental Allowance here only)
			Soft Costs	$	**1,680,300**	15%	Total lines 10 thru 32
			Subtotal Hard and Soft Costs	$	**10,490,600**	91%	Total lines 1thru 30
33	15125	/ 44910	Total Contingency	$	1,015,600	10%	% of Hard and Soft Costs
			TOTAL PROJECT BUDGET	$	**11,506,200**	100%	Total lines 32 and 33
			Less Previously Funded		64,000		Preconstruction
			Owner Furnished Equipment	$	2,453,927		Also included animal changing stations, mobile lab benches, and bedding dispenser
			Add 2nd Floor Cages & BSC (6/13/17)	$	213,097		7 cage racks & 3 BSC
			TOTAL FUNDING REQUIRED	$	**14,109,224**		

Stainless Steel Casework

Floor	Qty	UNIT COST	Total	
2	1	$ -	$ -	
3	1	$ 25,000.00	$ 25,000.00	
4	1	$ 25,000.00	$ 25,000.00	
5	1	$ 25,000.00	$ 25,000.00	
6	1	$ 25,000.00	$ 25,000.00	
7	1	$ 25,000.00	$ 25,000.00	
8	1	$ 25,000.00	$ 25,000.00	
9	1	$ 25,000.00	$ 25,000.00	
Subtotal Stainless Steel Casework				$ 175,000.00

Biosafety Cabinets

Floor	Qty	UNIT COST	Total	
3		$ 12,000.00	$ -	3 BSC (separate line item)
3	3	$ 12,000.00	$ 36,000.00	
4	3	$ 12,000.00	$ 36,000.00	
5	3	$ 12,000.00	$ 36,000.00	
6	3	$ 12,000.00	$ 36,000.00	
7	3	$ 12,000.00	$ 36,000.00	
8	1	$ 12,000.00	$ 12,000.00	
9	2	$ 12,000.00	$ 24,000.00	
Subtotal Biosafety Cabinets				$ 216,000.00

Tunnel Washer	$ 300,000.00
Heat Sterilizer	$ 300,000.00
Animal Watering System	$ 427,349.00

Grand Total	**1,418,349.00**

BUDGET SUMMARY
Owner Furnished Equipment

		2nd floor	3rd floor	4th floor	5th floor	6th floor	7th floor	8th floor	9th floor	Total racks	2nd floor	3rd floor	4th floor	5th floor	6th floor	7th floor	8th floor	9th floor	Total Cages
Cage Racks 140	140		4	4	4	4	4	0	0	20		560	560	560	560	560	0	0	2,800
Cage Racks 80	80	4	5	5	5	5	5	0	0	29	320	400	400	400	400	400	0	0	2,000
Cage Racks 70	70		3	3	3	3	3	0	3	18		210	210	210	210	210	0	210	1,260
Cage Racks 60	60	3	1	1	1	1	1	0	1	9	180	60	60	60	60	60	0	60	540
											500	1230	1230	1230	1230	1230	0	270	6,920

Allentown Proposal #00019558 REV -A (dated 7/28/2017)

LUMP SUM $2,451,024

AVERAGE COST PER CAGE $354.19

				UNIT COST	
1	Cage Racks	Type	Qty	$354.19	Extention
2		140	20	354	991,743.82
3		80	29	354	821,730.59
4		70	18	354	446,284.72
5		60	9	354	191,264.88
6	Subtotal Cage Racks				$2,451,024
7					
8	Animal Changing Stations		6	$ 8,000.00	$ 48,000.00
9	Mobile Lab benches		10	$ 6,000.00	$ 60,000.00
10	Exam Lights - 8th floor		2	$ 10,000.00	$ 20,000.00
11	Bedding Dispenser		1	$ 52,000.00	$ 52,000.00
12	Subtotal 8, 9 & 10				$ 180,000.00
13	Total Owner furnished equipment				$ 2,631,024.00

	2nd Floor Cages					
1						
2						
3	80	4	320			
4						
5	60	3	180			
6			500	@	$354.19	$177,097

PROJECT SCHEDULE

See schedule details page 70

Scenario A

Board Approval-	Sep 2017
NTP to Design Team-	Sep 2017
Complete Design-	Mar 2018
Commence Construction-	Jul 2018
Substantial Completion-	Jul 2019
Move In-	Aug 2019
Doheny Move Out-	Jan 2020

Scenario B

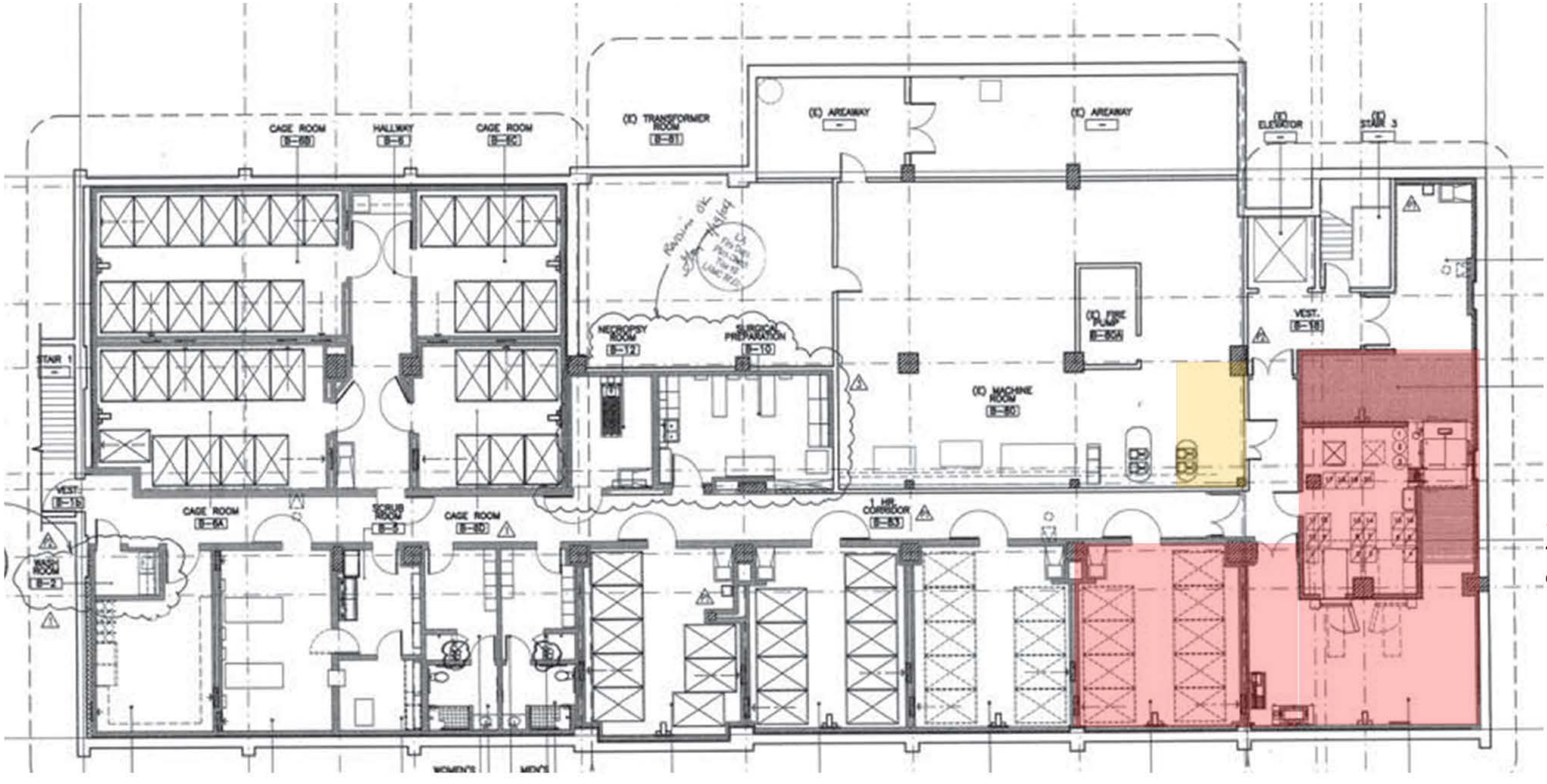
Board Approval-	Nov 2017
NTP to Design Team-	Nov 2017
Complete Design-	May 2018
Commence Construction-	Sep 2018
Substantial Completion-	Sep 2019
Move In-	Oct 2019
Doheny Move Out-	Jan 2020

Scenario C

Board Approval-	Jan 2018
NTP to Design Team-	Feb 2018
Complete Design-	Jul 2018
Commence Construction-	Nov 2018
Substantial Completion-	Nov 2019
Move In-	Dec 2019
Doheny Move Out-	Jan 2020

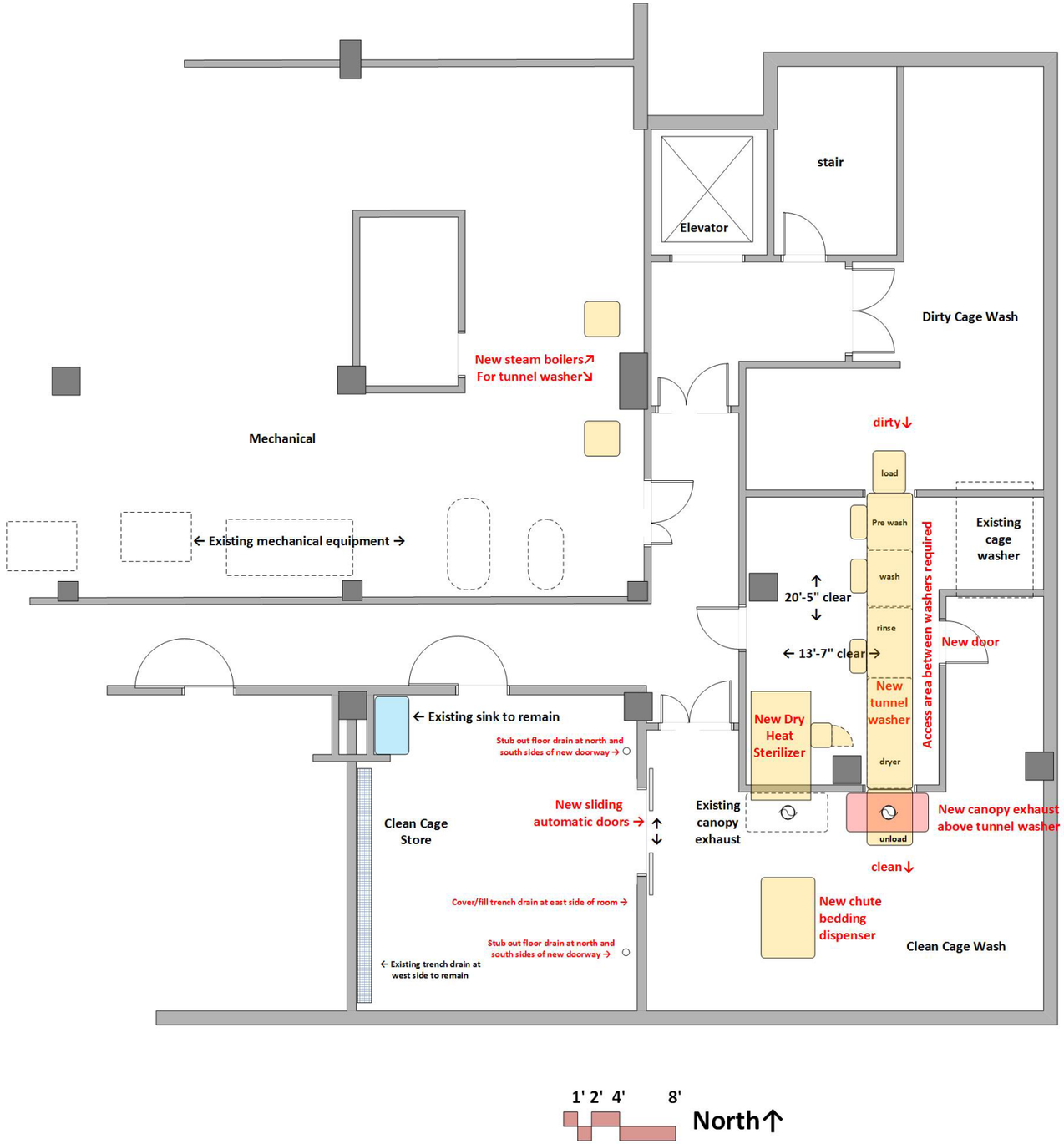
BASEMENT

Existing



← Area of Renovation
~2600 s.f. assignable plus MEP equipment in Mech Room

1' 2' 4' 8'
North ↑



BASEMENT

Proposed Renovation
Scheme A

ARCHITECTURAL
Occupancy: B
Floor: patch/repair existing as required
Walls: patch/repair existing as required-
provide heat attenuation at walls and floor near dry heat autoclave
Ceiling: patch/repair existing as required
Doors: New sliding doors at Clean Cage Store; all other doors to remain
Vermin proof: all penetrations to rooms sealed
Sound attenuation: NC 45 or less;
Security: card key access

STRUCTURAL
Existing to remain

MECHANICAL
Temperature: 70 deg F +/- 2 deg F
Humidity: 30-70% relative
100% exhaust; Air changes: 10 air changes/hour plus exhaust for ventilated cage racks
Air change rate may be higher due to equipment heat gain
Pressure: Negative
Exhaust required above dry heat sterilizer

PLUMBING
Hot/Cold water at tunnel washer
Steam at tunnel washer
Fill trench drain at east side of Clean Cage Store Room- stub out floor drain at north and south sides of new sliding door

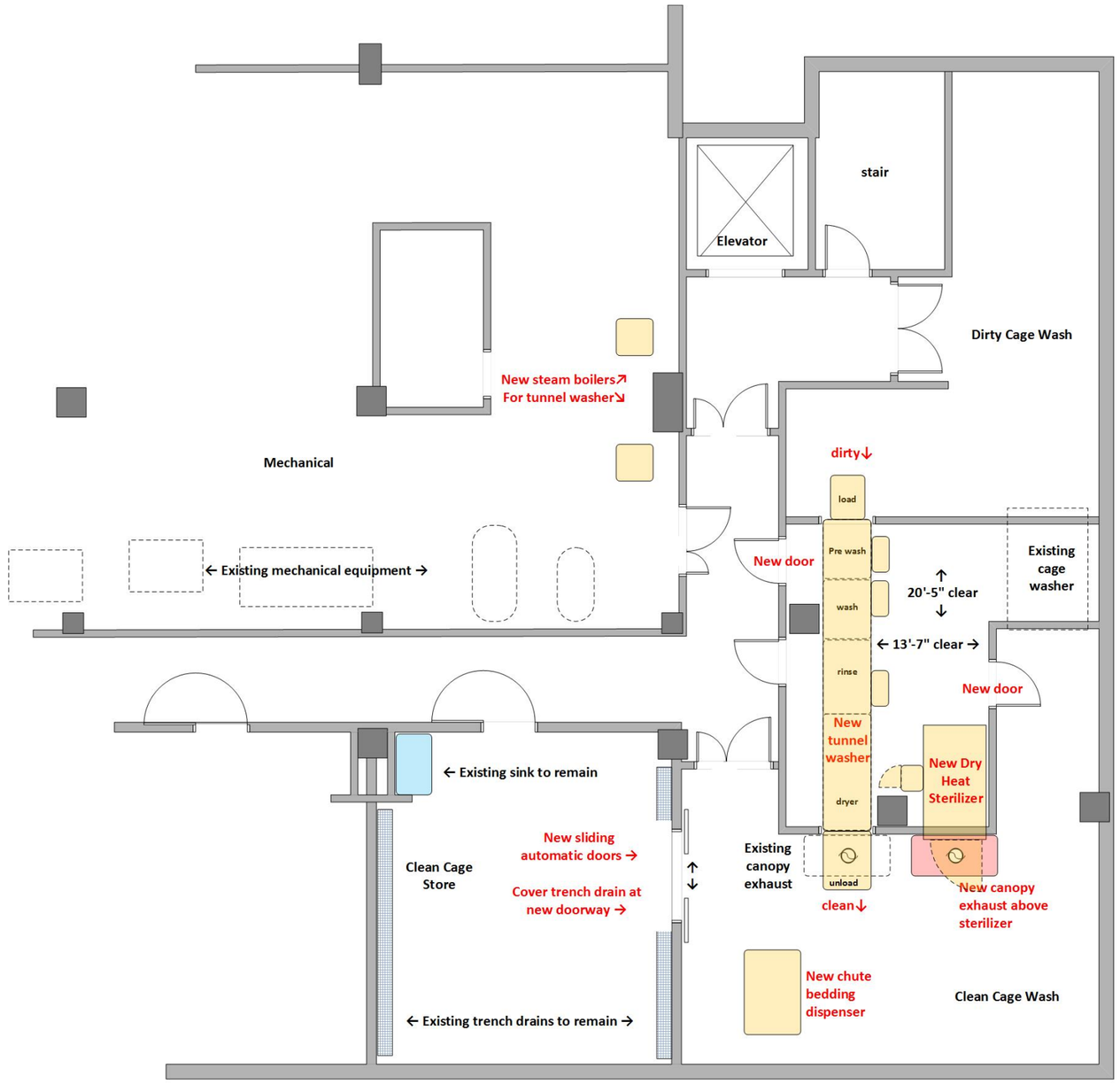
ELECTRICAL
115v20a1ph outlets
208v/480v as required by tunnel washer manufacturer
480v/3ph/95amp for dry heat sterilizer
Standby power- all MEP systems on emergency power
New emergency generator required
Lighting: existing to remain

CONTRACTOR FURNISHED EQUIPMENT
Tunnel washer
Chute bedding dispenser
Canopy exhaust above tunnel washer
Steam boilers in mechanical room to serve tunnel washer

UNIVERSITY FURNISHED EQUIPMENT
None

BASEMENT

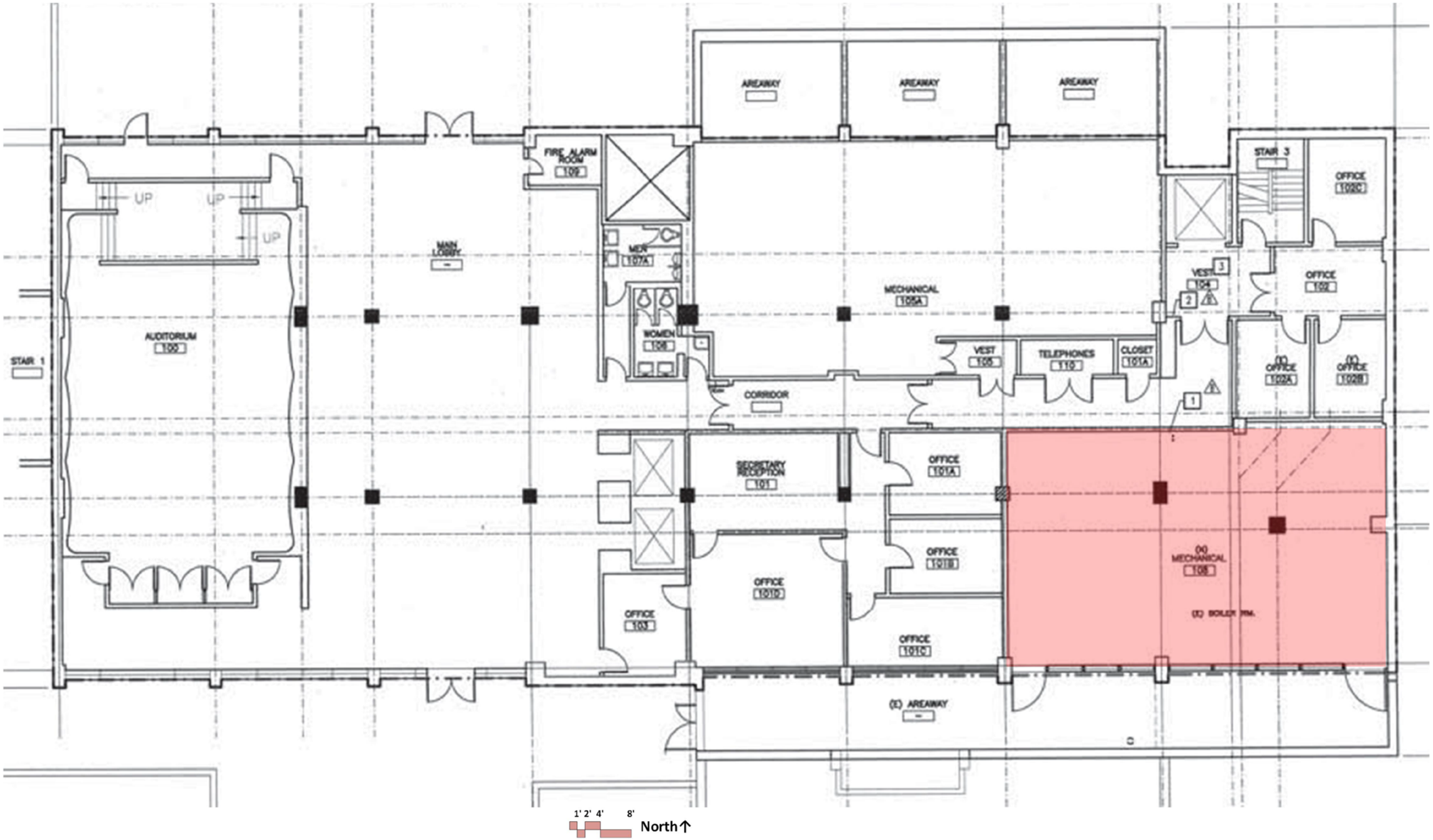
Proposed Renovation
Scheme B



Similar to scheme A, but reverses location of dry sterilizer and tunnel washer. This scheme requires a new door at northwest corner of tunnel washer room.

LEVEL 1

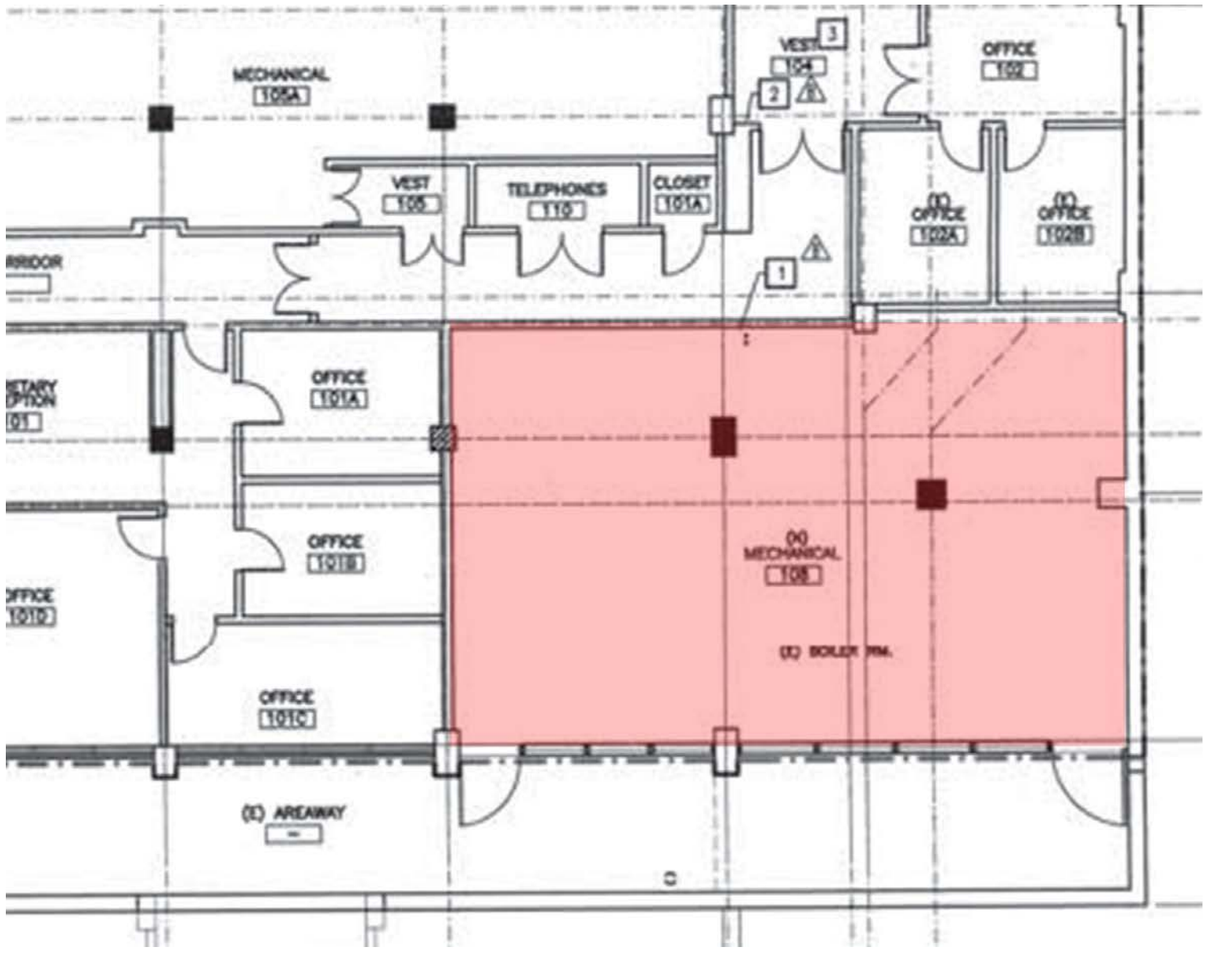
Existing



← Area of Renovation
~30' x 50'
~1500 s.f.

LEVEL 1

Proposed Renovation



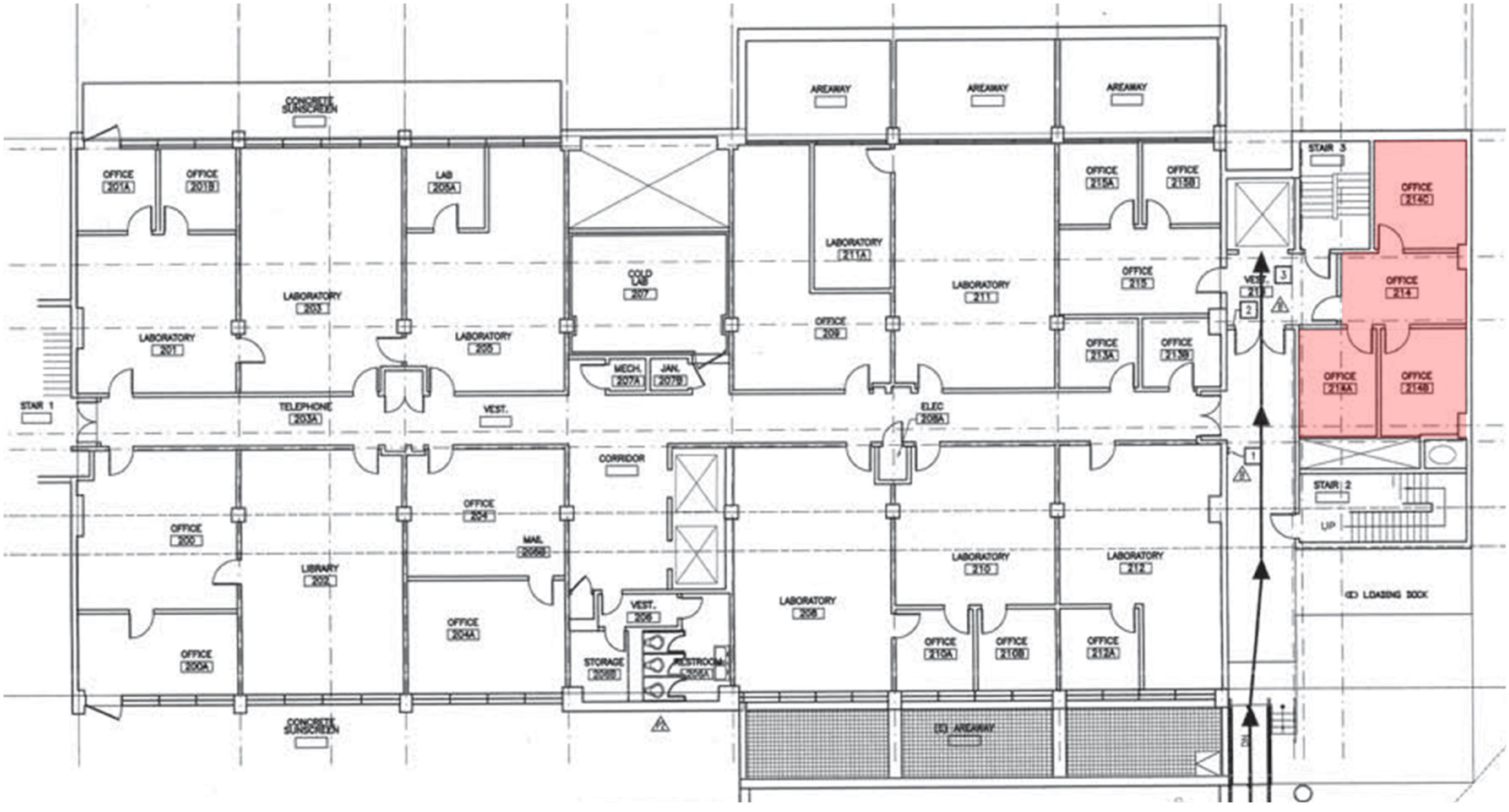
← Area of Renovation
~30' x 50'
~1500 s.f.

Level 1 mechanical room to be renovated as needed for upgrade of MEP systems on floors above and below.

Piping, ducting, and/or conduit may extend between floors above and basement below.

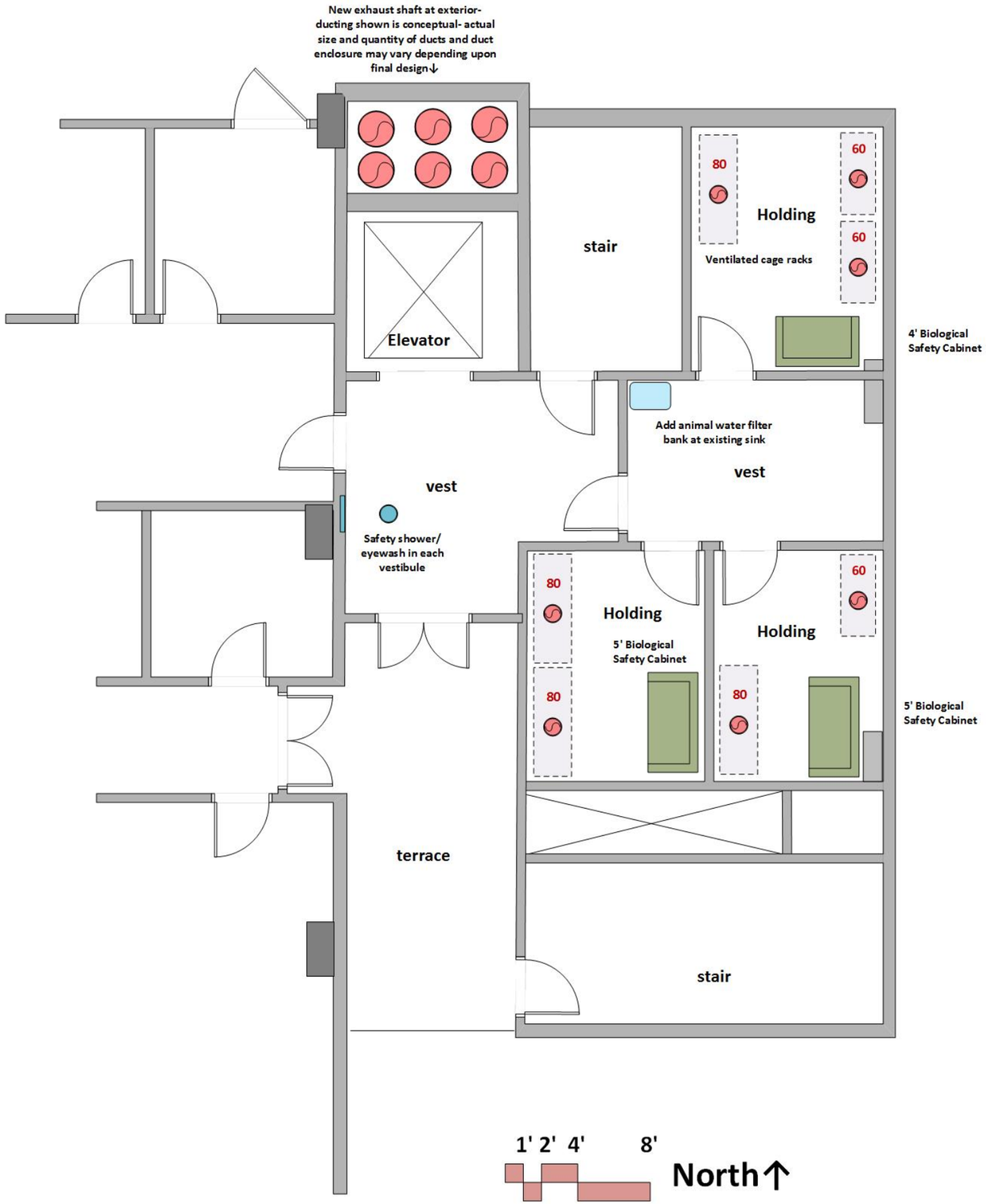
LEVEL 2

Existing



← Area of Renovation
~600 s.f.

1' 2' 4' 8'
North ↑



LEVEL 2

Proposed Renovation

ARCHITECTURAL

Occupancy: B
Floor: methyl methacrylate with integral coved base
Walls: metal stud with concrete backer board with fiberglass finish & epoxy paint
Soundproofing in holding room walls
Aluminum wall guards at corridor
Ceiling: waterproof gypsum board with fiberglass finish and epoxy paint at 10'
no access panels inside holding rooms and procedure rooms; Limit ceiling access panels to corridor
Doors: 3'-6"x8'-0" with red glass view window
Vermin proof: all penetrations to rooms sealed
Sound attenuation: NC 35 or less; sound insulation in walls and above ceiling.
Security: card key access

STRUCTURAL

Existing to remain

MECHANICAL

Temperature: 70 deg F +/- 2 deg F
Humidity: 30-70% relative
100% exhaust; Air changes: 10 air changes/hour plus exhaust for ventilated cage racks
Air change rate may be higher due to equipment heat gain
Pressure: Negative or positive depending upon use
Controls: BMS environmental monitoring for temperature, humidity, pressure, and lighting; with digital display at each holding room
Provide air exhaust connections at ceiling for ventilated cage racks

PLUMBING

Domestic tepid water at safety shower/eyewash in vestibule
Floor drain at safety shower/eyewash in vestibule
Animal watering system- filter bank at existing sink in vestibule, run watering lines to adjacent holding rooms
Provide centrally piped 0_2 and CO_2 if available from building system; if not provide cylinder tanks for 0_2 and CO_2 in Procedure room

ELECTRICAL

115v20a1ph outlets at walls and ceilings (cage racks)
Standby power- all MEP systems on emergency power
New emergency generator required
Hardwire and wireless data
Lighting: recessed, sealed LED at 600 LUX with circadian lighting controls (intermatic timers at each room)
300 LUX unoccupied with manual switch for 600 LUX
White light for day cycle, red light for night cycle
Fire alarm: red strobe light

CONTRACTOR FURNISHED EQUIPMENT

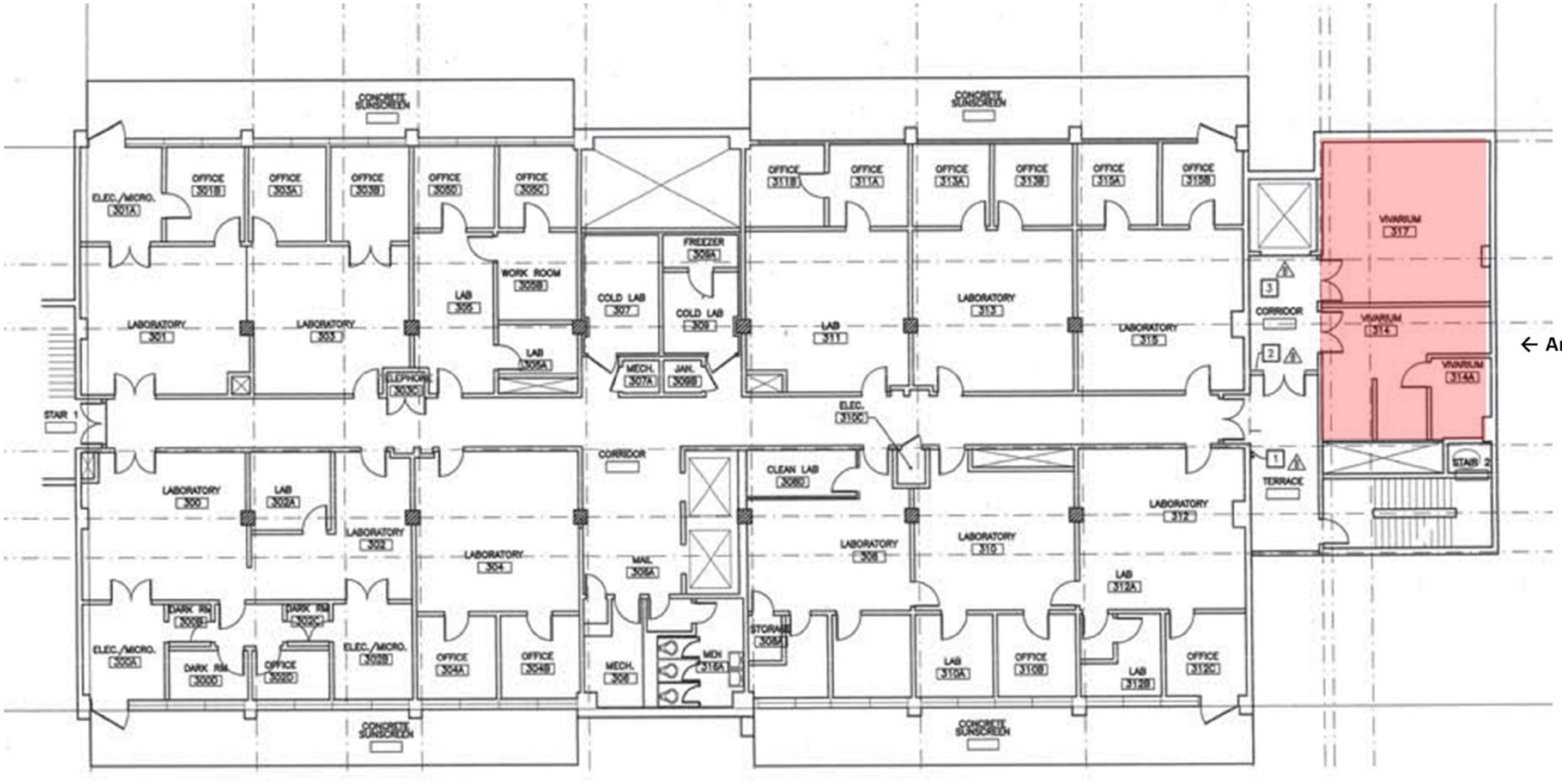
Safety shower/eyewash in vestibule
Stainless steel casework and sink in Procedure Room
Mobile lab bench in Procedure Room
Cylinder restraints

UNIVERSITY FURNISHED EQUIPMENT

Ventilated cage racks- Allentown standard
Animal changing station (acs)
Biological safety cabinets
CO2 and O2 cylinders

LEVEL 3

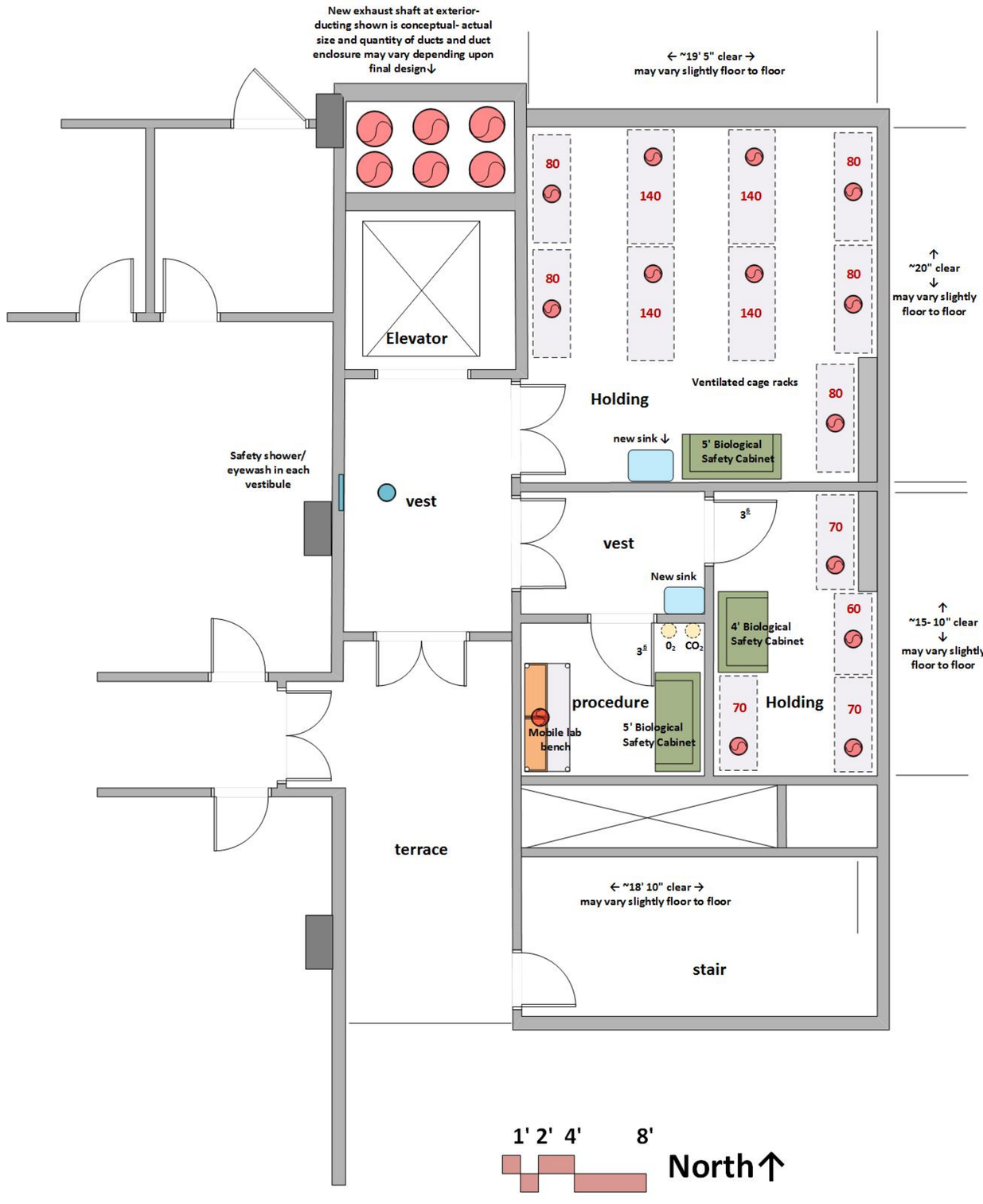
Existing



← Area of Renovation
~20' x 37'
~740 s.f.

1' 2' 4' 8'

North ↑



LEVEL 3

Proposed Renovation

Levels 7, 6, 5, 4, and 3 similar

ARCHITECTURAL

Occupancy: B
Floor: methyl methacrylate with integral coved base
Walls: metal stud with concrete backer board with fiberglass finish & epoxy paint
Soundproofing in holding room walls
Aluminum wall guards at corridor
Ceiling: waterproof gypsum board with fiberglass finish and epoxy paint at 10'
no access panels inside holding rooms and procedure rooms; Limit ceiling access panels to corridor
Doors: 3'-6"x8'-0" with red glass view window
Vermin proof: all penetrations to rooms sealed
Sound attenuation: NC 35 or less; sound insulation in walls and above ceiling.
Security: card key access

STRUCTURAL

Existing to remain

MECHANICAL

Temperature: 70 deg F +/- 2 deg F
Humidity: 30-70% relative
100% exhaust; Air changes: 10 air changes/hour plus exhaust for ventilated cage racks
Air change rate may be higher due to equipment heat gain
Pressure: Negative or positive depending upon use
Controls: BMS environmental monitoring for temperature, humidity, pressure, and lighting; with digital display at each holding room
Provide air exhaust connections at ceiling for ventilated cage racks

PLUMBING

Domestic tepid water at safety shower/eyewash in vestibule
Floor drain at safety shower/eyewash in vestibule
Animal watering system
Provide centrally piped O_2 and CO_2 if available from building system; if not provide cylinder tanks for O_2 and CO_2 in Procedure room

ELECTRICAL

115v20a1ph outlets at walls and ceilings (cage racks)
Standby power- all MEP systems on emergency power
New emergency generator required
Hardwire and wireless data
Lighting: recessed, sealed LED at 600 LUX with circadian lighting controls (intermatic timers at each room)
300 LUX unoccupied with manual switch for 600 LUX
White light for day cycle, red light for night cycle
Fire alarm: red strobe light

CONTRACTOR FURNISHED EQUIPMENT

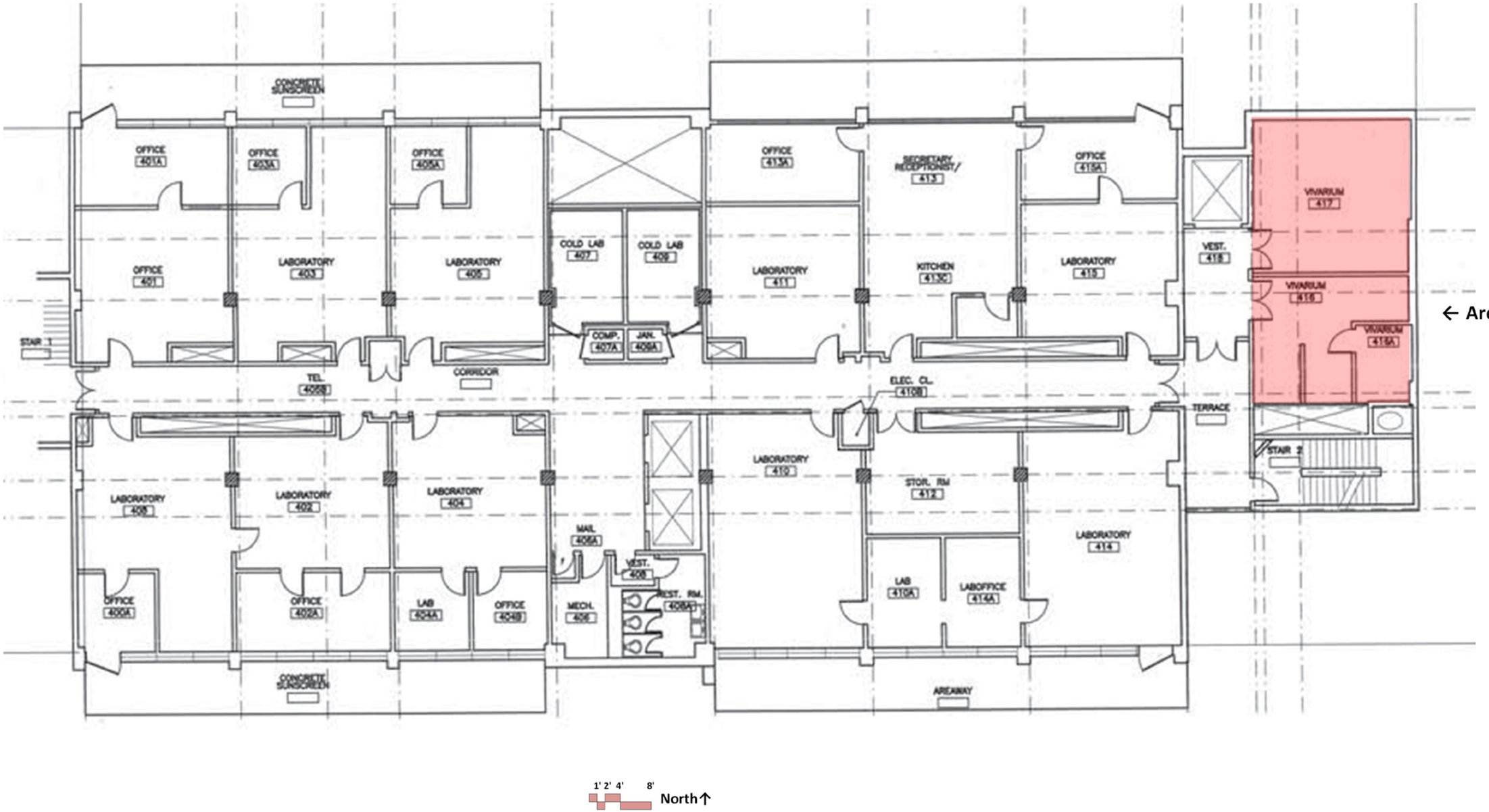
Safety shower/eyewash in vestibule
Stainless steel casework and sink in Procedure Room
Mobile lab bench in Procedure Room
Cylinder restraints

UNIVERSITY FURNISHED EQUIPMENT

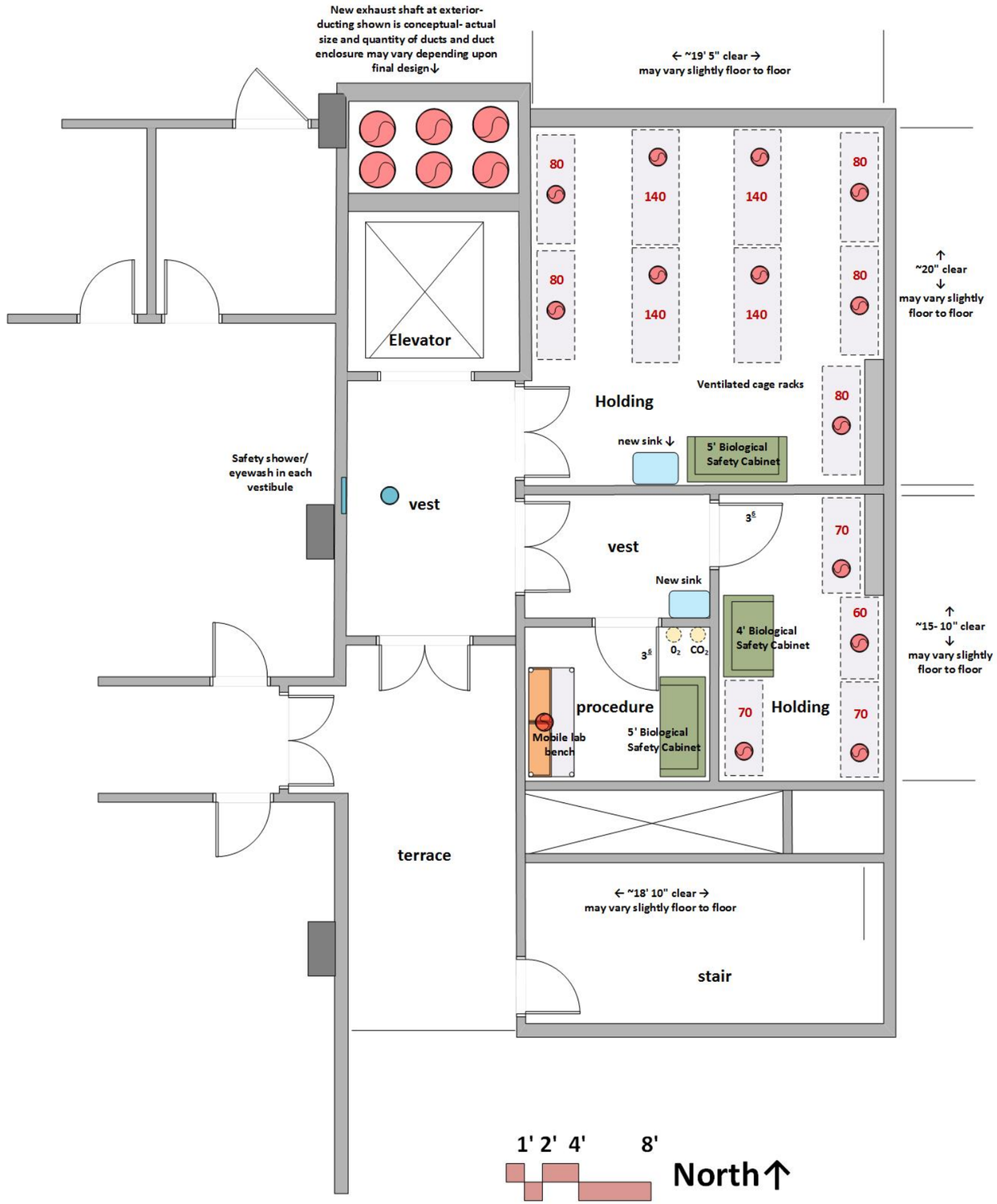
Ventilated cage racks- Allentown standard
Animal changing station (acs)
Biological safety cabinets
CO2 and O2 cylinders

LEVEL 4

Existing



← Area of Renovation
~20' x 37'
~740 s.f.



LEVEL 4

Proposed Renovation

Levels 7, 6, 5, 4, and 3 similar

ARCHITECTURAL

Occupancy: B
Floor: methyl methacrylate with integral coved base
Walls: metal stud with concrete backer board with fiberglass finish & epoxy paint
Soundproofing in holding room walls
Aluminum wall guards at corridor
Ceiling: waterproof gypsum board with fiberglass finish and epoxy paint at 10'
no access panels inside holding rooms and procedure rooms; Limit ceiling access panels to corridor
Doors: 3'-6"x8'-0" with red glass view window
Vermin proof: all penetrations to rooms sealed
Sound attenuation: NC 35 or less; sound insulation in walls and above ceiling.
Security: card key access

STRUCTURAL

Existing to remain

MECHANICAL

Temperature: 70 deg F +/- 2 deg F
Humidity: 30-70% relative
100% exhaust; Air changes: 10 air changes/hour plus exhaust for ventilated cage racks
Air change rate may be higher due to equipment heat gain
Pressure: Negative or positive depending upon use
Controls: BMS environmental monitoring for temperature, humidity, pressure, and lighting; with digital display at each holding room
Provide air exhaust connections at ceiling for ventilated cage racks

PLUMBING

Domestic tepid water at safety shower/eyewash in vestibule
Floor drain at safety shower/eyewash in vestibule
Animal watering system
Provide centrally piped 0_2 and CO_2 if available from building system; if not provide cylinder tanks for 0_2 and CO_2 in Procedure room

ELECTRICAL

115v20a1ph outlets at walls and ceilings (cage racks)
Standby power- all MEP systems on emergency power
New emergency generator required
Hardwire and wireless data
Lighting: recessed, sealed LED at 600 LUX with circadian lighting controls (intermatic timers at each room)
300 LUX unoccupied with manual switch for 600 LUX
White light for day cycle, red light for night cycle
Fire alarm: red strobe light

CONTRACTOR FURNISHED EQUIPMENT

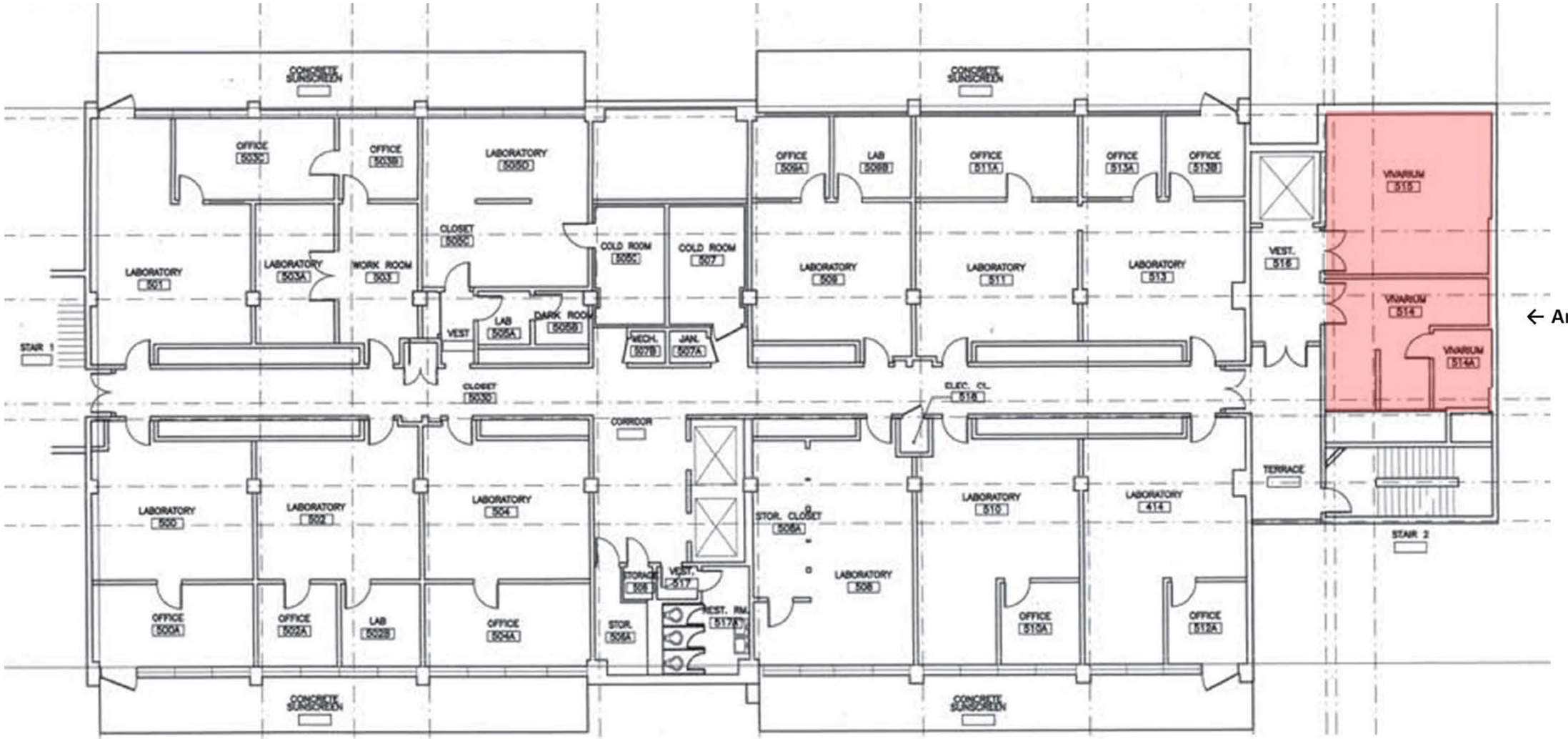
Safety shower/eyewash in vestibule
Stainless steel casework and sink in Procedure Room
Mobile lab bench in Procedure Room
Cylinder restraint

UNIVERSITY FURNISHED EQUIPMENT

Ventilated cage racks- Allentown standard
Animal changing station (acs)
Biological safety cabinets
CO2 and O2 cylinders

LEVEL 5

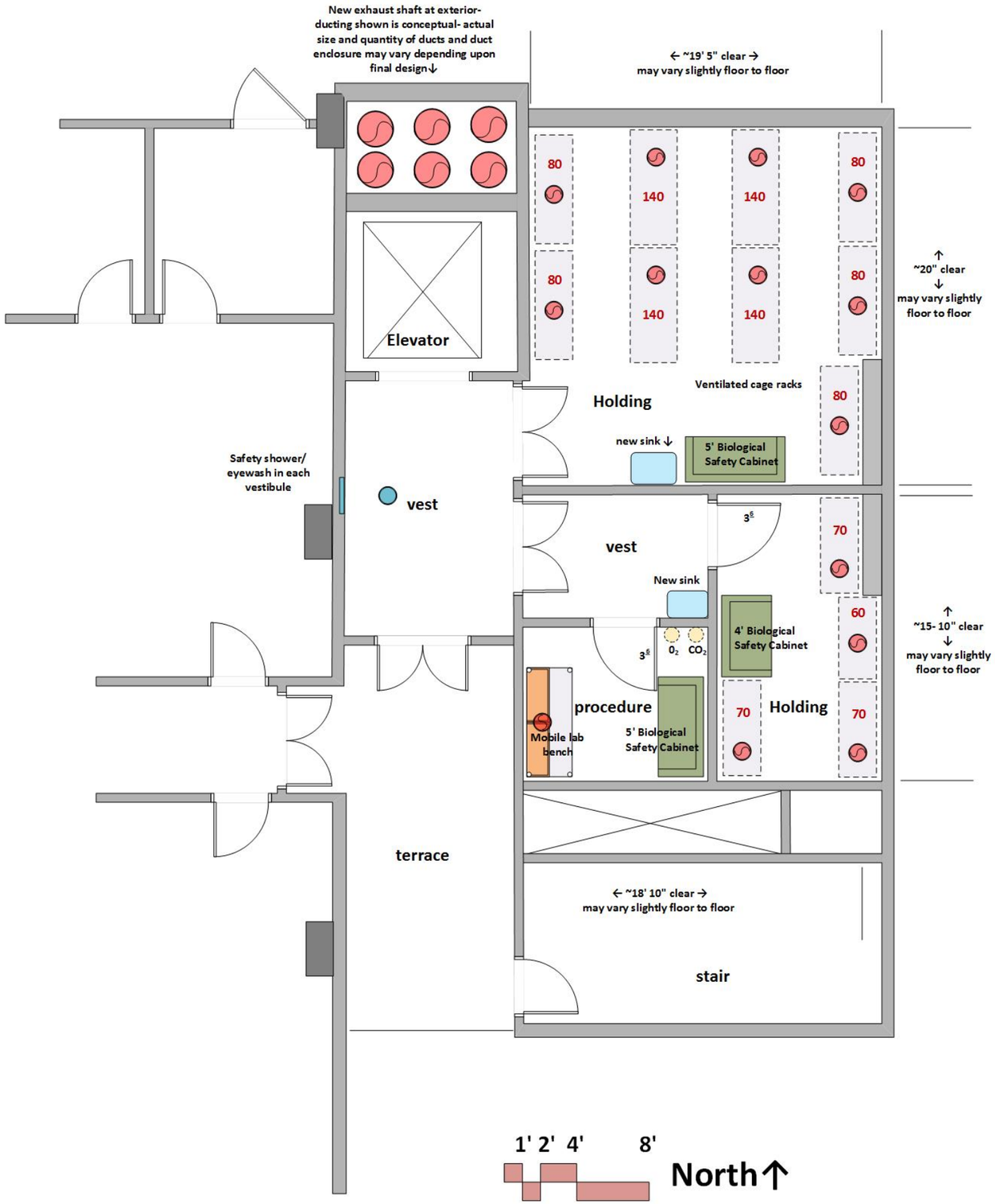
Existing



← Area of Renovation
~20' x 37'
~740 s.f.

1' 2' 4' 8'

North ↑



LEVEL 5

Proposed Renovation

Levels 7, 6, 5, 4, and 3 similar

ARCHITECTURAL

Occupancy: B
Floor: methyl methacrylate with integral coved base
Walls: metal stud with concrete backer board with fiberglass finish & epoxy paint
Soundproofing in holding room walls
Aluminum wall guards at corridor
Ceiling: waterproof gypsum board with fiberglass finish and epoxy paint at 10'
no access panels inside holding rooms and procedure rooms; Limit ceiling access panels to corridor
Doors: 3'-6"x8'-0" with red glass view window
Vermin proof: all penetrations to rooms sealed
Sound attenuation: NC 35 or less; sound insulation in walls and above ceiling.
Security: card key access

STRUCTURAL

Existing to remain

MECHANICAL

Temperature: 70 deg F +/- 2 deg F
Humidity: 30-70% relative
100% exhaust; Air changes: 10 air changes/hour plus exhaust for ventilated cage racks
Air change rate may be higher due to equipment heat gain
Pressure: Negative or positive depending upon use
Controls: BMS environmental monitoring for temperature, humidity, pressure, and lighting; with digital display at each holding room
Provide air exhaust connections at ceiling for ventilated cage racks

PLUMBING

Domestic tepid water at safety shower/eyewash in vestibule
Floor drain at safety shower/eyewash in vestibule
Animal watering system
Provide centrally piped 0_2 and CO_2 if available from building system; if not provide cylinder tanks for 0_2 and CO_2 in Procedure room

ELECTRICAL

115v20a1ph outlets at walls and ceilings (cage racks)
Standby power- all MEP systems on emergency power
New emergency generator required
Hardwire and wireless data
Lighting: recessed, sealed LED at 600 LUX with circadian lighting controls (intermatic timers at each room)
300 LUX unoccupied with manual switch for 600 LUX
White light for day cycle, red light for night cycle
Fire alarm: red strobe light

CONTRACTOR FURNISHED EQUIPMENT

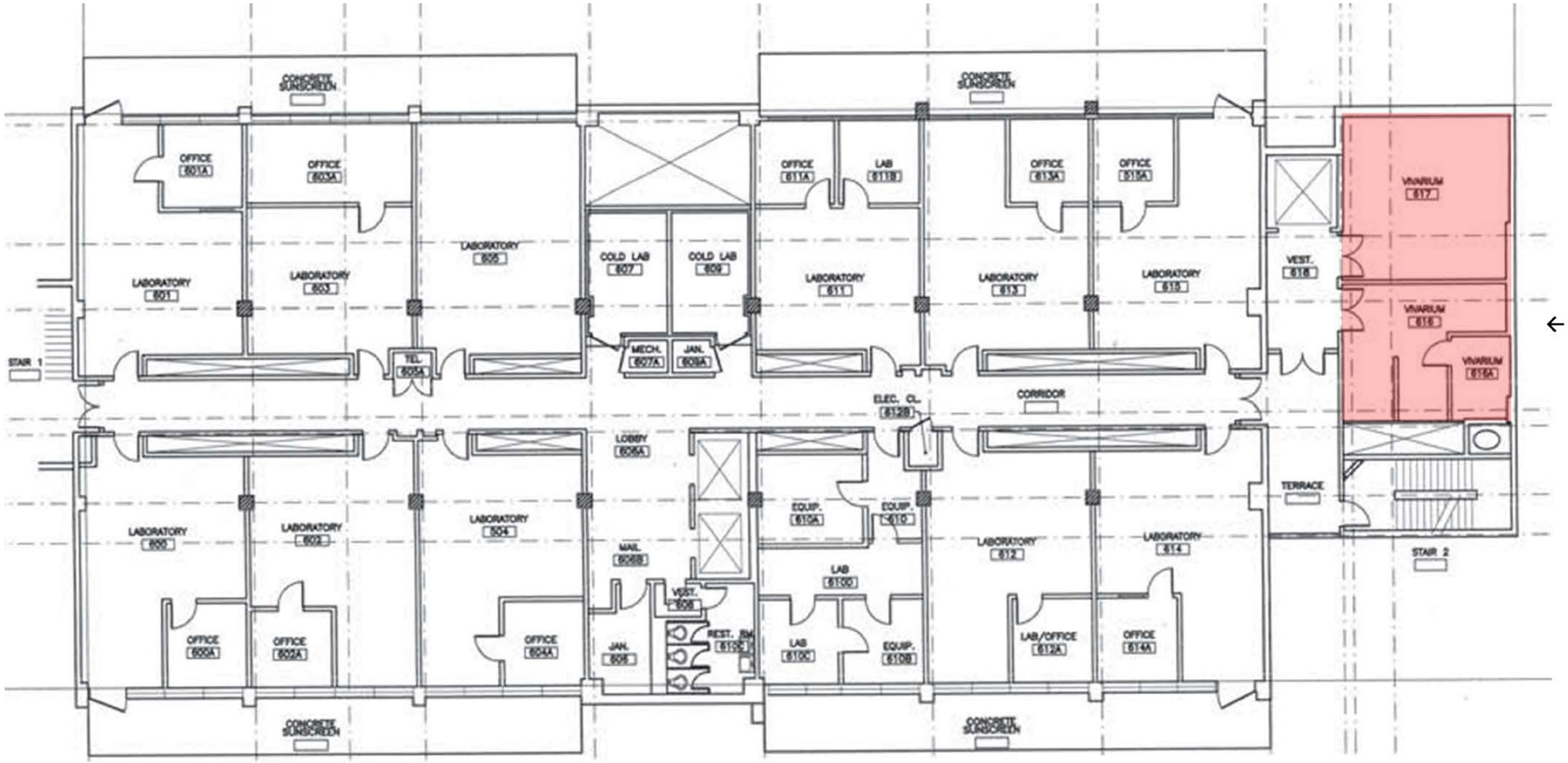
Safety shower/eyewash in vestibule
Stainless steel casework and sink in Procedure Room
Mobile lab bench in Procedure Room
Cylinder restraints

UNIVERSITY FURNISHED EQUIPMENT

Ventilated cage racks- Allentown standard
Animal changing station (acs)
Biological safety cabinets
CO2 and O2 cylinders

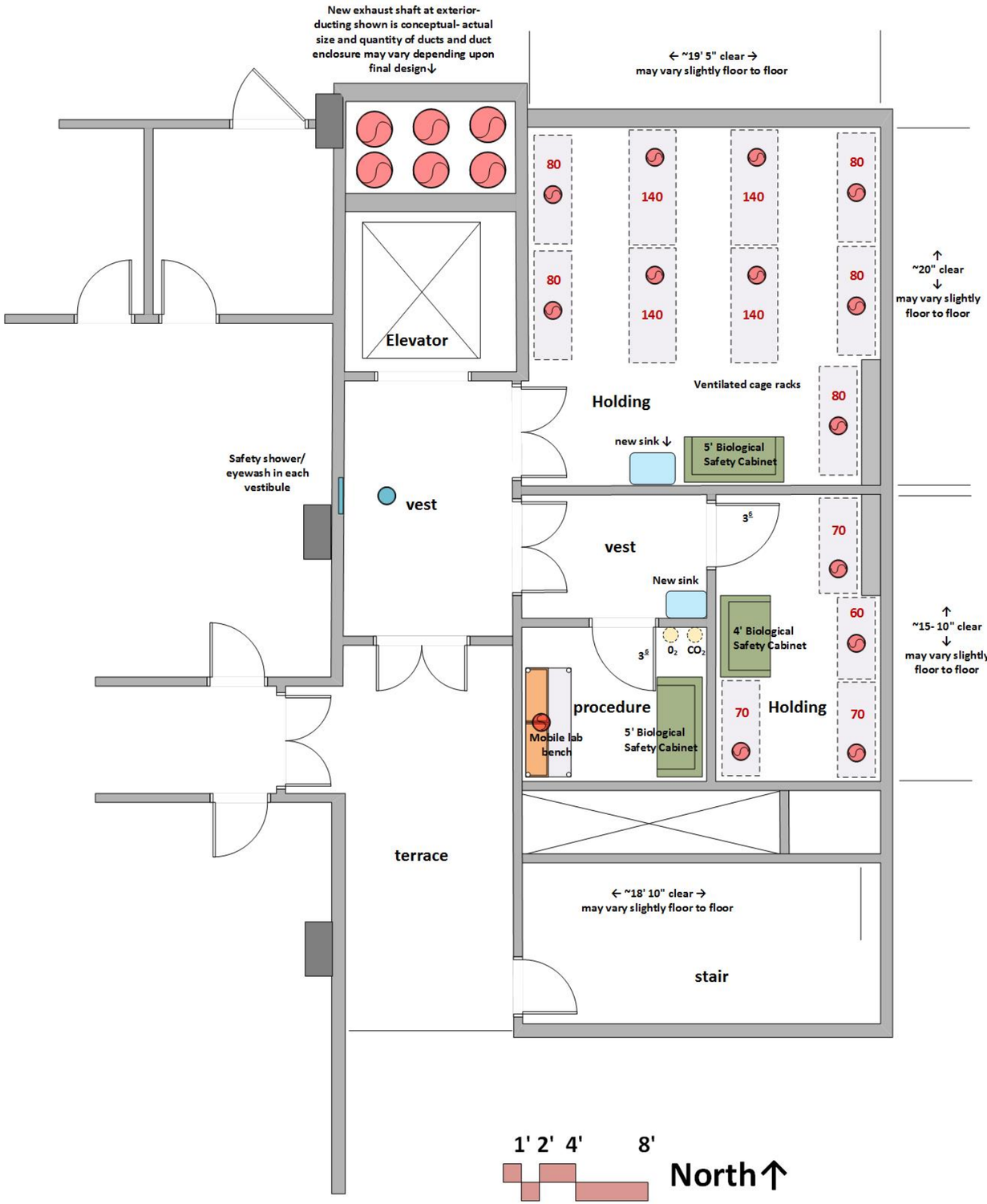
LEVEL 6

Existing



← Area of Renovation
~20' x 37'
~740 s.f.

1' 2' 4' 8'
North ↑



LEVEL 6

Proposed Renovation

Levels 7, 6, 5, 4, and 3 similar

ARCHITECTURAL

Occupancy: B
Floor: methyl methacrylate with integral coved base
Walls: metal stud with concrete backer board with fiberglass finish & epoxy paint
Soundproofing in holding room walls
Aluminum wall guards at corridor
Ceiling: waterproof gypsum board with fiberglass finish and epoxy paint at 10'
no access panels inside holding rooms and procedure rooms; Limit ceiling access panels to corridor
Doors: 3'-6"x8'-0" with red glass view window
Vermin proof: all penetrations to rooms sealed
Sound attenuation: NC 35 or less; sound insulation in walls and above ceiling.
Security: card key access

STRUCTURAL

Existing to remain

MECHANICAL

Temperature: 70 deg F +/- 2 deg F
Humidity: 30-70% relative
100% exhaust; Air changes: 10 air changes/hour plus exhaust for ventilated cage racks
Air change rate may be higher due to equipment heat gain
Pressure: Negative or positive depending upon use
Controls: BMS environmental monitoring for temperature, humidity, pressure, and lighting; with digital display at each holding room
Provide air exhaust connections at ceiling for ventilated cage racks

PLUMBING

Domestic tepid water at safety shower/eyewash in vestibule
Floor drain at safety shower/eyewash in vestibule
Animal watering system
Provide centrally piped O_2 and CO_2 if available from building system; if not provide cylinder tanks for O_2 and CO_2 in Procedure room

ELECTRICAL

115v20a1ph outlets at walls and ceilings (cage racks)
Standby power- all MEP systems on emergency power
New emergency generator required
Hardwire and wireless data
Lighting: recessed, sealed LED at 600 LUX with circadian lighting controls (intermatic timers at each room)
300 LUX unoccupied with manual switch for 600 LUX
White light for day cycle, red light for night cycle
Fire alarm: red strobe light

CONTRACTOR FURNISHED EQUIPMENT

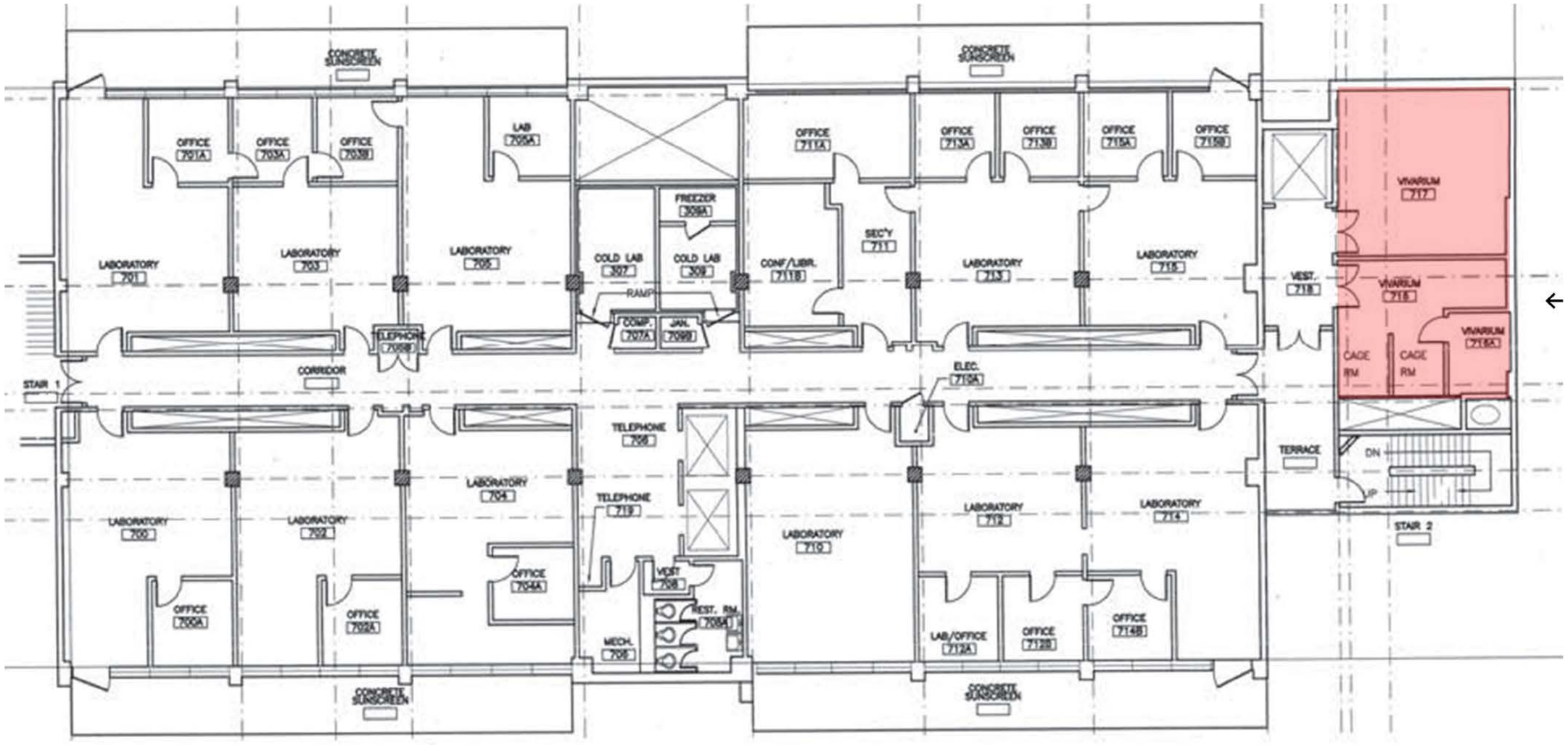
Safety shower/eyewash in vestibule
Stainless steel casework and sink in Procedure Room
Mobile lab bench in Procedure Room
Cylinder restraints

UNIVERSITY FURNISHED EQUIPMENT

Ventilated cage racks
Biological safety cabinets
CO2 and O2 cylinders

LEVEL 7

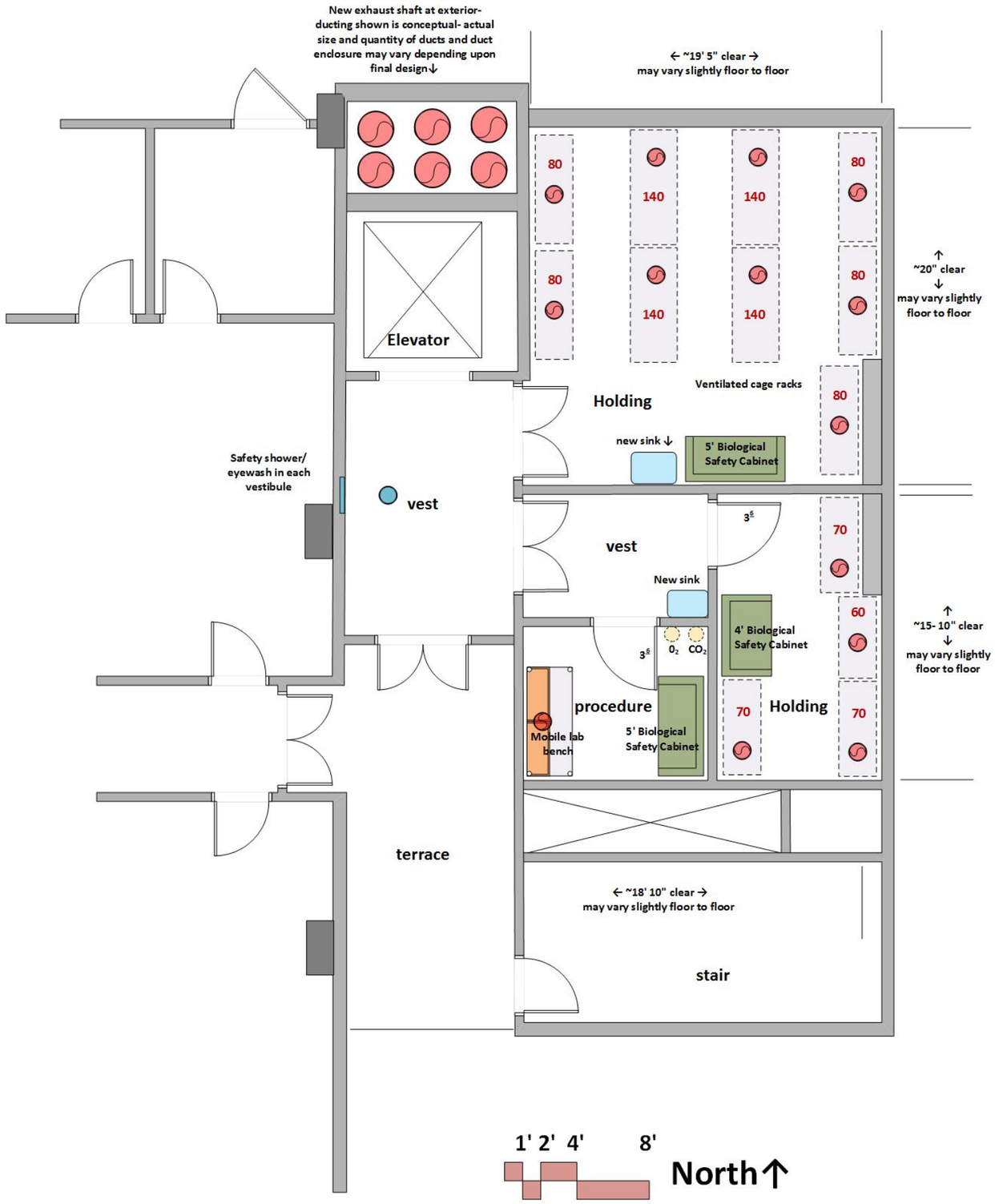
Existing



← Area of Renovation
~20' x 37'
~740 s.f.

1' 2' 4' 8'

North ↑



LEVEL 7

Proposed Renovation

Levels 7, 6, 5, 4, and 3 similar

ARCHITECTURAL

Occupancy: B
Floor: methyl methacrylate with integral coved base
Walls: metal stud with concrete backer board with fiberglass finish & epoxy paint
Soundproofing in holding room walls
Aluminum wall guards at corridor
Ceiling: waterproof gypsum board with fiberglass finish and epoxy paint at 10'
no access panels inside holding rooms and procedure rooms; Limit ceiling access panels to corridor
Doors: 3'-6"x8'-0" with red glass view window
Vermin proof: all penetrations to rooms sealed
Sound attenuation: NC 35 or less; sound insulation in walls and above ceiling.
Security: card key access

STRUCTURAL

Existing to remain

MECHANICAL

Temperature: 70 deg F +/- 2 deg F
Humidity: 30-70% relative
100% exhaust; Air changes: 10 air changes/hour plus exhaust for ventilated cage racks
Air change rate may be higher due to equipment heat gain
Pressure: Negative or positive depending upon use
Controls: BMS environmental monitoring for temperature, humidity, pressure, and lighting; with digital display at each holding room
Provide air exhaust connections at ceiling for ventilated cage racks

PLUMBING

Domestic tepid water at safety shower/eyewash in vestibule
Floor drain at safety shower/eyewash in vestibule
Animal watering system
Provide centrally piped 0_2 and CO_2 if available from building system; if not provide cylinder tanks for 0_2 and CO_2 in Procedure room

ELECTRICAL

115v20a1ph outlets at walls and ceilings (cage racks)
Standby power- all MEP systems on emergency power
New emergency generator required
Hardwire and wireless data
Lighting: recessed, sealed LED at 600 LUX with circadian lighting controls (intermatic timers at each room)
300 LUX unoccupied with manual switch for 600 LUX
White light for day cycle, red light for night cycle
Fire alarm: red strobe light

CONTRACTOR FURNISHED EQUIPMENT

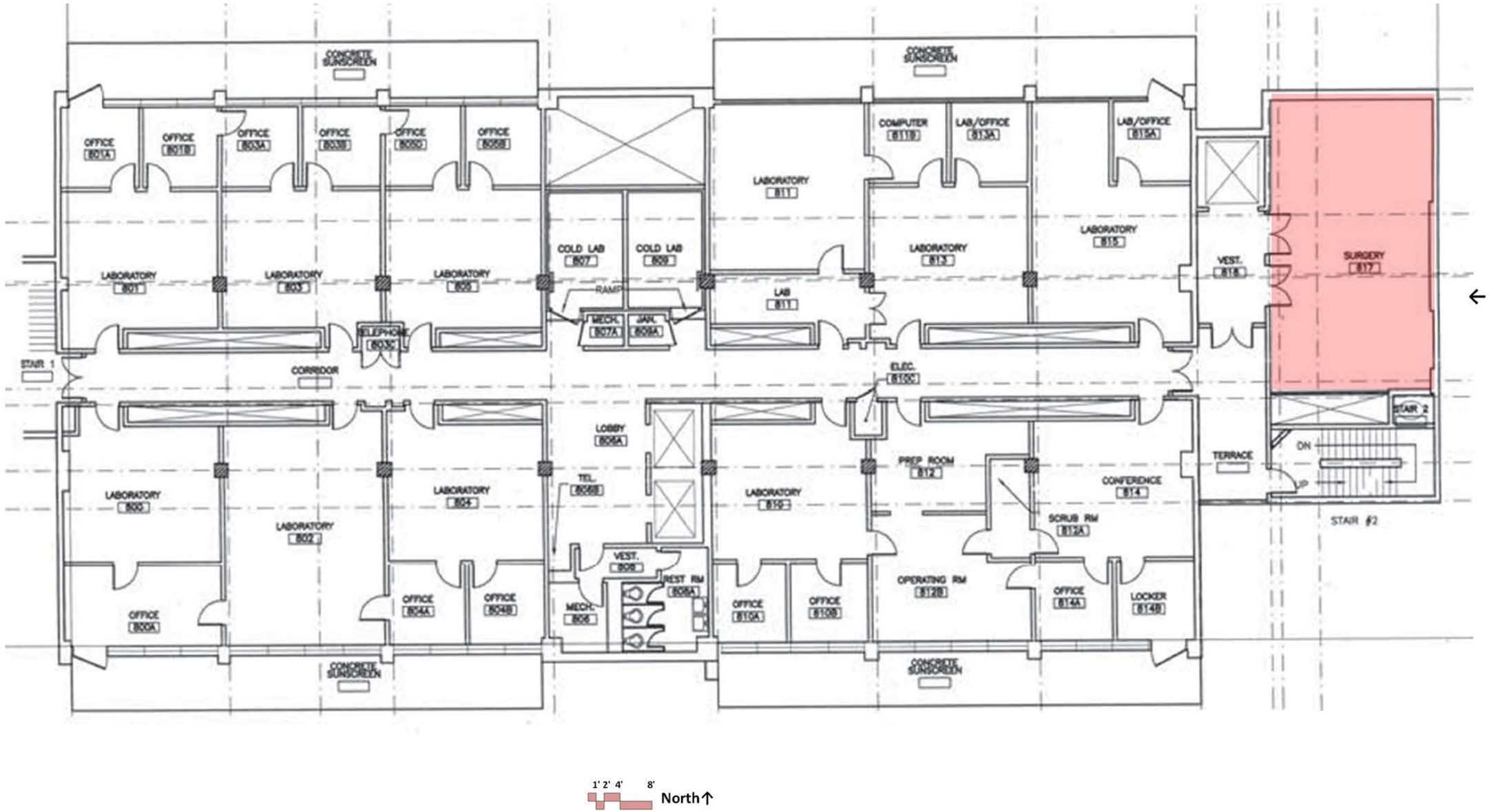
Safety shower/eyewash in vestibule
Stainless steel casework and sink in Procedure Room
Mobile lab bench in Procedure Room
Cylinder restraints

UNIVERSITY FURNISHED EQUIPMENT

Ventilated cage racks
Biological safety cabinets
CO2 and O2 cylinders

LEVEL 8

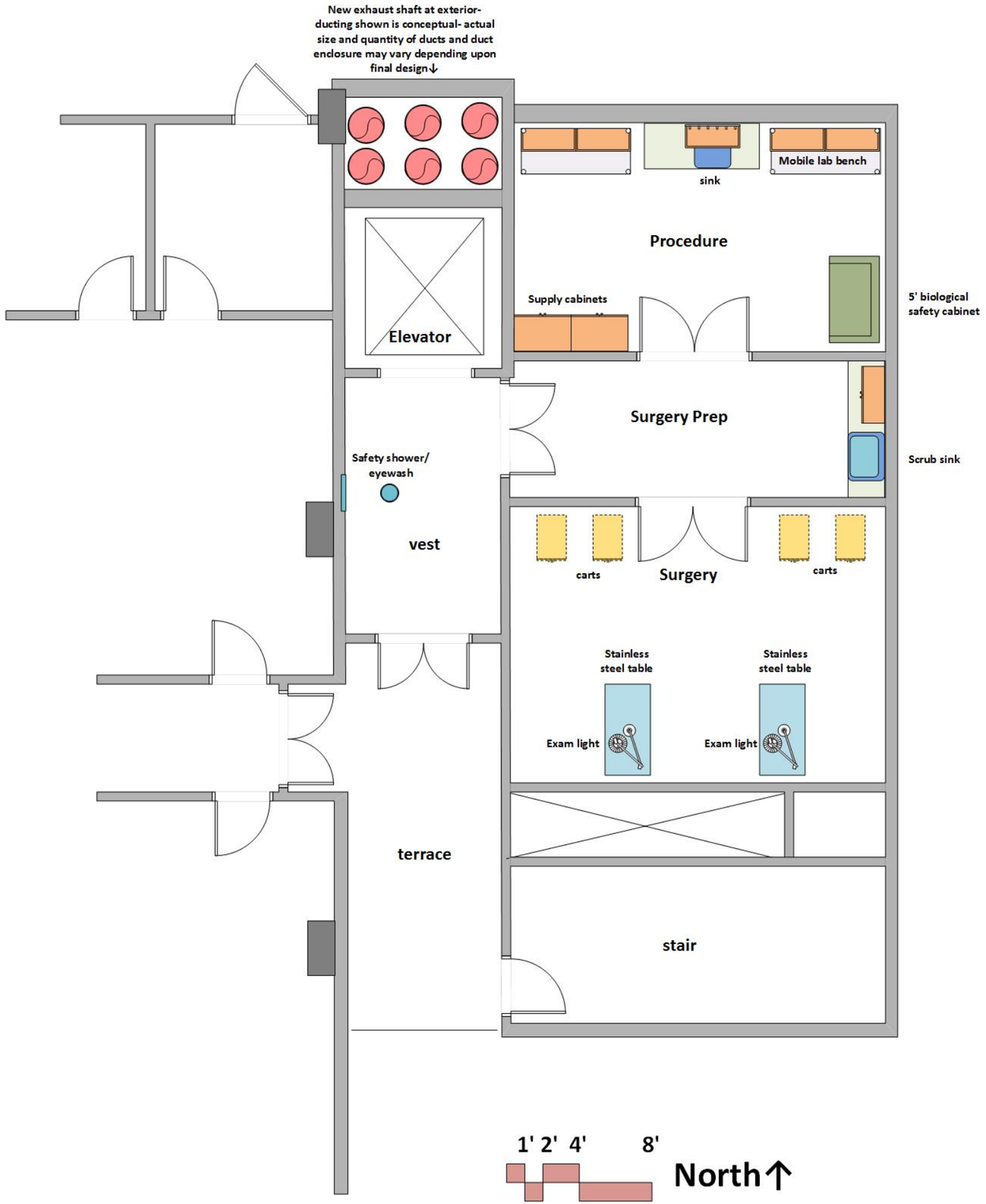
Existing



← Area of Renovation
~20' x 37'
~740 s.f.

1' 2' 4' 8'

North ↑



LEVEL 8

Proposed Renovation

New Surgery/Procedure Suite

ARCHITECTURAL

Occupancy: B
Floor: methyl methacrylate with integral coved base
Walls: metal stud with concrete backer board with fiberglass finish & epoxy paint
Soundproofing in holding room walls
Aluminum wall guards at corridor
Ceiling: waterproof gypsum board with fiberglass finish and epoxy paint at 10'
no access panels inside holding rooms and procedure rooms; Limit ceiling access panels to corridor
Doors: 3'-0"x8'-0"pair
Vermin proof: all penetrations to rooms sealed
Sound attenuation: NC 45 or less; sound insulation in walls and above ceiling.
Security: card key access

STRUCTURAL

Existing to remain

MECHANICAL

Temperature: 70 deg F +/- 2 deg F
Humidity: 30-70% relative
100% exhaust; Air changes: 10 air changes/hour
Air change rate may be higher due to equipment heat gain
Pressure: Positive at Surgery Room; Negative at Surgery Prep; Negative at Procedure

PLUMBING

Hot/Cold water at scrub sink
Domestic tepid water at safety shower/eyewash in vestibule
CO2 and O2 gas at surgery tables
Floor drain at safety shower/eyewash in vestibule

ELECTRICAL

115v20a1ph outlets at walls and ceilings (cage racks)
Standby power- all MEP systems on emergency power
New emergency generator required
Hardwire and wireless data
Lighting: recessed, sealed LED at 750 LUX with
Fire alarm: red strobe light

CONTRACTOR FURNISHED EQUIPMENT

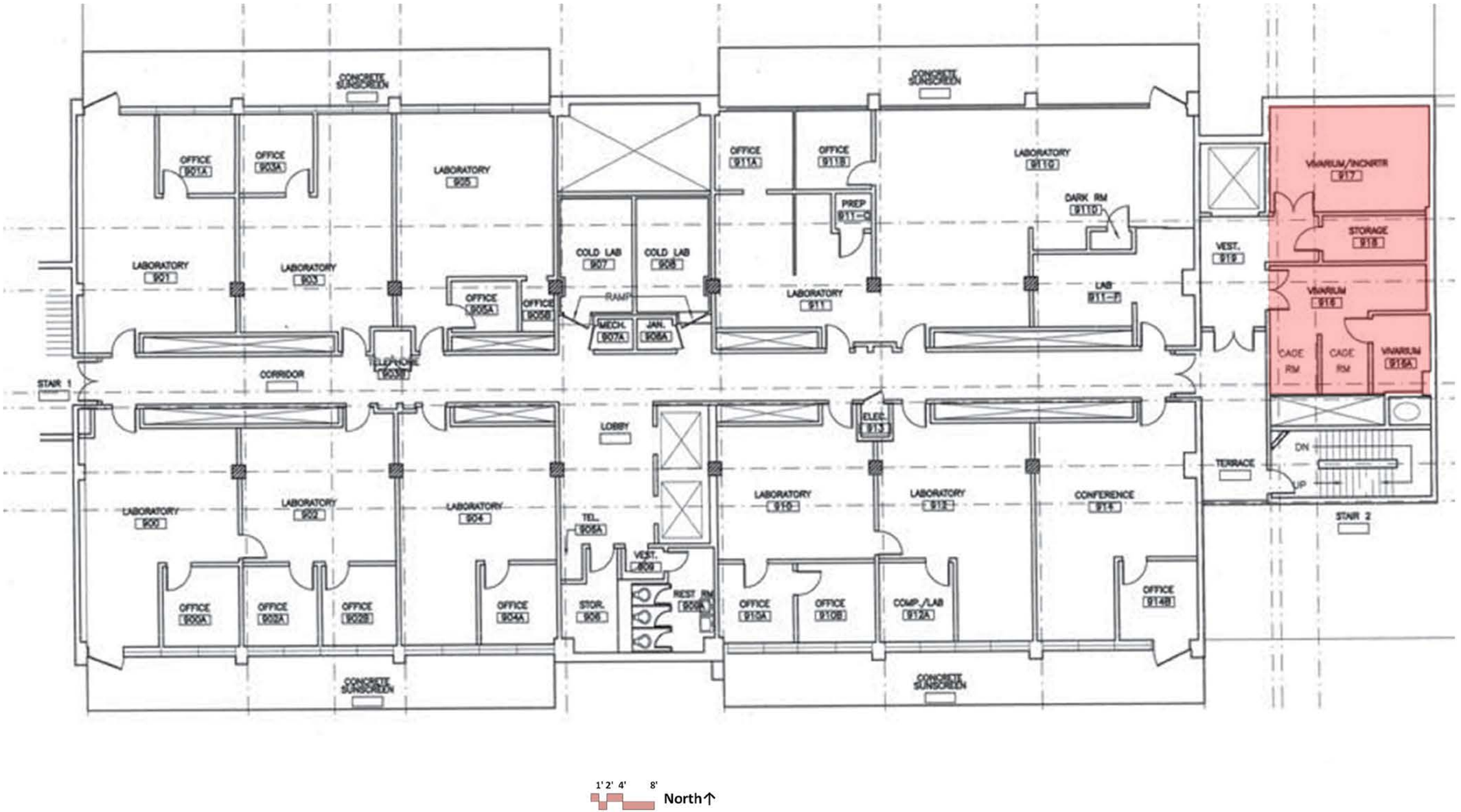
Scrub sink
Stainless steel casework- sinks, tops, cabinets, tables
Biological Safety Cabinet- Class II Type C1 with thimble exhaust
Exam lights
Safety shower/eyewash in vestibule

UNIVERSITY FURNISHED EQUIPMENT

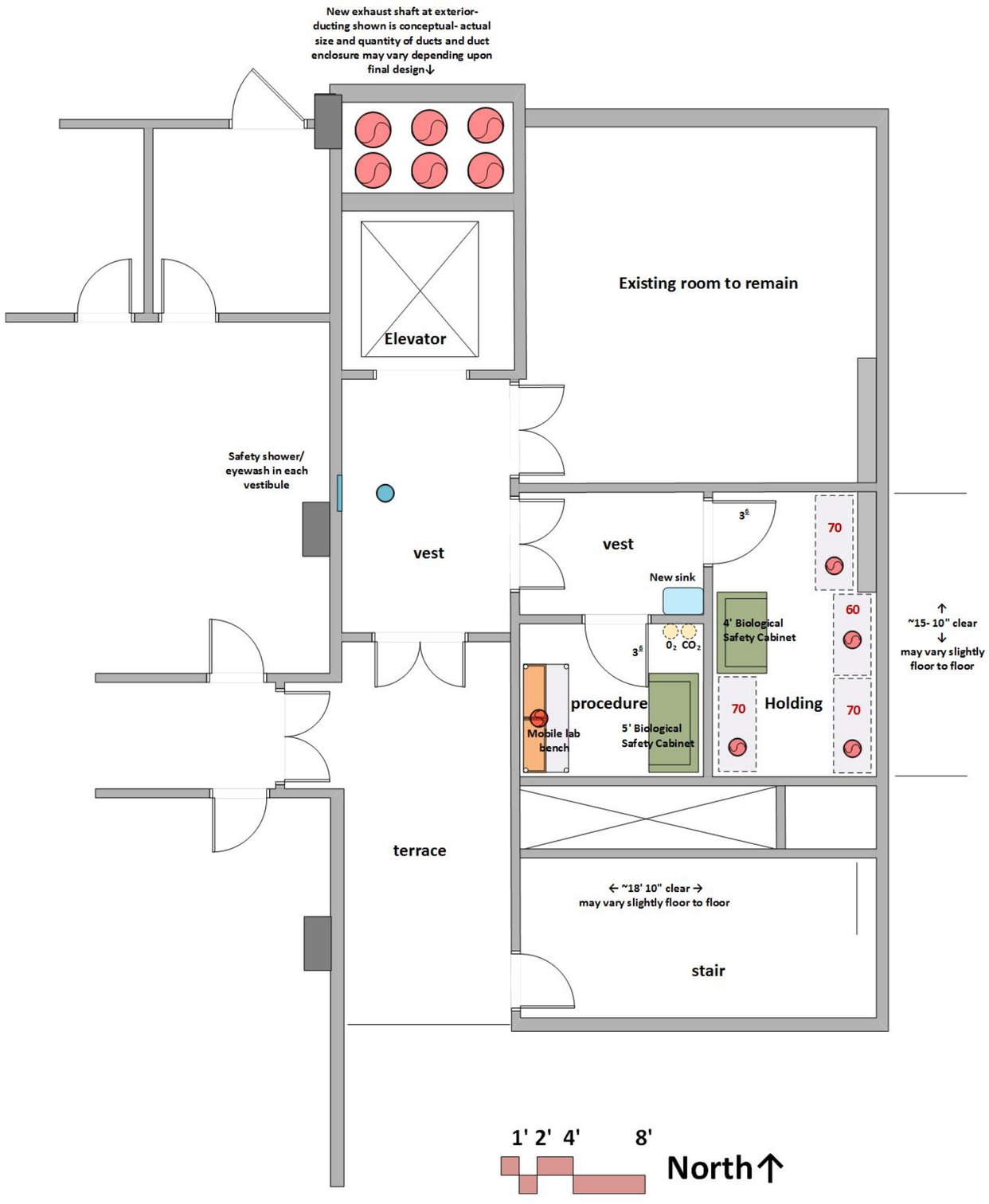
carts

LEVEL 9

Existing



← Area of Renovation
~20' x 37'
~740 s.f.



LEVEL 9

Proposed Renovation

ARCHITECTURAL

Occupancy: B
Floor: methyl methacrylate with integral coved base
Walls: metal stud with concrete backer board with fiberglass finish & epoxy paint
Soundproofing in holding room walls
Aluminum wall guards at corridor
Ceiling: waterproof gypsum board with fiberglass finish and epoxy paint at 10'
no access panels inside holding rooms and procedure rooms; Limit ceiling access panels to corridor
Doors: 3'-6"x8'-0" with red glass view window
Vermin proof: all penetrations to rooms sealed
Sound attenuation: NC 35 or less; sound insulation in walls and above ceiling.
Security: card key access

STRUCTURAL

Existing to remain

MECHANICAL

Temperature: 70 deg F +/- 2 deg F
Humidity: 30-70% relative
100% exhaust; Air changes: 10 air changes/hour plus exhaust for ventilated cage racks
Air change rate may be higher due to equipment heat gain
Pressure: Negative or positive depending upon use
Controls: BMS environmental monitoring for temperature, humidity, pressure, and lighting; with digital display at each holding room
Provide air exhaust connections at ceiling for ventilated cage racks

PLUMBING

Domestic tepid water at safety shower/eyewash in vestibule
Floor drain at safety shower/eyewash in vestibule
Animal watering system
Provide centrally piped 0_2 and CO_2 if available from building system; if not provide cylinder tanks for 0_2 and CO_2 in Procedure room

ELECTRICAL

115v20a1ph outlets at walls and ceilings (cage racks)
Standby power- all MEP systems on emergency power
New emergency generator required
Hardwire and wireless data
Lighting: recessed, sealed LED at 600 LUX with circadian lighting controls (intermatic timers at each room)
300 LUX unoccupied with manual switch for 600 LUX
White light for day cycle, red light for night cycle
Fire alarm: red strobe light

CONTRACTOR FURNISHED EQUIPMENT

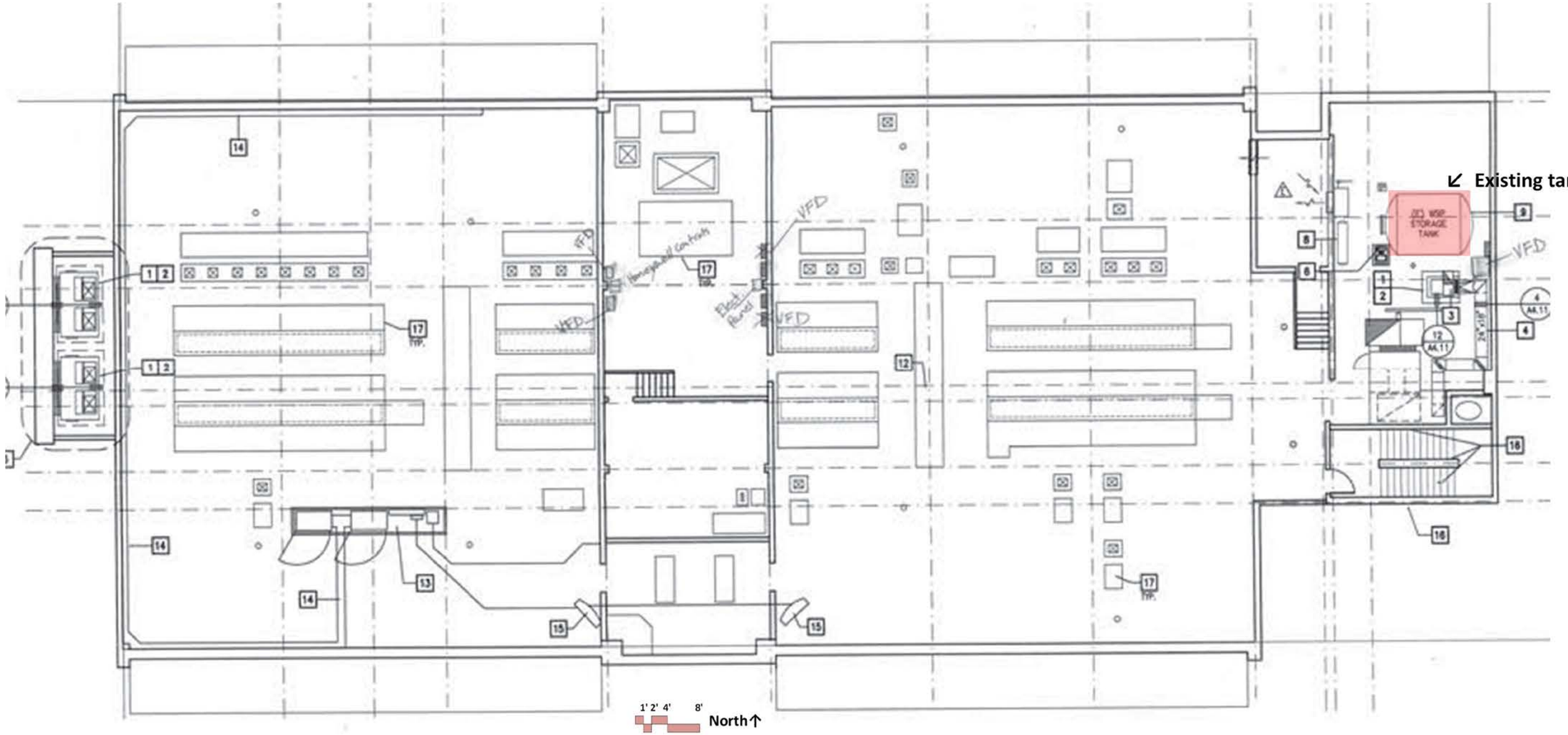
Safety shower/eyewash in vestibule
Stainless steel casework and sink in Procedure Room
Mobile lab bench in Procedure Room
Biological Safety Cabinets
Cylinder restraint

UNIVERSITY FURNISHED EQUIPMENT

Ventilated cage racks
Biological safety cabinets
CO2 and O2 cylinders

ROOF

Renovate roof as required for MEP upgrade to existing systems or new equipment required for vivarium renovation on floors below.



EQUIPMENT CUT SHEETS

T200 SERIES TUNNEL CAGE WASHERS

The BetterBuilt T200 Series Tunnel Washer is the result of a progressive approach to washer design. An approach that combines cleaning performance, ease of use and long-term durability to meet the demands of today's busy facilities.

Interior Trim Panels
T200 tunnel washers are built with stainless steel trim panels to close the space between the interior side-wall and the moving conveyor belt. These panels prevent small items such as sipper tubes or bottle stoppers from falling into the washer sump.

Noise Reduction
The stainless steel mesh conveyor runs on a series of nylon guides supported by a stainless steel frame. The nylon guides greatly reduce sound levels around the unit below 85dB and are in line with current worker safety recommendations.

Insulated Chamber and Treatment Sumps
The top, sides and bottom of the washer cabinet and side access doors are fully insulated and lined with stainless steel to reduce heat loss and noise transfer.

Safety Features
- The Load End and the Unload End are equipped with e-stop buttons located on both sides of the conveyor. When one or more of these buttons are pressed, the entire washer stops instantly.
- The conveyor belt has a clutch system that releases belt tension stopping forward movement when excess pressure is applied.
- All doors are equipped with contact sensors which prevent operation of the washer should any door not close prior to or open during operation.

Alkaline and Acid Compatible
All BetterBuilt washers have a stainless steel cabinet and circulatory system, containing no plastic or rubber connections. This makes the washer compatible with all alkaline or acidic detergents and extends the operational life of the washer.

Removable Upper and Lower Spray Manifolds
Positive spring-loaded connections ensure the best possible spray pressure from the spray manifolds. These manifolds are fitted with nylon wheels and wheel guides so they can be easily removed for cleaning.

Cold Water Pre-Wash
An additional spray header arm is provided in the pre-wash section which delivers added debris removal capabilities. A secondary benefit of this system is the reduction of steam vapor from the soiled end against the operator.

T200 SERIES TUNNEL CAGE WASHERS

APPLICATION
The BetterBuilt T200 Series conveyorized tunnel washers are automatic, heavy duty, high volume units designed to clean, sanitize and dry metal cages, plastic cages, water bottles in racks, pans and utensils used in the care and housing of research animals.

Note: Overall length is based on 36" load section, 48" pre-wash, 48" wash, 60" rinse and 48" unload section. 96" dryer section. Custom sizes can be provided, contact factory for details. Due to continued engineering improvements, specifications are subject to change without notice.

MODEL	INTERIOR CHAMBER W x H	EXTERIOR CABINET W x H x L
T224	24 x 24"	52 x 99 x 240"
	610 x 610mm	1320 x 2515 x 6096mm
T230	30 x 24"	58 x 99 x 240"
	762 x 610mm	1473 x 2515 x 6096mm
T236	36 x 24"	64 x 99 x 240"
	914 x 610mm	1626 x 2515 x 6096mm
T242	42 x 24"	70 x 99 x 240"
	1067 x 610mm	1778 x 2515 x 6096mm
T248	48 x 24"	76 x 99 x 240"
	1219 x 610mm	1930 x 2515 x 6096mm

STANDARD FEATURES
- All Stainless Steel Modular Construction
- Stainless Steel Piping and Components
- Insulated Chamber and Sumps
- Side Hinged Chamber Access Doors
- Stainless Steel Conveyor Belt
- Interior Trim Panels
- Automatic Five Step Cycle (Includes Optional Dryer)
- Automatic Solution Level Control
- Automatic Fill and Drain
- Hydraulic Hold Down
- 7.5 hp Pump on T248 in Both Wash and Rinse Chambers (All Other Models - 5 hp Pump)
- Wash and Rinse Temperature Guarantee
- 180°F Non Recirculated Final Rinse
- Cold Water Pre-wash Spray Header
- Drain Discharge Cool Down
- Easily Removable Spray Headers
- Large Debris Baskets are Easy to Remove for Cleaning
- Chemical Injection Ports, Contacts and Fittings
- Stainless Steel Sump Steam Coil Heating
- Stainless Steel Ventilation Dampers
- Multi-cycle Microprocessor Control System
- 8 Fully Adjustable Programmed Cycles
- 5" TFT Color Touchscreen Control Panel
- Program Security via Pin Number Access
- Built-in Advanced Diagnostics
- Emergency Stop Buttons at Both Ends
- Non-proprietary Components

OPTIONAL FEATURES
- Left or Right Side Service Access
- Barrier Wall Trim System
- Seismic Anchoring System
- Water Supply Temperature Booster
- Electric Sump Heating
- Energy Saver Heat Exchanger
- Roller Conveyor, Gravity or Powered
- Sloped Belt in Dryer Section
- Forced Air Nozzles
- Regenerative Blower w/Heated or Non-Heated Air Knife
- Power Exhaust Blower
- Exhaust Vapour Condenser
- Automatic Chemical Injection Pumps, Time Based
- pH Neutralization for Effluent
- Shut Off Valves
- Water Arrestors
- Automatic Descale System
- Hand Held Spray c/w 10' Hose
- Bedding Dispenser
- Bedding Disposal Unit (Sure-Flo)
- 8" TFT Color Touchscreen Control Panel
- Stainless Steel Control Guard
- Ethernet Connectivity to PLC or Touchscreen
- Factory Ethernet Connectivity for Online Diagnostics
- Modem Connectivity for Factory Diagnostics
- PLC and Touchscreen Program Backup
- Compact Flash Card for Data Collection
- RS485 Port for Data Download
- Impact or Thermal Cycle Data Printer
- Printer Cover
- CCTV Capability for Unload Side Camera
- Surge Protection
- Clean Side Buzzer

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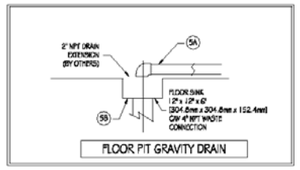
www.nsc-betterbuilt.com • info@nsc-betterbuilt.com

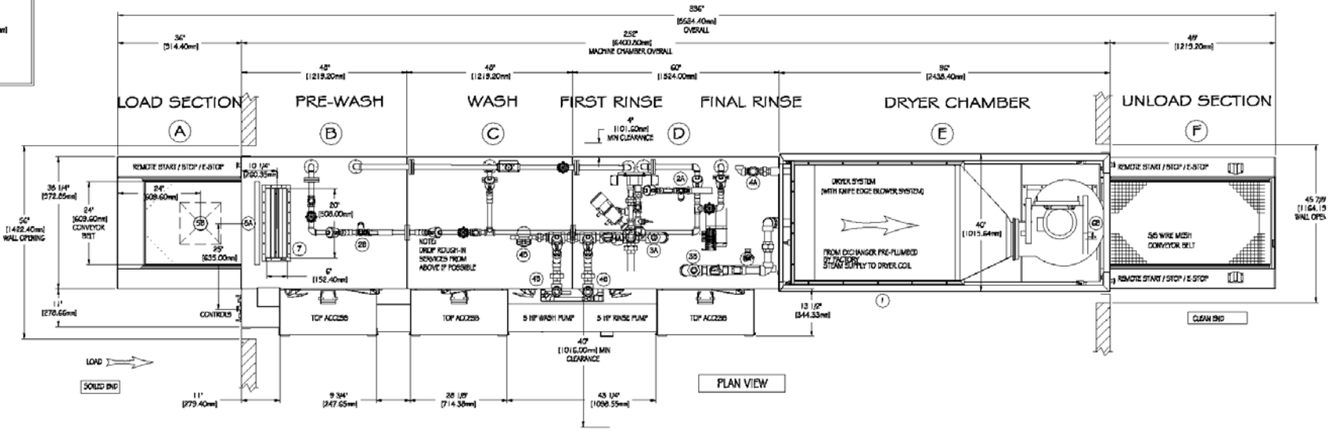
T200.04.16

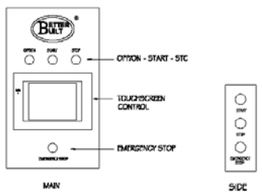
TUNNEL WASHER INSTALL DRAWING

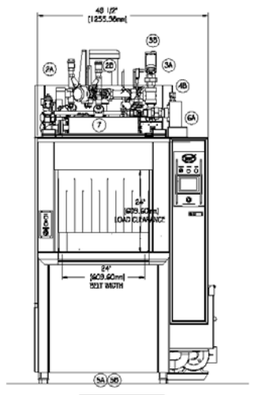
Model T224

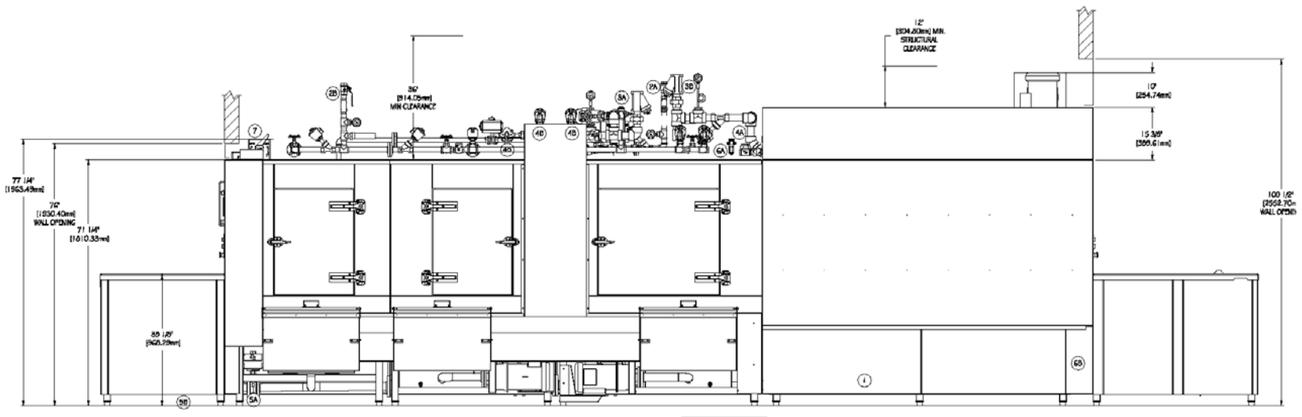


FLOOR PIT GRAVITY DRAIN









STANDARD FEATURES INCLUDED:

- ALL STAINLESS STEEL MODULAR CONSTRUCTION
- INSULATED CHAMBERS AND TREATMENT SUMPS
- SIDE HINGED CHAMBER ACCESS DOORS
- INTERIOR TRIM PANELS FROM BELT TO CABINET WA
- STAINLESS STEEL CONVEYOR BELT ON NYLON GUID
- ADJUSTABLE BELT SPEED CONTROL
- STAINLESS STEEL PUMP AND CIRCULATORY PIPING
- HYDRAULIC HOLD DOWN SPRAY SYSTEM
- REMOVABLE UPPER AND LOWER SPRAY JET HEADER
- TREATMENT TEMPERATURE GUARANTEE
- 180°F NON RE-CIRCULATED FINAL RINSE
- COLD WATER PRE-WASH SPRAY HEADER
- DRAIN DISCHARGE COOL DOWN
- AUTOMATIC SOLUTION LEVEL CONTROL
- AUTOMATIC FILL AND DRAIN
- LARGE REMOVABLE, DEBRIS FILTER SCREENS
- 5 CHEMICAL INJECTION PORTS, CONTACTS AND FITTINGS
- DIRECT CONNECTION EXHAUST VENT COLLARS
- 2 EMERGENCY STOP BUTTONS AT EACH END
- PRESSURE GAUGES MONITOR STEAM AND WATER SUPPLY
- CLEAN END UNLOAD SENSOR
- AUTOMATIC 5 STEP TREATMENT CYCLE
- 6 FULLY ADJUSTABLE PROGRAMMED CYCLES
- MULTI-CYCLE MICROPROCESSOR CONTROL SYSTEM
- 9" TFT COLOR TOUCHSCREEN CONTROL PANEL
- PROGRAM SECURITY VIA PIN NUMBER ACCESS
- BUILT-IN ADVANCED DIAGNOSTICS

OPTIONAL FEATURES INCLUDED:

- S/S TRIM - SOILED / CLEAN / BOTH
- NON SERVICE SIDE PANELS (ONLY REQD IF NOT AGAINST WALL)
- 96" DRYER SECTION, STEAM HEATED WITH CONVECTION AIR BLOWER
- INCLINED BELT
- FORCED AIR NOZZLES
- REGENERATIVE PRESSURE BLOWER - ELECTRICALLY HEATED
- 4/6/8FT LONG SECTION C/W S/S ROLLERS
- CLEAN DIVERTER STATION (CDS)
- AUTOMATIC DUAL ERROR DETECTION
- DIVERTED POWERED 4/6/8FT LONG SECTION C/W S/S ROLLE
- PRE-WASH / WASH / RINSE REMOVABLE SIDE TANKS
- ABILITY TO SEISMIC ANCHOR (SITE SPECIFIC CALCULATION AND INSTALLATION BY OTHERS
- STEAM OR ENERGY SAVER HEAT EXCHANGER, 60F -180F OR 120F -180F
- VENT COLLAR WITH DIRECT CONNECTION TO HVAC
- EXHAUST CONDENSER

GENERAL NOTES

1. DUE TO WET CONDITIONS, ELECTRICAL SUPPLY MUST BE PROVIDED USING SEALTITE FLEX CONDUIT AND BE FED VIA FUSED DISCONNECT PANEL PRIOR TO CONNECTION AT MACHINE POINTS.
2. SHUT OFF VALVES ARE REQUIRED IN THE HOT WATER, STEAM AND AIR LINES PRIOR TO CONNECTION AT MACHINE (BY OTHERS). RECOMMEND GAUGES ON ALL SERVICE CONNECTIONS. (BY OTHERS).
3. ALL WATER, AIR, STEAM, AND CONDENSATE LINES TO BE CONNECTED TO MACHINE VIA UNIONS (BY OTHERS).
4. RANGES ON SERVICE SCHEDULE INDICATE MINIMUM / MAXIMUM PRESSURES. PROVIDE A REGULATOR IN LINE PRIOR TO CONNECTION WITH MACHINE (BY OTHERS).
5. HEAT EXCHANGER CAPABLE OF RAISING 25 US GPM (OR 9 L/MIN) OF WATER FROM 120°F TO 180°F (49°C TO 82°C). STEAM PRESSURE NOT TO EXCEED 65 PSIG. (4.58 KG/SQ.CM)
6. ALL FINAL CONNECTIONS TO THE MACHINE BY OTHER TRADES MUST COMPLY WITH ALL APPLICABLE LOCAL CODE AND PRACTICES.
7. ALL ELECTRICAL DISCONNECTS BY OTHERS.
8. INSULATION REQUIRED ON MACHINE STEAM / HOT WATER LINES (BY OTHERS).
9. WATER ARRESTORS OR ANTI-HAMMERING EQUIPMENT TO E INSTALLED PRIOR TO CONNECTION WITH MACHINE. (BY OTHERS).
10. IF REQUIRED, ALL GAPS BETWEEN WASHER AND WALL OPENING, FINISH FLOOR, AND/OR PIT TO BE ENCLOSED BY OTHERS, TO CREATE SOILED SIDE - CLEAN SIDE BARRIER.
11. ALL INCOMING HOT WATER TO HAVE MAXIMUM WATER HARDNESS OF $CaCO_3$ 150ppm
12. 0 PSI MAXIMUM BACK PRESSURE ON CONDENSER LINES.
13. ALL STEAM DYNAMIC PRESSURE IS TO BE 40-60 PSI.
14. ALL STEAM PRESSURE REDUCING VALVES AND STEAM SAFETY / PRESSURE RELIEF VALVES ARE FURNISHED BY OTHERS. REFER TO SERVICE REQUIREMENT FOR MAXIMUM ALLOWABLE PRESSURE PER INSTALLATION

SHIPPING & GENERAL INFORMATION

SHIPPING WEIGHT:	6500 LBS (2955 KG)
(OVERALL UNCRATED) SIZES	
LOAD SECTION	36"L x 52"W x 86.5"H (914.4mm x 965.2mm x 977.9mm)
PRE-WASH SECTION	48"L x 52"W x 91"H (1219.2mm x 1320.8mm x 2128.6mm)
WASH SECTION	48"L x 52"W x 91"H (1219.2mm x 1320.8mm x 2128.6mm)
RINSE SECTION	60"L x 52"W x 91"H (1524mm x 1320.8mm x 2438.4mm)
DRYER SECTION	96"L x 40"W x 91"H (2438.4mm x 101.6mm x 2438.4mm)
UNLOAD SECTION	42"L x 80"W x 58.25"H (1219.2mm x 1828.8mm x 1377.2mm)
HEAT LOSS: 7,905 BTU/H UNIT - INSULATED WALLS	
CLEAN END: 62,000 Btu/hr SOILED END: 62,000 Btu/hr	
SERVICE AREA: 70,000 Btu/hr	
SUGGESTED HOOD COVERAGE REQUIREMENTS	
SOILED END: 1,500 TO 2,000 CFM MIN. (NOMINAL)	

SELECT	VOLTAGE	PHASE	HZ	AMPERAGE DRAW
	208 V	3	60	51.0 A
	240 V	3	60	46.5 A
	380 V	3	50	31.5 A
	415 V	3	50	28.5 A
	460 V	3	60	25.0 A
	575 V	3	60	20.6 A

SERVICE REQUIREMENTS & DATA

No.	SERVICE	CONNECTION	PRESSURE	FLOW RATE	CONSUMPTION
1	ELECTRICS CIRCUIT COMMON FOR ALL POWER - 100% / 0.5 HP MOTORS.	JUNCTION BOX	——	——	——
2A	HOT WATER (MAX HARDNESS: $CaCO_3$ 150 ppm) (180°F / 49°C MIN)	1" NPT	40-60 PSIG (2.75-4 BAR)	25 GPM (94 L/MIN)	600 GAL/HR (227 L/HR)
2B	COLD WATER (MAX HARDNESS: $CaCO_3$ 150 ppm) TANK / DRAIN COOL DOWN (60°F / 12°C MIN)	1" NPT	40-60 PSIG (2.75-4 BAR)	25 GPM (94 L/MIN)	——
3A	STEAM HX, (2) 15 HP COILS	1 1/2" NPT	40-60 PSIG (2.75-4 BAR)	1,200 - 1,800 LB/HR (544-680 KG/HR)	——
3B	STEAM DRYER COIL	1 1/2" NPT	40-60 PSIG (2.75-4 BAR)	600 LB/HR (272 KG/HR)	——
4A	CONDENSATE (RETURN TO BOILER VIA FLASH TANK - RECOMM.)	3 @ 1" NPT	MAX. 15 PSIG (1.7 BAR) BACK PRESSURE	——	——
4B	CONDENSATE (RETURN TO BOILER VIA FLASH TANK - RECOMM.)	3 @ 3/4" NPT	MAX. 15 PSIG (1.7 BAR) BACK PRESSURE	——	——

SERVICE REQUIREMENTS & DATA

No.	SERVICE	CONNECTION	PRESSURE	FLOW RATE	CONSUMPTION
5A	MACHINE DRAIN (TEMPERED WASTE LINE)	2" NPT	——	55 GPM (152.5 L/MIN) CONTINUOUS	——
5B	FACILITY DRAIN	4" NPT. 1 PER 1 PUMP CURRENT RATED	——	55 GPM (152.5 L/MIN) CONTINUOUS	——
6A	COMPRESSED AIR (ENVIROLITES)	1/4" NPT.	80 PSIG (5.5 BAR)	3 CFM (1 CMS)	——
6B	COMPRESSED AIR (ENVIROLITES)	3/4" NPT.	80 PSIG (5.5 BAR)	40 CFM (67.96 CMS)	——
7	EXHAUST VENT EXHAUST DUCT CONNECTION	6" x 20" (152.4mm x 508mm) FLANGED	15". W.G. (13 mm W.G.)	600 CFM (1016.41 CMS)	——

PROJECT:

TYPICAL

-

MODEL T224

TUNNEL WASHER

BETTER BUILT®
NORTHWESTERN SYSTEMS CORP
7503 MACDONALD ROAD, DELTA, B.C. V4G 1P
TEL: (604) 952-0325 FAX: (604) 952-0341

DESIGNED:	BETTERBUILT	REVISIONS:	
DRAWN:	AM	E	
DATE:	22-FEB-16	D	
JOB NO.:	TYPICAL	C	
SCALE:	1:16	B	
DRAWING NO.:	T224-021 6-TYP-DRYER-RH	A	

TPS
Thermal Product Solutions

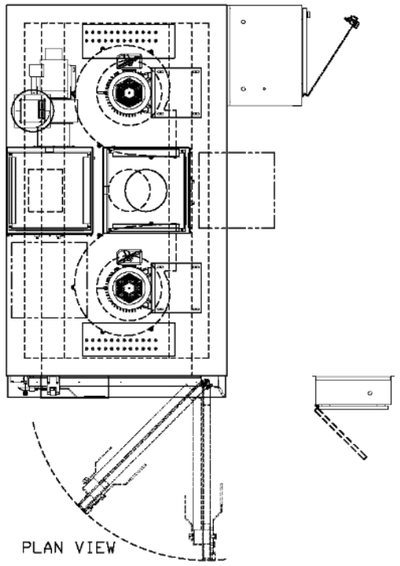
Truck-In Sterilizers

Gruenberg

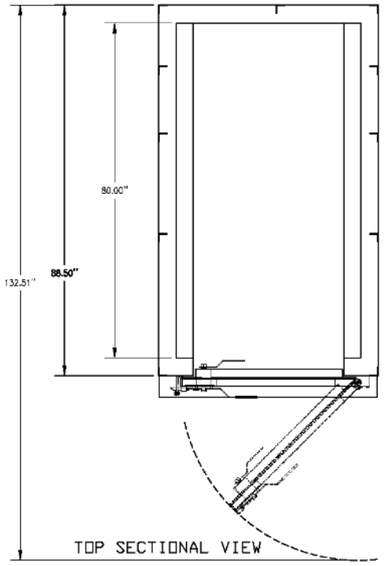
Unit will be single cage capacity.

Features and Benefits

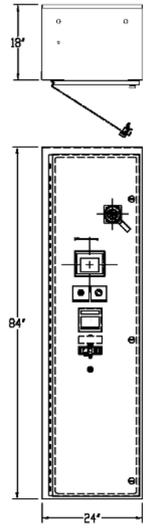
- Green operation with lower total energy consumption
- Economical cost
- Flexible installation and customization options
- Validated sterilization cycles for assured results
- Energy efficient electrical heating system
- Easy to use controls
- PrecisionFlo™ Full focused airflow
- HEPA Filters
- Data acquisition capabilities
- Panelized design



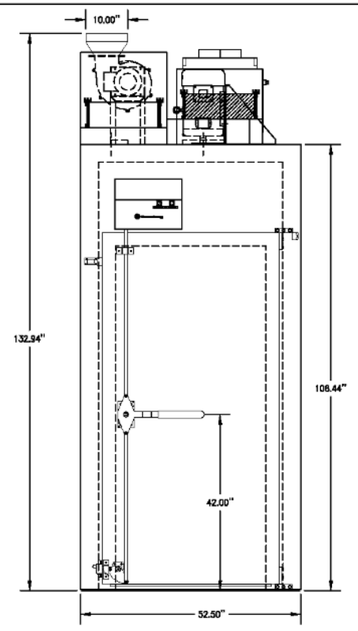
PLAN VIEW



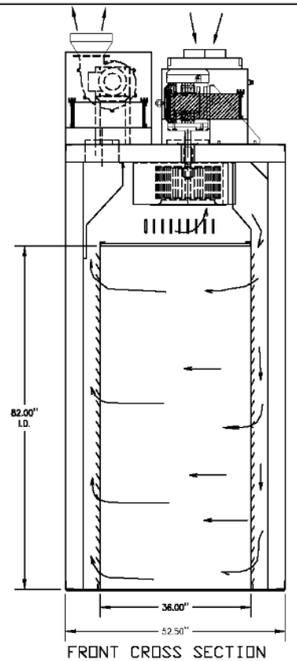
TOP SECTIONAL VIEW



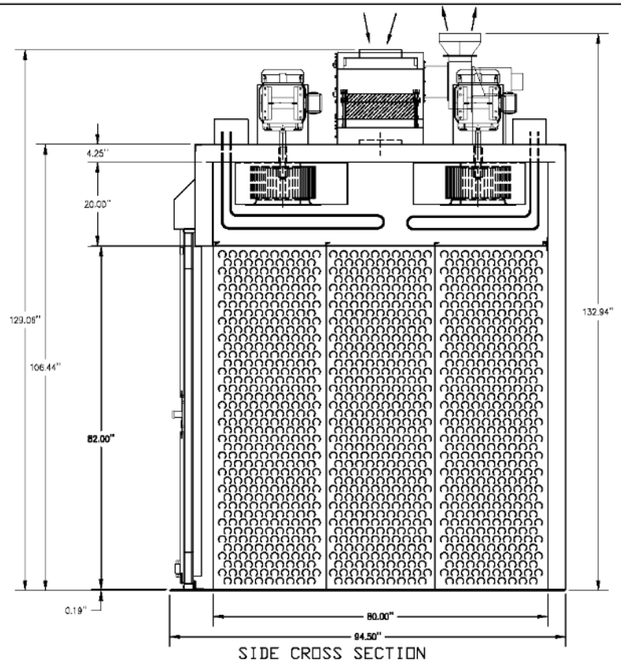
PRELIMINARY LAYOUT
FOR REFERENCE ONLY



FRONT VIEW



FRONT CROSS SECTION



SIDE CROSS SECTION

Unique Features Offer Workflow Flexibility

Feed Hoppers
Optional Feed hoppers allow technicians to easily access a food source within a sterile work zone. Up to 2 feed hoppers can be added on each side wall (total of 4) allowing the user to create a workflow utilizing one food source, or to segment up to 4 different diets.

Deep Wells
Optional deep wells can be added to stack clean or dirty cages inside a sterile work zone. Deep wells work well with the Innovive Disposable Caging System.

Waste Disposal System
Optional Waste Disposal System located within the work zone lets technicians dump bedding and waste while maintaining NSF/ANSI 49 Class II conditions.

Built-in Pass Through / Dirty Cage Collection
Optional Pass Through can allows technicians stack dirty cages outside of the work zone into a biohazard bag or can be built to connect to a glove box or even built into a wall for room to room transfers.

BIOLOGICAL SAFETY CABINET CUT SHEET

LabGard® NU-677 Biological Safety Cabinet

Specifications

Catalog Number	NU-677-400 Nominal 4 foot (1.2m)	NU-677-500 Nominal 5 foot (1.5m)	NU-677-600 Nominal 6 foot (1.8m)
Performance Specifications	NSF/ANSI 49		
NSF Std. No. 49 Class	Class II, Type A2		
Style of Cabinet	Bench top/console with basestand		
Cabinet Construction	All welded stainless steel 16GA, Type 304 pressure tight design		
Diffuser for Air Supply (Metal)	Non-flammable		
HEPA Filter Seal Type: Supply Filter-99.99% - Eff. on 0.3 microns Exhaust Filter-99.99% - Eff. on 0.3 microns	HEPEX Seal, Neoprene, Spring-loaded		
Fumigation (per NIH/NSF Procedure):	Yes		
Standard Services (Duplex Outlet):	Two, Backwall		
Optional Services: Gas Cocks $^{3}/_{8}$" NPT Ultraviolet Light	Up to 3 Each Side wall, One Back wall		
Cabinet Size Inches (mm):			
Height Maximum	97 $^{1}/_{2}$ (2477)	97 $^{1}/_{2}$ (2477)	97 $^{1}/_{2}$ (2477)
Height Minimum	79 (2007)	79 (2007)	79 (2007)
Width	53 $^{5}/_{8}$ (1362)	65 $^{5}/_{8}$ (1667)	77 $^{5}/_{8}$ (1972)
Depth (with Control Center & Armrest)	32 $^{3}/_{4}$ (832)	32 $^{3}/_{4}$ (832)	32 $^{3}/_{4}$ (832)
Work Access Opening Inches (mm):			
Standard Opening	12 (305)	12 (305)	12 (305)
Standard Inflow Velocity	105 FPM (.53 m/s)	105 FPM (.53 m/s)	105 FPM (.53 m/s)
Work surface Height Min/Max	24 $^{1}/_{2}$ (662) / 43 (1092)	24 $^{1}/_{2}$ (662) / 43 (1092)	24 $^{1}/_{2}$ (662) / 43 (1092)
Work Zone Inches (mm):			
Height	28 (711)	28 (711)	28 (711)
Width	46 $^{3}/_{8}$ (1178)	58 $^{3}/_{8}$ (1483)	70 $^{3}/_{8}$ (1788)
Depth	25 (635)	25 (635)	25 (635)
Viewing Window (Tempered Sliding Glass) Inches (mm):	Fully Closed to 20 (508) Open		
Light Intensity on Work Surface:	90 - 120 lm/ft^2 (968 - 1291 Lux)		
Required Exhaust CFM/CMH (Standard/Optional):			
Variable Flow Canopy (NU-911)	486 / 656 (626 / 1115)	611 / 761 (1038 / 1293)	758 / 868 (1288 / 1475)
Fixed Flow Canopy (NU-907)	526 (894)	651 (1106)	796 (1352)
Plant Duct Static Pressure:	Minimum 0.05 in. (1.27 mm) | Maximum 0.1 in. (2.54 mm)		
Sound Level:	67 dbA		
Heat Rejected, BTU, Per Hour, Non-vented / Vented:	2551 / 157		
Electrical:	115V / 60 Hz | E: 230V / 50-60Hz		
Energy Usage:	275 W	425 W	445 W
Crated Shipping Weight*: Net Weight	800 lbs. / 362 kg. 750 lbs. / 340 kg.	865 lbs. / 392 kg. 815 lbs. / 369 kg.	930 lbs. / 421 kg. 880 lbs. / 398 kg.

* Crated shipping weight does not include weight for accessories or options.

Ventilated Rack

Mouse: Single Sided, IVC with Rear Plenums

Features:

- Efficient operation
- Scavenging exhaust tolerant of airflow fluctuations
- Individually Ventilated Cages
- Cage environment isolated from room
- Excellent in-cage air distribution
- Fully seam-welded stainless steel construction
- Clean out panels allow complete wash access
- Interfaces with house supply and exhaust air
- Fully autoclavable

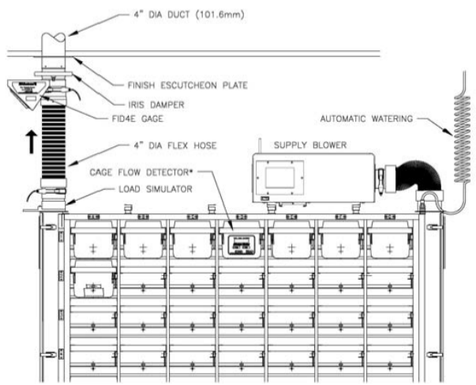
Specifications:

Rack Size*	Cage Size	Animal Capacity	Supply Airflow	Exhaust Airflow	ACH	Weight
70	75J	350	14 CFM @ 0.05 in. H_2O (23.7 m^3/hr @ 12.4 Pa)	45 CFM @ 0.22 in. H_2O (76.4 m^3/hr @ 54.7 Pa)	60	750lbs (341kg)
80	75J	400	16 CFM @ 0.05 in. H_2O (27.1 m^3/hr @ 12.4 Pa)	50 CFM @ 0.24 in. H_2O (84.9 m^3/hr @ 59.8 Pa)	60	807lbs (366.8kg)

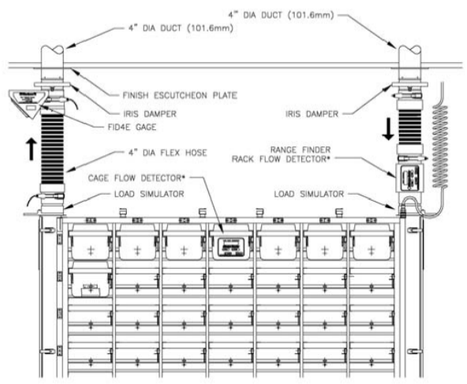
Note: *a.) Airflow at sea-level b.) Rack weight without blowers, animals, bedding or watering*
*c.) Airflow tolerance ±10% d.) *Other configurations available*

Installation Options: (opposite side plenums shown for clarity)

Supply Blower / Direct Exhaust



Direct Supply & Exhaust



** FLOW DETECTORS USED ONLY DURING RACK INSTALLATION*

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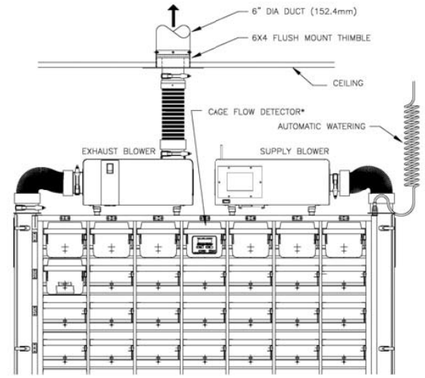
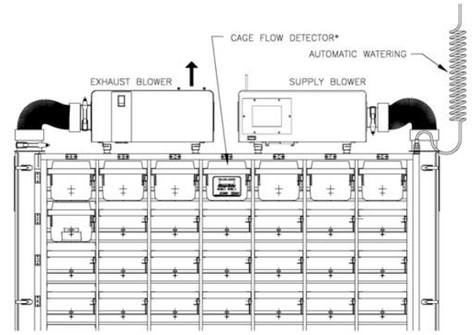
Allentown

Ventilated Rack

Supply & Exhaust Blowers (Thimble Connect)

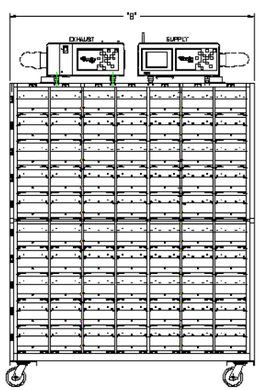


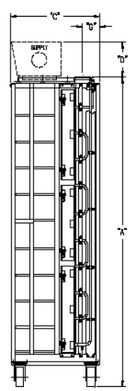
Supply & Exhaust Blowers



** FLOW DETECTORS USED ONLY DURING RACK INSTALLATION*

Physical Dimensions: (rear view plenums)





Standard design (shown)	
Watering	SHR
Platform	Split
Caster	5" Diameter (127mm)
Supply Blower	EFS110
Exhaust Blower	EFV111

Rack Dimensions				
Rack Size	70		80	
	inches	**mm**	**inches**	**mm**
A	80.19	2037	80.19	2037
B	63.00	1600	71.50	1816
C	22.88	581	22.88	581
D	SupplyPAK = 9.25in / 235mm			
D	ExhaustPAK = 10.5in / 267mm			
E	42.50	1080	51.00	1295
F	10.25	260	10.25	260
G	4.50	114	4.50	114

Notes:
- Add 3" (76.2mm) to "A" for 8" (203.2mm) diameter caster
- Add 6.687" (169.8mm) to "B" and subtract 1.000 from "C" for opposite side plenums

Allentown products are highly customizable at the end users request and this data sheet may not reflect the exact parameters specified for a specific project. Allentown recommends that projects that have critical size, airflow, water or electrical needs be handled through approval drawings to insure all critical areas are addressed and have visibility throughout the team including, A&E, MEP and construction persons.

Ventilated Rack

Mouse: Double Sided, IVC with Same Side Plenums

Features:

- Efficient operation
- Scavenging exhaust tolerant of airflow fluctuations
- Individually Ventilated Cages
- Cage environment isolated from room
- Excellent in-cage air distribution
- Fully seam-welded stainless steel construction
- Clean out panels allow complete wash access
- Interfaces with house supply and exhaust air
- Same-sided plenums for wall-mounted blowers or simplified ceiling connection
- Fully autoclavable

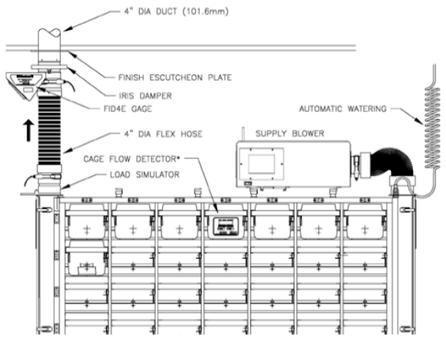
Specifications:

Rack Size*	Cage Size	Animal Capacity	Supply Airflow	Exhaust Airflow	ACH	Weight
98	75J	490	20 CFM @ 0.06 in. H_2O (33.1 m^3/hr @ 14.9 PA)	61 CFM @ 0.25 in. H_2O 103.6 m^3/hr @ 62.2 PA)	60	857lbs (389kg)
112	75J	560	19 CFM @ 0.06 in. H_2O (32.2 m^3/hr @ 14.9 PA)	59 CFM @ 0.24 in. H_2O (100.2 m^3/hr @ 59.8 PA)	60	998lbs (454kg)
126	75J	630	25 CFM @ 0.07 in. H_2O (42.5 m^3/hr @ 17.4 PA)	75 CFM @ 0.25 in. H_2O (127.5 m^3/hr @ 62.2 PA)	60	
140	75J	700	27 CFM @ 0.08 in. H_2O (45.8 m^3/hr @ 19.9 Pa)	88 CFM @ 0.23 in. H_2O 149.5 m^3/hr @ 57.2 Pa)	60	1000lbs (455kg)
160	75J	800	32 CFM @ 0.10 in. H_2O (54.3 m^3/hr @ 24.9 Pa)	105 CFM @ 0.27 in. H_2O (178.4 m^3/hr @ 67.2 Pa)	60	1284lbs (584kg)

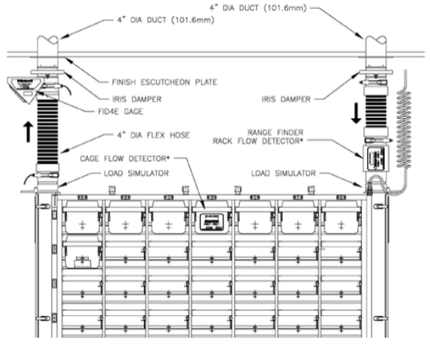
Note: a.) Airflow at sea-level b.) Rack weight without blowers, animals, bedding or watering c.) Airflow tolerance ±10%
*d.) *Other configurations available*

Installation Options (opposite side plenums shown for clarity):

Supply Blower / Direct Exhaust



Direct Supply & Exhaust



**FLOW DETECTORS USED ONLY DURING RACK INSTALLATION*

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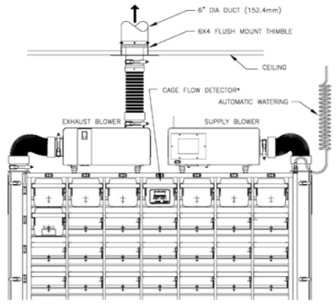
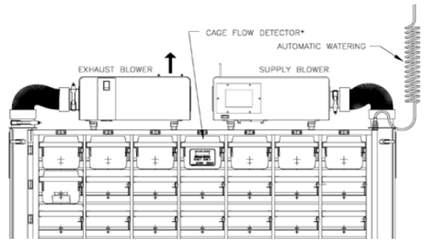
Allentown

Ventilated Rack

Supply & Exhaust Blowers (Thimble Connect)

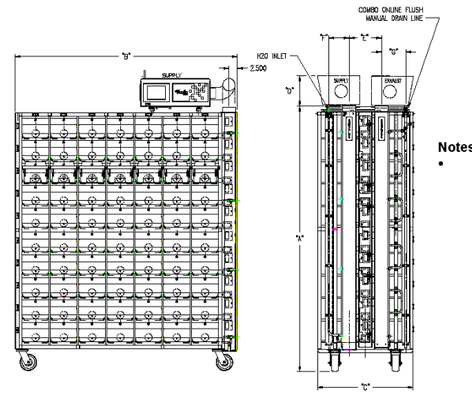


Supply & Exhaust Blowers



**FLOW DETECTORS USED ONLY DURING RACK INSTALLATION*

Physical Dimensions (same sided plenums):



Notes:

- Add 3" (76.2mm) to "A" for 8" (203.2mm) diameter caster

Rack Dimensions

Rack Size	98		112		126		140		160	
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
A	61.41	1560	65.81	1672	72.91	1851	79.31	2014	79.81	2027
B	70.66	1795	70.67	1795	70.66	1795	70.66	1795	79.17	2021
C	29.00	736	29.00	736	29.00	736	29.00	736	29.00	736
D	SupplyPAK = 9.25 inches / 235mm									
D	ExhaustPAK = 11.00 inches / 279mm									
E	6.63	168	6.63	168	8.00	203	8.00	203	8.00	203
F	7.63	194	7.63	194	11.13	283	11.13	283	11.13	283

Allentown products are highly customizable at the end users request and this data sheet may not reflect the exact parameters specified for a specific project. Allentown recommends that projects that have critical size, airflow, water or electrical needs be handled through approval drawings to insure all critical areas are addressed and have visibility throughout the team including, A&E, MEP and construction persons.

Dortek®
Hygienic door systems

Hygienic Sliding Doors
Complete Solutions

Acoustic Doors | Coldstore Doors | Fire Doors | FRP Doors | Glass Doors | GRP Doors | Hermetic Doors | Hygienic Doors | Rapid Roll Doors | Sliding Doors | Traffic Doors | Transfer Hatches | Waterproof Doors | Windows | X-ray Doors

Applications:
- Pharmaceutical
- Food
- Healthcare
- Research Laboratories

www.dortek.com

Ultra Clean GRP Construction

Completely smooth and seamless gelcoat finish which is non porous and non shedding. Free from organic materials, ledges, recesses or right angles, for flawless hygiene. Proven to maximise efficiency, safety and cleanability in the most demanding environments.

Dortek's sliding doors combine safety without compromising high standards of hygiene and durability. These GRP doors do not harbour bacteria and are unaffected by moisture and common cleaning chemicals. Their smooth, controlled, sliding action maximises space and reduces the movement of airborne micro-organisms.

Unique to Dortek, our fire rated sliding doors have a patented concealed intumescant strip. The strip is activated by the heat of a fire and expands to create a sealed fire door.

Our doors can be provided with a range of automations for easy, convenient access. Standard safety features include reverse opening if an obstruction is present.

We are able to offer an inherently superior product, a product which is more hygienic, more intelligent and capable of providing the ultimate fire protection.

Key Features

- ✓ **Fully sealed, flush hygienic construction.**
- ✓ **Non fire rated or fire rated (F30-F180).**
- ✓ **Standard or bespoke sizes.**
- ✓ **GRP or SS frames (GRP only for fire doors).**
- ✓ **Customised applications: manual, automatic, interlocking, hermetic sealed, lead lined.**
- ✓ **Excellent resistance to most disinfectants, solvents and other strong chemicals including H2O2.**
- ✓ **Wide range of factory fitted hardware, vision panels and door protection.**
- ✓ **Naturally environmentally-friendly: long life expectancy.**
- ✓ **low life cycle costs.**

Dortek - Specification Overview

Leading edge technology for superior hygiene performance

High-Efficiency, Low-Emissions Steam Boiler in a Compact Footprint

The Cleaver-Brooks compact, gas-fired ClearFire®-V vertical boiler is designed specifically for the requirements of the commercial market and is available in sizes ranging from 9.5 to 60 boiler horsepower at 150 psig design pressure and 60 psig minimum operating pressure.

ClearFire–V
9.5-60 HP

Features

Maximum fuel savings with ALUFER® tubes, full burner modulation and high-turndown via variable-speed blower

Small footprint with vertical design

High efficiency, up to 85% reduction in greenhouse gas emissions

Easily tuned, zero-governor, premix burner

Reliable operation, with no dampers or linkages

Advanced combustion design eliminates need for flue gas recirculation and provides low emissions (< 20 ppm NOx and less than 10 ppm CO)

ModBus (RS 485) communications

Ultra-quiet operation less than 70 dBA

Reduced electrical energy consumption with single-phase power -115V

Direct spark ignition

Low gas supply pressure less than 14" W.C.

UL Listed (Natural Gas)

Controls are CSD-1 Compliant

Simplified operation/installation

Standard atmospheric chemical feed pump

Installed boiler feed pump contactor

Single-Source Skid Package Solutions

Turn-key steam solution

Cleaver-Brooks offers standard and complete steam boiler system skid-mounted packages in gas and propane fuels. The package includes the steam boiler, feed system and blowdown separator with optional chemical feed system and water softener. This complete package saves you time installing the system as all that is required is a single-power, gas, steam and water connection.

Features

- Single-Source Responsibility
- Plug and Play, reduced installation cost
- Standard Skid Solutions to meet your needs
- Eliminate field piping and wiring errors

Maximize Efficiency to 87% with an Economizer

The ECF ClearFire® economizer is a stainless steel coil tube arrangement using extended heating surface fins to maximize heat transfer. Flue gas from the boiler passes over the coiled tube, which conveys incoming feedwater.

Feedwater preheated in this fashion reduces the need for a steam feedwater heater, resulting in efficiencies of up to 87% in non-condensing applications.

BUDGET DETAILS

BUDGET DETAILS

USC
Capital Construction Development

PROJECT BUDGET WORKSHEET

Date: 08/04/2017
PR: PR044169
Name: HMR - Hoffman Core Lab Renovation Feasibility Study
Account Number: 16-7974-0952
Project Manager: Joe McIntyre
Description: Feasibility Study Cost Estimate for renovation of Vivarium Spaces and Addition of Tunnel Washer System, RO Water System, Steam Generator and associated equipment.**NOTE: Does not include for move in/move out costs.**

Gross Building Area:	7,500	GSF
Net Building Area:	5,800	SF
Cost per Gross SF:	$ 1,534.16	
Building Type:	0	

No.	Code	Item	Budget	% Total Budget	Comments
1	15118 / 44710	Construction Contract	$ 6,874,600		See detail on Project Budget Assumptions
2	15122 / 44711	Other Construction	$ 150,000		
3	/ 44713	Add 2nd floor per Dr. Casebolt (6/13/17)	$ 89,800		
		Construction	$ **7,114,400**	62%	Total lines 1 through 3
4	15112 / 44330	Site Preparation	$ 0		
5	15110 / 44331	Demolition	$ 0		
6	15114 / 44350	Utility Connections	$ 0		
7	15115 / 44355	Telecommunications/Data Lines	$ 75,000		IT Infrastructure & Cabling
8	15113 / 44360	Environmental Remediation	$ 100,000		Abatement
9	15119 / 44365	Audio Visual	$ 0		
10	15120 / 44366	Security	$ 77,500		Access Control/Upgrade Existing
11	15116 / 44510	Landscaping	$ 0		
12	15109 / 44530	Graphics / Signage	$ 25,000		
13	15123 / 44010	Furnishings - under $5K	$ 0		
14	15127 / 44810	Furnishings - over $5K	$ 0		
15	15124 / 44020	Movable Equipment - under $5K	$ 0		
16	15128 / 44821	Movable Equipment - over $5K	$ 0		
17	15117 / 44030	Fixed Equipment - under $5K	$ 0		
18	15126 / 44830	Fixed Equipment - over $5K	$ 1,418,400		CFCI Equipment: See detail on Project Budget Assumptions
19	/ 44822	Moveable Equipment - Computers	$ 0		
20	/ 44840	Vehicles	$ 0		
21	/ 44850	Scientific Equipment Purchases	$ 0		
		Other Construction	$ **1,695,900**	15%	Total lines 4 thru 21
		Subtotal Hard Costs	$ **8,810,300**	77%	Total lines 1 through 21
22	15100 / 44210	Preliminary Expenses (Programming)	$ 64,000		Preconstruction
23	15102 / 44220	Architect / Engineer Fee	$ 976,200		
24	15108 / 44230	Owner's Consultants	$ 108,800		
25	15101 / 44240	Reimbursable Expenses	$ 54,300		
26	15103 / 44250	Project Management	$ 335,200	3.0%	Project Management Fee Structure
27	15104 / 44310	Certified Inspection	$ 10,000		
28	15105 / 44320	Soil Testing	$ 0		
29	15106 / 44340	Plan Check / Permit Fees	$ 88,800		
30	15107 / 44410	Legal / Administrative Services	$ 5,000		
31	20230 / 44420	O&M / Misc Expenses / Shutdown	$ 13,000		FMS Work Orders
32	15111 / 44610	Moving Expenses	$ 25,000		Per Dr. Casebolt: By Customer (Supplemental Allowance here only)
		Soft Costs	$ **1,680,300**	15%	Total lines 10 thru 32
		Subtotal Hard and Soft Costs	$ **10,490,600**	91%	Total lines 1thru 30
33	15125 / 44910	Total Contingency	$ 1,015,600	10%	% of Hard and Soft Costs
		TOTAL PROJECT BUDGET	$ **11,506,200**	100%	Total lines 32 and 33
		Less Previously Funded	64,000		Preconstruction
		Owner Furnished Equipment	$ 2,453,927		Also included animal changing stations, mobile lab benche and bedding dispenser
		Add 2nd Floor Cages & BSC (6/13/17)	$ 213,097		7 cage racks & 3 BSC
		TOTAL FUNDING REQUIRED	$ **14,109,224**		

USC
Capital Construction Development

Date: 08/04/2017
PR: PR044169
Name: HMR - Hoffman Core Lab Renovation Feasibility Study
Account Number: 16-7974-0952
Project Manager: Joe McIntyre
Description: Feasibility Study Cost Estimate for renovation of Vivarium Spaces and Addition of Tunnel Washer System, RO Water System, Steam Generator and associated equipment. **NOTE: Does not include for move in/move out costs.**

PROJECT BUDGET ASSUMPTIONS

Gross Building Area:		**GSF**
Net Building Area:	**5,800**	**SF**
Building Type:		

No.	Code	Item	Quantity	Unit	Unit Cost		Total	Adjusted Total	Comments/Assumptions
15118/ 44710	**CONSTRUCTION CONTRACT**								
		Base Scope Lab Renovation, Preparations and Infrastructure for Tunnel Washer and Equipment	1	LS	$5,977,866.00	$	5,977,866.00		
		Estimate/Plan Development Allowance	5.00%	%	$5,977,866.00	$	298,893.30		
		Phasing Allowance	5.00%	%	$5,977,866.00	$	298,893.30		
		Unforeseen Condtions Allowance	2.50%	%	$5,977,866.00	$	149,446.65		
		Premium Time Allowance	2.50%	%	$5,977,866.00	$	149,446.65		
					TOTAL	$	6,874,545.90	**$6,874,600**	
15122/ 44711	**OTHER CONSTRUCTION**		**Quantity**	**Unit**	**Unit Cost**				
		Vestibule Finish Upgrade Allowance	1	LS	$100,000.00	$	100,000.00		
		8th Floor Relocation Allowance	1	LS	$50,000.00	$	50,000.00		
					TOTAL	$	150,000.00	**$150,000**	
N/A / 44713	**N/A**		**Quantity**	**Unit**	**Unit Cost**				
		Add 2nd floor construction cost per Dr. Casebolt	1.00	LS	$89,800.00	$	89,800.00		
			0.00	SF	$0.00	$	-		
			0.00	SF	$0.00	$	-		
			0.00	SF	$0.00	$	-		
					TOTAL	$	89,800.00	**$89,800**	

Notes:
[a]
[b]
[c]
[d]

15112/ 44330 SITE PREPARATION	Quantity	Unit	Unit Cost		
Included in line item 44710.	0.00	SF	$0.00	$ -	
	0.00	SF	$0.00	$ -	
	0.00	SF	$0.00	$ -	
	0.00	SF	$0.00	$ -	
			TOTAL	$ -	**$0**

15110/ 44331 DEMOLITION	Quantity	Unit	Unit Cost		
Interior demolition ILO bond (4.2M@1.5%)	5800	SF	$0.00	$ -	
	0.00	SF	$0.00	$ -	
	0.00	SF	$0.00	$ -	
	0.00	SF	$0.00	$ -	
			TOTAL	$ -	**$0**

15114/ 44350 UTILITY CONNECTION	Quantity	Unit	Unit Cost		
Included in line item 44710.	0.00	NA	$0.00	$ -	
	0.00	NA	$0.00	$ -	
	0.00	NA	$0.00	$ -	
	0.00	NA	$0.00	$ -	
			TOTAL	$ -	**$0**

15115/ 44355 TELECOMMUNICATIONS / DATA LINES	Quantity	Unit	Unit Cost		
IT Infrastructure & Cabling	1.00	LS	$75,000.00	$ 75,000.00	
	0.00	EA	$0.00	$ -	
	0.00	EA	$0.00	$ -	
	0.00	EA	$0.00	$ -	
			TOTAL	$ 75,000.00	**$75,000**

15113/ 44360 ENVIRONMENTAL REMEDIATION	Quantity	Unit	Unit Cost		
Abatement	1.00	LS	$100,000.00	$ 100,000.00	
	0.00	EA	$0.00	$ -	
	0.00	EA	$0.00	$ -	
	0.00	EA	$0.00	$ -	
			TOTAL	$ 100,000.00	**$100,000**

15119/ 44365 AUDIO VISUAL	Quantity	Unit	Unit Cost		
	0.00	LS	$0.00	$ -	
	0.00	EA	$0.00	$ -	
	0.00	EA	$0.00	$ -	
	0.00	EA	$0.00	$ -	
			TOTAL	$ -	**$0**

151120 / 44366 SECURITY	Quantity	Unit	Unit Cost			
Door Security Systems-Linel/Access Contro	35	EA	$1,500.00	$	52,500.00	
Upgrade Existing Security System	1	LS	$25,000.00	$	25,000.00	
			TOTAL	$	77,500.00	**$77,500**

15116/ 44510 LANDSCAPING	Quantity	Unit	Unit Cost			
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
			TOTAL	$	-	**$0**

15109/ 44530 GRAPHICS / SIGNAGE	Quantity	Unit	Unit Cost			
Signage Allowance	1.00	LS	$25,000.00	$	25,000.00	
	0.00	EA	$0.00	$	-	
	0.00	EA	$0.00	$	-	
	0.00	EA	$0.00	$	-	
			TOTAL	$	25,000.00	**$25,000**

15123/ 44010 FURNISHINGS UNDER $5,000 UNIT PRICE	Quantity	Unit	Unit Cost			
	0.00	LS	$0.00	$	-	
	0.00	LS	$0.00	$	-	
	0.00	LS	$0.00	$	-	
	0.00	LS	$0.00	$	-	
			TOTAL	$	-	**$0**

15127/ 44810 FURNISHINGS OVER $5,000 UNIT PRICE	Quantity	Unit	Unit Cost		Total	
	0.00	LS	$0.00	$	-	
	0.00	LS	$0.00	$	-	
	0.00	LS	$0.00	$	-	
	0.00	LS	$0.00	$	-	
			TOTAL	$	-	**$0**

15124/ 44020 MOVEABLE EQUIPMENT UNDER $5,000 UNIT PRICE	Quantity	Unit	Unit Cost		Total	
	0.00	LS	$0.00	$	-	
	0.00	LS	$0.00	$	-	
	0.00	LS	$0.00	$	-	
	0.00	LS	$0.00	$	-	
			TOTAL	$	-	**$0**

15128/ 44821 MOVEABLE EQUIPMENT OVER $5,000 UNIT PRICE	Quantity	Unit	Unit Cost			
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
			TOTAL	$	-	**$0**

15117/ 44030 FIXED EQUIPMENT UNDER $5,000 UNIT PRICE	Quantity	Unit	Unit Cost			
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
			TOTAL	$	-	**$0**

15126/ 44830 FIXED EQUIPMENT OVER $5,000 UNIT PRICE	Quantity	Unit	Unit Cost			
CFCI Stainless Steel Casework	1	LS	$175,000.00	$	175,000.00	
CFCI Animal Watering System	1	LS	$427,349.00	$	427,349.00	
CFCI Biosafety Cabinets	18	EA	$12,000.00	$	216,000.00	Second Floor: (3) BSC cabinets are a separtae line item
CFCI Tunnel Washer	1	EA	$300,000.00	$	300,000.00	
CFCI Heat Sterilizer	1	EA	300,000.00	$	300,000.00	
			TOTAL	$	1,418,349.00	**$1,418,400**

N/A / 44822 MOVABLE EQUIPMENT - COMPUTERS	Quantity	Unit	Unit Cost			
	0.00	NA	$0.00	$	-	2nd floor
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
			TOTAL	$	-	**$0**

N/A / 44840 VEHICLES	Quantity	Unit	Unit Cost			
	0.00	LS	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
			TOTAL	$	-	**$0**

N/A / 44850 SCIENTIFIC EQUIPMENT PURCHASES	Quantity	Unit	Unit Cost			
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
			TOTAL	$	-	$0
TOTAL HARD COSTS						**$ 8,810,300**

15100/ 44210 PRELIMINARY EXPENSES (PROGRAMMING)	Quantity	Unit	Unit Cost			
Preconstruction Services	1.00	NA	$64,000.00	$	64,000.00	Feasibility Study
(Includes Design for Science design fee $25K)	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
	0.00	NA	$0.00	$	-	
			TOTAL	$	64,000.00	$64,000

15102/ 44220 ARCHITECT / ENGINEER	Quantity	Unit	Unit Cost			
Architect (Includes MEP)	10.00%	%	$ 8,874,300	$	887,430.00	
Structural Engineer (Structural Frame)	1.00%	%	$ 8,874,300	$	88,743.00	
				$	-	
				$	-	
			TOTAL	$	976,173.00	$976,200

15108/ 44230 CONSULTANTS	Quantity	Unit	Unit Cost			
Lab Equipment Consultant	1.00%	%	$ 8,874,300	$	88,743.00	
BAMA	1	LS	$5,000.00	$	5,000.00	
Environmental/HAZMAT	1	LS	$15,000.00	$	15,000.00	
				$	-	
				$	-	
			TOTAL	$	108,743.00	$108,800

15101/ 44240 REIMBURSABLE EXPENSES	Quantity	Unit	Unit Cost			
A/E, Structural, Environmental, Inspections	5.00%	%	$1,084,916.00	$	54,245.80	
	0.00	N/A	$0.00	$	-	
	0.00	N/A	$0.00	$	-	
	0.00	N/A	$0.00	$	-	
			TOTAL	$	54,245.80	$54,300

15104/ 44310	CERTIFIED INSPECTION	Quantity	Unit	Unit Cost			
	EH&S Signoffs	1	LS	$ 10,000	$	10,000.00	
	OCIP (deleted)	0.00%	LS	$ 8,874,300	$	-	
		0.00	LS	$0.00	$	-	
		0.00	LS	$0.00	$	-	
				TOTAL	$	10,000.00	$10,000

15105/ 44320	SOIL TESTING	Quantity	Unit	Unit Cost			
			LS	$0.00	$	-	
		0.00	LS	$0.00	$	-	
		0.00	LS	$0.00	$	-	
		0.00	LS	$0.00	$	-	
				TOTAL	$	-	$0

15106/ 44340	PLAN CHECK / BUILDING PERMIT	Quantity	Unit	Unit Cost			
	Plan Check/Permits	1.00%	%	$ 8,874,300	$	88,743.00	
		0.00	N/A	$0.00	$	-	
		0.00	N/A	$0.00	$	-	
		0.00	N/A	$0.00	$	-	
				TOTAL	$	88,743.00	$88,800

15107/ 44410	LEGAL / ADMINISTRATIVE SERVICES	Quantity	Unit	Unit Cost			
	REAM Assistance	1.00	LS	$5,000.00	$	5,000.00	
		0.00	N/A	$0.00	$	-	
		0.00	N/A	$0.00	$	-	
		0.00	N/A	$0.00	$	-	
				TOTAL	$	5,000.00	$5,000

20230/ 44420	O&M / MISCELLANEOUS EXPENSES	Quantity	Unit	Unit Cost			
	FMS Shutdowns	1.00	LS	$5,000.00	$	5,000.00	
	Lock Shop	1.00	LS	$8,000.00	$	8,000.00	
		0.00	N/A	$0.00	$	-	
		0.00	EA	$0.00	$	-	
				TOTAL	$	13,000.00	$13,000

15111/ 44610	MOVING EXPENSES	Quantity	Unit	Unit Cost			
	See 44711 Other Construction above	0.00	N/A	$0.00	$	-	
	Supplemental moving costs	1.00	ALLOW	$25,000.00	$	25,000.00	
		0.00	N/A	$0.00	$	-	
		0.00	N/A	$0.00	$	-	
				TOTAL	$	25,000.00	$25,000

NOTE: This is a supplemental budget allowance only and does not represent anticipated total move in/move out costs. Said costs to be carried by AR directly.

TOTAL SOFT COSTS	**$**	**1,345,100**
SUBTOTAL PROJECT COSTS	**$**	**10,155,400**

BUDGET DETAILS
(continued)

15125/ 44910	TOTAL CONTINGENCY	Quantity	Unit	Unit Cost		Total		
	Total Contingency for project is 10% of both hard and soft cost estimates (line 27)	10.0%	%	$10,155,400.00	$	1,015,540.00		
				TOTAL	**$**	**1,015,540.00**	**$1,015,600**	
							$	**11,171,000**

15103/ 44250	PROJECT MANAGEMENT	Quantity	Unit	Unit Cost				
	Project management fee of % of total project budget not including project management fee	3.0%	%	$11,171,000.00	$	335,130.00		
	Additional Project Management Fee							
				TOTAL	**$**	**335,130.00**	**$335,200**	

TOTAL PROJECT BUDGET	**$**	**11,506,200**

	$	11,506,200.00
	$	- s/b $0

Notes:

NA - Not Applicable
SF - Square Footage
% - Percent
LS - Lump Sum
EA - Each
YD - Yard

Project Management Fee:		
-	49,999	10.0%
50,000.00	99,999	8.0%
100,000.00	249,999	7.0%
250,000.00	499,999	6.0%
500,000.00	999,999	5.5%
1,000,000.00	1,999,999	5.0%
2,000,000.00	2,999,999	4.5%
3,000,000.00	4,999,999	4.0%
5,000,000.00	9,999,999	3.5%
10,000,000.00	19,999,999	3.0%
20,000,000.00		2.5%

Hard Costs	$	8,810,300
Soft Costs & PM Fees	$	1,680,300
Subtotal	$	10,490,600
Contingency	$	1,015,600
PROJECT BUDGET	**$**	**11,506,200**

Allentown
Partners in Quality. Partners in Service. Partners in Research.

Quote Number	00019558	Expiration Date	9/22/2017
Request No.	Rev - A	Payment Terms	20% upon approval of shop drawings, 30% manufacturing materially completed - project is more than 50% completed, 45% first delivery, 5% final acceptance.
Created Date	7/28/2017		

Name	Ramiro Montano, LAT	Created By	Jon Pidanick
Phone	(323) 442-4301	Created By Email	jpidanick@allentowninc.com
Email	rmontano@usc.edu		
Fax	(323) 442-4302		

Bill To Name	University of Southern California	Ship To Name	University of Southern California
Bill To	1501 San Pablo Street ZN1 B-104-A Los Angeles, CA 90089-9093 United States		

Leasing options may be available. Ask your sales representative for details.

Product Code	Product Description	Included	Sales Price	Quantity	Total Price
MB0JV140AD-0095	IVC, Mouse, 140 Cage 75J, Vent, Same Side Plenums 4" Exhaust (Right) & 4" Supply, Solid Platforms, SHR H2O, 5" x 2" HT Phenolic Casters, Bumpers, Edstrom Cage Locks, Double Face, 7 Columns x 10 Tiers, Drawing 411727	☐	USD 30,975.00	20.00	USD 619,500.00
PC75JHTSH	CAGE, MOUSE, 75JAG, HIGH TEMPERATURE PLASTIC, H2O SH(R), KUP	✓	USD 0.00	2,800.00	USD 0.00
MBT7115RHHR	MICRO BARRIER TOP, MOUSE, 7115, REDUCED HEIGHT, HIGH TEMPERATURE PLASTIC, REEMAY FILTER, BLUE HINGED RETAINER	✓	USD 0.00	2,800.00	USD 0.00
WBL7115SMD-AMG	WIRE BAR LID, MOUSE, 7115, STAINLESS STEEL, SHEET METAL DESIGN, WITH SQUARE STOPPER GUARD	✓	USD 0.00	2,800.00	USD 0.00
HH35P5-28	CARDHOLDER, 3" X 5", HORIZONTAL, POLYSULFONE HIGH TEMPERATURE PLASTIC, RED, 7115/75JAG/10147-VENT, LID MOUNT STAINLESS STEEL DOUBLE CLIP, FLIP UP	✓	USD 0.00	2,800.00	USD 0.00
EFS115GRB0-3R4E	BLOWER, SUPPLY, ECOFLO, 115V, WIVARIUM, GREY, BLUE LABEL, BLUETOOTH, NORTH AMERICA TWIST LOCK NEMA L5-20P CORD SET, ENGLISH	✓	USD 0.00	20.00	USD 0.00
MB0JV080CD-0286	IVC, Mouse, 80 Cage, 75J, Vent, Rear Plenums 4" Exhaust (Left) & 4" Supply, Solid Platforms, Edstrom Stainless Steel Automated Watering with Removable Valve (SHR Design), 5" x 2" High Temperature Phenolic Casters, Edstrom Cage Locks, Single Face, 8 Columns x 10 Tiers, Drawing 407967	☐	USD 23,100.00	29.00	USD 669,900.00
PC75JHTSH	CAGE, MOUSE, 75JAG, HIGH TEMPERATURE PLASTIC, H2O SH(R), KUP	✓	USD 0.00	2,320.00	USD 0.00
MBT7115RHHR	MICRO BARRIER TOP, MOUSE, 7115, REDUCED HEIGHT, HIGH TEMPERATURE PLASTIC, REEMAY FILTER, BLUE HINGED RETAINER	✓	USD 0.00	2,320.00	USD 0.00

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WBL7115SMD-AMG	WIRE BAR LID, MOUSE, 7115, STAINLESS STEEL, SHEET METAL DESIGN, WITH SQUARE STOPPER GUARD	✓	USD 0.00	2,320.00	USD 0.00
HH35P5-28	CARDHOLDER, 3" X 5", HORIZONTAL, POLYSULFONE HIGH TEMPERATURE PLASTIC, RED, 7115/75JAG/10147-VENT, LID MOUNT STAINLESS STEEL DOUBLE CLIP, FLIP UP	✓	USD 0.00	2,320.00	USD 0.00
EFS115GRB0-3R4E	BLOWER, SUPPLY, ECOFLO, 115V, WIVARIUM, GREY, BLUE LABEL, BLUETOOTH, NORTH AMERICA TWIST LOCK NEMA L5-20P CORD SET, ENGLISH	✓	USD 0.00	29.00	USD 0.00
MB0JV070CD-0412	IVC, Mouse, 70 Cage 75J, Vent, Rear Plenums 4" Exhaust (Left) & 4" Supply, Solid Platforms, Edstrom Stainless Steel Automated Watering With Removable Valve (SHR Design), 5" x 2" HT Phenolic Casters, Edstrom Cage Locks, Single Face, 7 Columns x 10 Tiers	☐	USD 20,475.00	18.00	USD 368,550.00
PC75JHTSH	CAGE, MOUSE, 75JAG, HIGH TEMPERATURE PLASTIC, H2O SH(R), KUP	✓	USD 0.00	1,260.00	USD 0.00
MBT7115RHHR	MICRO BARRIER TOP, MOUSE, 7115, REDUCED HEIGHT, HIGH TEMPERATURE PLASTIC, REEMAY FILTER, BLUE HINGED RETAINER	✓	USD 0.00	1,260.00	USD 0.00
WBL7115SMD-AMG	WIRE BAR LID, MOUSE, 7115, STAINLESS STEEL, SHEET METAL DESIGN, WITH SQUARE STOPPER GUARD	✓	USD 0.00	1,260.00	USD 0.00
HH35P5-28	CARDHOLDER, 3" X 5", HORIZONTAL, POLYSULFONE HIGH TEMPERATURE PLASTIC, RED, 7115/75JAG/10147-VENT, LID MOUNT STAINLESS STEEL DOUBLE CLIP, FLIP UP	✓	USD 0.00	1,260.00	USD 0.00
EFS115GRB0-3R4E	BLOWER, SUPPLY, ECOFLO, 115V, WIVARIUM, GREY, BLUE LABEL, BLUETOOTH, NORTH AMERICA TWIST LOCK NEMA L5-20P CORD SET, ENGLISH	✓	USD 0.00	18.00	USD 0.00
MB0JV060CD-0700	IVC, Mouse, 60 Cage 75J, Vent, Rear Plenums 4" Exhaust (Left) & 4" Supply, Solid Platforms, Edstrom Stainless Steel Automated Watering With Removable Valve (SHR Design), 5" x 2" HT Phenolic Casters, Edstrom Cage Locks, Single Face, 6 Columns x 10 Tiers	☐	USD 17,850.00	9.00	USD 160,650.00
PC75JHTSH	CAGE, MOUSE, 75JAG, HIGH TEMPERATURE PLASTIC, H2O SH(R), KUP	✓	USD 0.00	540.00	USD 0.00
MBT7115RHHR	MICRO BARRIER TOP, MOUSE, 7115, REDUCED HEIGHT, HIGH TEMPERATURE PLASTIC, REEMAY FILTER, BLUE HINGED RETAINER	✓	USD 0.00	540.00	USD 0.00
WBL7115SMD-AMG	WIRE BAR LID, MOUSE, 7115, STAINLESS STEEL, SHEET METAL DESIGN, WITH SQUARE STOPPER GUARD	✓	USD 0.00	540.00	USD 0.00
HH35P5-28	CARDHOLDER, 3" X 5", HORIZONTAL, POLYSULFONE HIGH TEMPERATURE PLASTIC, RED, 7115/75JAG/10147-VENT, LID MOUNT STAINLESS STEEL DOUBLE CLIP, FLIP UP	✓	USD 0.00	540.00	USD 0.00
EFS115GRB0-3R4E	BLOWER, SUPPLY, ECOFLO, 115V, WIVARIUM, GREY, BLUE LABEL, BLUETOOTH, NORTH AMERICA TWIST LOCK NEMA L5-20P CORD SET, ENGLISH	✓	USD 0.00	9.00	USD 0.00
WICOM-TABLET	TABLET, WICOM, COVER, BLACK	☐	USD 800.00	14.00	USD 11,200.00
PC75JHTSH	CAGE, MOUSE, 75JAG, HIGH TEMPERATURE PLASTIC, H2O SH(R), KUP	☐	USD 29.90	3,460.00	USD 103,454.00
MBT7115RHHR	MICRO BARRIER TOP, MOUSE, 7115, REDUCED HEIGHT, HIGH TEMPERATURE PLASTIC, REEMAY FILTER, BLUE HINGED RETAINER	☐	USD 13.25	3,460.00	USD 45,845.00
	WIRE BAR LID, MOUSE, 7115, STAINLESS STEEL, SHEET METAL		USD		USD

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BUDGET DETAILS
(continued)

WBL7115SMD-AMG	DESIGN, WITH SQUARE STOPPER GUARD		15.35	3,460.00	53,111.00
HH35P5-28	CARDHOLDER, 3" X 5", HORIZONTAL, POLYSULFONE HIGH TEMPERATURE PLASTIC, RED, 7115/75JAG/10147-VENT, LID MOUNT STAINLESS STEEL DOUBLE CLIP, FLIP UP		USD 5.25	3,460.00	USD 18,165.00
PC15/17BHT-8	BOTTLE, 15/17 OZ, HIGH TEMPERATURE PLASTIC, #8		USD 6.00	6,920.00	USD 41,520.00
SPL48RS-6	SPIN ON LID ASSEMBLY WITH 2.5" SIPPER TUBE NO BALL		USD 5.00	6,920.00	USD 34,600.00
BB2015/17MR	BASKET, BOTTLE, 15/17, 20 COMPARTMENT, STAINLESS STEEL, WITH MESH RETAINER, 18.500" W X 12.750" D X 13.687"H		USD 280.00	40.00	USD 11,200.00
DBB2416-B	DOLLY, BOTTLE BASKET (2416M, 2015/17M, 2015/17MR), STAINLESS STEEL CASTERS, NO BRAKES, WITH BLACK PHENOLIC WHEELS, STAINLESS STEEL, WITH PUSH HANDLE		USD 475.00	10.00	USD 4,750.00
X.05.20.1.0006	BASKET, ACCESSORY, INTEGRATED LID, STAINLESS STEEL NOMINAL OVERALL DIMENSIONS 10.512"/267.00mm W X 19.687"/500.05mm D X 5.905"/149.99mm H		USD 465.00	20.00	USD 9,300.00
123732-2	HOSE KIT, FIELD ASSEMBLY, EXHAUST, 36", THIMBLE, EFE/EFV, 4:4		USD 120.00	76.00	USD 9,120.00
213936	LOAD SIMULATOR ASSEMBLY, 4" TO 4", EXHAUST WITH CLAMP NOTE - SETTING MUST BE SPECIFIED AT TIME OF ORDER		USD 140.00	76.00	USD 10,640.00
216008	TRANSITION ASSEMBLY, 6" TO 4", CEILING MOUNTED, STAINLESS STEEL		USD 195.00	76.00	USD 14,820.00
IRIS4-GAL	IRIS DAMPER, 4", GALVANIZED		USD 120.00	76.00	USD 9,120.00

Subtotal	USD 2,195,445.00
Tax	USD 203,078.66
Shipping and Handling	USD 52,500.00
Grand Total	USD 2,451,023.66

F.O.B.	Destination
Freight	Prepay & Add
Lead Time	To be determined at point of contract. Deliveries can begin 90-120 Days ARO
Miscellaneous	Estimated tax rate: 9.25%
Allentown Use Only	0001

Any delivery delays incurred due to drawing approvals and/or customer changes may affect quoted delivery times.

Consignee's inability to accept shipment of purchased/contracted items may result in a storage charge to purchaser.

Special freight requirements for unloading such as lift gate, pallet jack, off loading onto special size truck for dock requirements, etc. must be specified upon placement of order. All associated charges related to these special conditions will supersede all freight costs previously quoted unless known at time of quotation and will be sole responsibility of consignee for reimbursement to Allentown, Inc.

COMPLETE SPECIFICATIONS AVAILABLE UPON REQUEST

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BUDGET DETAILS
(continued)

USC — **Hamilton Construction**

HMR Vivarium Renovation — 02 JUNE 2017

Drawings

BY: Design for Science

PROJECT INFORMATION	BLDG S.F.		ANTICIPATED SCHEDULE 8 MONTHS		EMERGENCY GENERATOR	EXTERIOR DUCT SHAFT
Basement	2600					
First Floor	0					
2nd Floor	620					
3rd - 9th floors	5180					
PHASE/FLOOR SQUARE FOOTAGE	5800	S.F.				
DIV 01 GENERAL REQUIREMENTS						
0100 GENERAL REQUIREMENTS			207,684			42,000
DIV 02 INTERIOR MODIFICATIONS						
0207 INTERIOR DEMOLITION			145,000			
DIV 03 CONCRETE						
0372 CONCRETE			10,000			
DIV 05 METALS						
0512 MISCELLANEOUS METALS			140,497			137,997
DIV 07 THERMAL & MOISTURE PROTECTION						
0721 BUILDING INSULATION			2,900			
0721 FIRESTOPPING			12,000			
0750 ROOFING			9,500			
760 SHEETMETAL			12,500			12,500
0790 SEALANTS			9,600			
DIV 08 DOORS & WINDOWS						
0821 DOORS & HARWARE			105,000			
DIV 09 FINISHES						
0925 GYPSUM BOARD / PLASTER			405,000			144,000
0966 EPOXY FLOORING			145,000			
0990 PAINTING			30,700			
0999 CUTTING & PATCHING			44,000			
DIV 10 SPECIALTIES						
1021 SIGANGE			20,300			
1052 FIRE EXT CABINETS			3,800			
1080 WALL GUARDS			32,760			
DIV 11 EQUIPMENT	SEE EQUIPEMNT LIST IN THE MAIN BUDGET					
1100 SS, SCRUB SINKS & INSALLATION	FOR OFCI ONLY		102,200			
DIV 12 FURNISHINGS						
DIV 21 - 23 MECHANICAL					EMERGENCY GENERATOR	EXTERIOR DUCT SHAFT
2200 PLUMBING	EXCLUDING RO/ WATERING EQUIP.		856,667			
2100 FIRE PROTECTION			46,400		GENERATOR	DUCT SHAFT
2300 H V A C			1,662,400			
DIV 26 ELECTRICAL						
2600 ELECTRICAL	INCLUDING EMERGENCY GEN.		793,000		448,000	
2672 FIRE ALARM SYSTEM			30,500			
2800 SECURITY/ITS SCOPE			40,000			
DIV 32 EXTERIOR IMPROVEMENTS						
3280 LANDSCAPE REPAIR			7,500			
TOTAL DIRECT CONSTRUCTION			**4,876,408**	4,876,408	448,000	336,497
GENERAL CONDITIONS (SINGLE PHASE)		10.00%	487,641			
ESTIMATE CONTINGENCY		5.00%	243,820		22,400	16,825
INSURANCE		1.75%	85,337		7,840	5,889
CONTRACTOR FEE		5.00%	284,660		23,912	17,961
SUBTOTAL CONSTRUCTION BUDGET			**5,977,866**		**502,152**	377,171
ALTERNATE DEDUCTION FROM PLUMBING SCOPE RELATED TO FILTER BANK ON THE FLOORS ILO RO SYSTEM - CREDIT FOR RO EQUIPMENT (68k)TO BE CAPTURED IN EQUIPMENT LINE ITEM IN CCD WORK SHEET			**(15,869)**			

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SITE WORK		QUANTITY	UNITS	UNIT COST	TOTAL		
0100	GENERAL REQUIREMENTS						
	TEMPORARY PARTITIONS	100	LF	35	3,500		
	TEMP DRS FRAMES, HDW	4	EA	500	2,000		
	SITE FENCING	1	ALLOW	25,000	25,000		
	TRASH REMOVAL	17	WKS	450	7,799		
	ONGOING CLEANUP @ 24/WK	35	WKS	1,368	47,420		
	SCAFFOLDING	1	LS	42,000	42,000		42,000
	DUST CONTROL	1	LS	23,710	23,710		
	TEMP WEATHER PROTECTION	1	ALLOW	5,000	5,000		
	TEMP PROTECTION LABOR @ 12/WK	35	WKS	684	23,694		
	TEMP PROTECTION MATERIAL	8	MOS	2,250	18,000		
	STORAGE BINS	8	MOS	325	2,600		
	PARKING FEE	8	MOS	870	6,960		
	MISCELLANEOUS		SF	1	0		
	TOTAL					207,684	
0207	DEMOLITION						
	KARCHER ENVIRONMENTAL						
	WALLS & CEILINGS	5800	SF	25	145,000		
	MISC				0		
	TOTAL					145,000	
0372	CONCRETE						
	EQUIPMENT PAD	1	LS	10,000	10,000		
					0		
	TOTAL					10,000	
METALS							
0512	MISCELLANEOUS METALS						
	Misc. Steel for duct shaft	1	ls	137,997	137,997		137,997
	Trench cover @ basement	1	ls	2,500	2,500		
	TOTAL					140,497	
0550	STRUCTURAL STEEL						
0	*MISC METALS-BLDG SQ FT*		SF	1	0		
	MISC				0		
	TOTAL					0	
DIV 07 THERMAL & MOISTURE PROTECTION							
0721	BUILDING INSULATION						
	SOUND INSULATION	5800	SF	0.5	2,900		
	R11 3" FIBERGLASS BATT INSUL		SF		0		
	MISC				0		
	TOTAL					2,900	
0727	FIRESTOPPING						
	FIRESTOPPING-BLDG SQ FT		ALL	1	0		
	MISC MTL @ EXIST PENETRATIONS		ALL	1	0		
	MISC LABOR @ EXIST PENETRATION	160	HRS	75	12,000		
	TOTAL					12,000	
0750	ROOFING						
	ROOFING AT EXHAUST FAN	1	LS	9,500	9,500		
	MISC SUPPORTS		LS		0		
	TOTAL					9,500	
0760	SHEET METAL						
	SHEET METAL-BLDG SQ FT		SF	1	0		
	MISC SUPPORTS	1	LS	12,500	12,500		12,500
	TOTAL					12,500	
0741	METAL PANELS						
	METAL SIDING ROOF SCREEN - GES		ROM		0		
	MISC SUPPORTS		LS		0		
	TOTAL					0	
0790	SEALANTS						
	MISC CAULKING, ROOF PENETRATIO	128	HRS	75	9,600		
	FIRESTOPPING						
	MISC				0		
	TOTAL					9,600	

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BUDGET DETAILS
(continued)

DIV 08 DOORS & WINDOWS							
0821	WOOD DOORS & FINISH HARDWARE						
0	*HM DR FRAMES-BLDG SQ FT*		EA	1	0		
	3 0 X 8 0 DOORS & HARDWARE	12	EA	3,500	42,000		
	6 0 X 8 0 DOORS & HARDWARE	2	EA	6,500	13,000		
	LP - SLAIDING DOOR @ BASEMENT	1	EA	50,000	50,000		
	TOTAL					105,000	
0830	ACCESS PANELS		No Access Panels are required				
	ACCESS PANELS-BLDG SQ FT		EA	0	0		
	MISC @ GYP CEILINGS		EA	675	0		
	TOTAL					0	
0841	GLASS & GLAZING						
	RED GLASS VIEW WINDOW W/ FRAM	10	EA	150	1,500		
	VENDOR		ALL		0		
	3X7 STOREFRONT ALUM DOOR				0		
					0		
	TOTAL					1,500	
DIV 09 FINISHES			IN DRYWALL				
0920	LATH & PLASTER						
	PLASTER CRACK REPAI		EA	350	0		
	SHAFT WALL REPAIR		LS		0		
	TOTAL					0	
0925	GYPSUM BOARD CONSTRUCTION						
	INT STUD & DRYWALL-BLDG SQ FT				0		
	WALL FRAMING / DRYWALL	5800	SF	20	116,000		
	CEILING FRAMING / DRYWALL	5800	SF	25	145,000		
	EXTERIOR DUCT SHAFT	9	FLOORS	16,000	144,000		144,000
	TOTAL					405,000	
0966	EPOXY FLOORING						
	BUDGET	5800	SF	25	145,000		
	TOTAL					145,000	
0968	CARPETING						
	VENDOR		BID		0		
	TOTAL					0	
0990	PAINTING						
	EPOXY PAINTING - WALLS & CEILINC	5800	SF	4	23,200		
	PAINT ADJACENT AREAS	1	ALLOW	7,500	7,500		
	TOTAL					30,700	
0999	CUTTING & PATCHING						
	BUDGET	8	FLOORS	5,500	44,000		
	TOTAL					44,000	
DIV 10 SPECIALTIES							
1021	SIGNAGE						
	MISC	5800	SF	3.5	20,300		
	TOTAL					20,300	
1052	FIRE EXT CABINETS						
	FIRE EXT CABINETS	8	EA	475	3,800		
					0		
	TOTAL					3,800	
1080	WALL GUARDS						
	BUDGET	7	FLOOR	4,680	32,760		
	BACKING /			0	0		
	TOTAL					32,760	
DIV 11 EQUIPMENT			RO Equipment outside of constrcution budget				
1100	MISCELLANEOUS EQUIPMENT						
	STAINLESS STEEL SINK	10	EA	2,500	25,000		
	SCRUB SINK	1	EA	6,400	6,400		
	SHIELDING DRYHEAT STERILIZER	1	ALLOW	10,000	10,000		
	OWNER FURNISHED/CONT INST (ofc	640	HRS	95	60,800		
	TOTAL					102,200	
DIV 12 FURNISHINGS							
1225	WINDOW TREATMENT/CURTAINS						
	VENDOR		BID	27,065	0		
	MISC		SF		0		
	TOTAL					0	
DIV 21, 22 MECHANICAL							
2200	MUIR- CHASE PLUMBING						
	INSTALLATION OF AUTO WATERING	1	LS	69,837	69,837		
	PLUMBING FOR TUNNEL WASHER	1	LS	69,971	69,971		
	PLUMBING FOR STEAM BOILER	1	LS	46,545	46,545		
	AUTOMATIC WATERING PIPING FLOORS 2-7 & 9	1	LS	234600	234600		
	BASE PLUMBING FLOORS 3-7 & 9	1	LS	286437	286437		
	SURGERY/ PROCEDURE ROOMS (Floor 8)	1	LS	119277	119277		
	LEVEL -1 ALLOWANCE	1	LS	25000	25000		
	SAFEOFF / DISCONNECT TANK & ROOF	1	LS	5000	5000		
	TOTAL					856,667	
2100	FIRE PROTECTION						
	BUDGET	5800	SF	8	46,400		
	TOTAL					46,400	
2300	H V A C						
	ACCO ENGINEERING						
	Air Distribution	100		100	10,000		
	Combination Fire/Smoke Dampers	20		510	10,200		
	Laboratory Airflow Control Valves	254		1,125	285,750		
	Steam Generator	1		25,100	25,100		
	Tunnel Washer Exhaust Fan	1		6,600	6,600		
	Galvanized Fabrication Shop	1		36,100	36,100		
	Welded Galvanized Shop	1		15,550	15,550		
	304 SS Stainless Steel Duct Shop	1		102,000	102,000		
	Teamster - Loading & Delivery	1		10,300	10,300		
	Sheetmetal Supervision and BIM Coordination	1		129,600	129,600		
	Sheetmetal Field Installation	1		280,780	280,780		
	Equip.Connections - Cages (includes futures), Cage Washers, Fume Hoods, Bio Safety Cabinets	96		420	40,320		
	Piping Materials	1		17,600	17,600		
	Piping Supervision and BIM Coordination	1		89,000	89,000		
	Piping Field Installation	1		76,500	76,500		
	Rigging and Crane Rental	1		11,500	11,500		
	Systems Operation Startup	1		24,300	24,300		
	Air and Water Balance	1		79,600	79,600		
	Engineering - Project Management	1		41,900	41,900		
	DDC Controls	1		40,250	40,250		
	Lab Controls	1		219,000	219,000		
	Insulation	1		34,500	34,500		
	Firestopping	1		6,750	6,750		
	Water Treatment	1		2,800	2,800		
	Rentals, storage, office & supplies, permit, trucks & misc.	1		66,400	66,400		
	TOTAL					1,662,400	
DIV 26 ELECTRICAL							
2602	SIERRA PACIFIC						
	Basement	1		15,000	15,000		
	Level 3 - 7 Lighting	5		10,000	50,000		
	Level 3- 7 Distribution	5		45,000	225,000		
	Level 9	1		40,000	40,000		
	Generator	1		250,000	250,000	250,000	
	ATS Switch	1		25,000	25,000	25,000	

	New Distribution	1		25,000	25,000		25,000	
	Subpanels	6		8,000	48,000		48,000	
	Coring	1		90,000	90,000		90,000	
	Pad / Sitework	1		10,000	10,000		10,000	
	AHU / Exhauts Requirements	1		15,000	15,000			
	MISC				0			
	TOTAL					793,000		
2672	FIRE ALARM SYSTEM-Misc added devices only. Hi-rise building upgrade NIC							
	Fire Alarm	5800	sf	5	29,000			
	INSPECTION / HVAC COORDINATION	1	ALLOW	1,500	1,500			
	TOTAL					30,500		
DIV 28	SECURITY/ITS SCOPE							
3280	IT CLOSET & INFRASTRUCTURE							
	SECURITY/ACCESS RACEWAYS	1	ALLOW	20,000	20,000			
	IT CLOSET & INFRASTRUCTURE	1	ALLOW	20,000	20,000			
	TOTAL					40,000		
DIV 32	**EXTERIOR IMPROVEMENTS**							
3280	LANDSCAPE & IRRIGATION							
	REPAIR EXISTING	1	LS	7,500	7,500			
			ALLOW		0			
	TOTAL					7,500		
DIV xx	**ADDED ITEMS**	SEE EQUIPMENT BUDGET IN CCD BUDGET						
xxxx	xyz						EMERGENCY GENERATOR	EXTERIOR DUCT SHAFT
			BID		0			
			BID		0			
	TOTAL					0	448,000	336,497

Bid Summary

USC MHR Viv Renovation

Bid No. 23

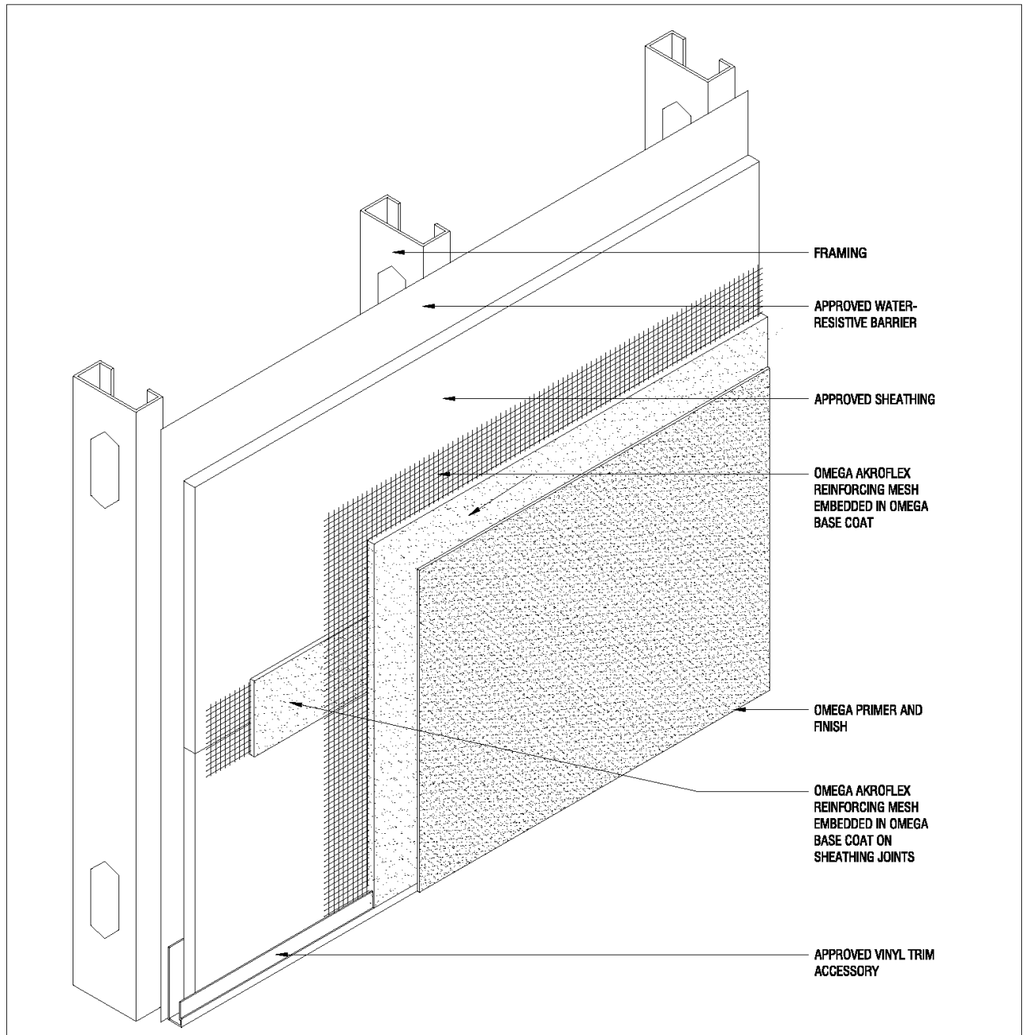
Selected Sections: 07210 Building Insulation, 07240 EIFS PB System, 09110 Interior Wall Framing, 09250 Drywall
Selected Typical Areas:
Selected Areas: (unassigned)

Estimator:
Job Class:
Wage Type: **Union**

Job Status: **Pending**
Bid Date/Time: **6/6/2017 9:27:37 AM**
Plans Date: **6/6/2017**

No.	Condition	Height	Quantity	Unit Price	Total Price	Man Days
1	WALL TO 10'6"	10' 6"	26.85 LF	483.02 / LF	12,968.13	14.44
2	JOIST TO 20'	20' 0"	37.08 LF	24.58 / SF	18,233.77	18.83
3	SCAR PATCH		3.00 EA	353.83 / EA	1,061.48	1.32
				Material & Labor Total:	**32,263.38**	**34.58**
				Grand Total:	**32,263.38**	**34.58**

TYPICAL
3RD FLOOR



THE ARCHITECTURE, ENGINEERING, AND DESIGN OF THE PROJECT USING OMEGA PRODUCTS IS THE RESPONSIBILITY OF THE PROJECT'S DESIGN PROFESSIONAL. ALL SYSTEMS MUST COMPLY WITH LOCAL BUILDING CODES AND STANDARDS. THIS DETAIL IS FOR GENERAL INFORMATION AND GUIDANCE ONLY, AND OMEGA INC. SPECIFICALLY DISCLAIMS ANY LIABILITY FOR THE USE OF THIS DETAIL AND FOR THE ARCHITECTURE, DESIGN, ENGINEERING, OR WORKMANSHIP OF ANY PROJECT. THE PROJECT DESIGN PROFESSIONAL DETERMINES, IN ITS SOLE DISCRETION, WHETHER THIS DETAIL OR A FUNCTIONALLY EQUIVALENT ALTERNATIVE IS BEST SUITED FOR THE THE PROJECT. USE OF A FUNCTIONALLY EQUIVALENT DETAIL DOES NOT VIOLATE OMEGA'S WARRANTY. THIS DETAIL IS SUBJECT TO CHANGE WITHOUT NOTICE. CONTACT OMEGA TO INSURE YOU HAVE THE MOST RECENT VERSION.

ΩMEGA
PRODUCTS INTERNATIONAL

CORPORATE OFFICE
1681 CALIFORNIA AVE., CORONA, CA 92881
E-MAIL: INFO@OMEGA-PRODUCTS.COM
WEBSITE: WWW.OMEGA-PRODUCTS.COM

AKROGOLD DEF SYSTEM DETAIL

APPLICATION OVER APPROVED SHEATHING

SCALE: 3"=1'-0"	DRAWING NO.: AGS 01.00	DRAWN: JUNE 2009

Muir-Chase Plumbing Co.
4530 Brazil St.
Los Angeles, CA 90039
818 500-1940 / FAX: 818 500-0397

BUDGET (2R)

BY: BOB LUNA ***DATE: 6/2/17*** ***JOB#:***

CONTRACTOR: HAMILTON CONSTRUCTION ATTN: NASSER

JOB NAME: USC- HMR VIVARIUM RENOVATION **BUDGET TOTAL $856,667**
JOB ADDRESS: LOS ANGELES
PER DRAFT-3, FEASABILITY STUDY 5-8-17

AUTOMATIC WATERING PIPING (BASEMENT) **$69,837**
(LABOR / INSTALLATION ONLY- MATERIAL OFCI)

QTY.	DESCRIPTION
2	WATER SUPPLY / FUTURE VALVES
2	PRESSURE REDUCING STATIONS
62	INTERCONNECT STATIONS
200	MAIN SUPPLY / RETURN PIPING- SS SWEDGELOCK
	(REPLACE EXISTING PIPING)
INCL	PARKING
INCL	ASBUILTS / SUBMITTALS
INCL	DEMO EXISTING
INCL	INSPECTIONS / TESTING
INCL	LAYOUT / COORDINATION
	WORK FIGURED FOR NORMAL HOURS

BASEMENT TUNNEL WASHER **$69,971**
(EQUIPMENT- NIC BY OTHERS)

QTY.	DESCRIPTION
2	HW / CW SUPPLY / BACKFLOW DEVICE
1	FLOOR SINK FOR EQUIPMENT DRAIN
1	EQUIPMENT WATER / DRAIN CONNECTIONS
INCL	COLD WATER PIPING ALLOWANCE
INCL	HOT WATER PIPING ALLOWANCE
INCL	ACID WASTE / VENT
INCL	STEAM SUPPLY / RETURN PIPING
INCL	CORING / FIRESTOPPING
INCL	CONCRETE DEMO / REMOVAL
INCL	EXCAVATION / BACKFILL
INCL	SLAB SCANNING FOR CORING
INCL	CONNECTIONS TO EXISTING GAS, VAC & WATER
INCL	CONNECTIONS TO EXISTING AW & AV
INCL	OFF-HOURS FOR AW / POC'S / DEMO
INCL	PARKING
INCL	ASBUILTS / SUBMITTALS
INCL	INSPECTIONS / TESTING
INCL	LAYOUT / COORDINATION
	WORK FIGURED FOR NORMAL HOURS

Muir-Chase Plumbing Co.
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Los Angeles, CA 90039
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BUDGET (2R)

BASEMENT STEAM BOILER RI & C **$46,545**
(EQUIPMENT NIC BY OTHERS)

QTY.	DESCRIPTION
1	WATER SUPPLY / BACKFLOW DEVICE
1	FLOOR SINK FOR EQUIPMENT DRAIN
1	EQUIPMENT WATER / DRAIN CONNECTIONS
INCL	COLD WATER PIPING ALLOWANCE
INCL	WASTE / VENT
INCL	STEAM PIPING
INCL	CORING / FIRESTOPPING
INCL	CONCRETE DEMO / REMOVAL
INCL	EXCAVATION / BACKFILL
INCL	SLAB SCANNING FOR CORING
INCL	CONNECTIONS TO EXISTING GAS, VAC & WATER
INCL	CONNECTIONS TO EXISTING W & V
INCL	OFF-HOURS FOR AW / POC'S / DEMO
INCL	PARKING
INCL	ASBUILTS / SUBMITTALS
INCL	INSPECTIONS / TESTING
INCL	LAYOUT / COORDINATION
	WORK FIGURED FOR NORMAL HOURS

AUTOMATIC WATERING PIPING (FLOORS 2 THRU 7 & 9) **$234,600**
(LABOR / INSTALLATION ONLY- MATERIAL OFCI)

QTY.	DESCRIPTION
8	WATER SUPPLY / FUTURE VALVES
7	PRESSURE REDUCING STATIONS
82	INTERCONNECT STATIONS
7	FLOOR SINKS W/ AUTO TRAP PRIMERS
	(FOR SYSTEM DRAIN DOWN)
INCL	ANIMAL WATERING PIPING
INCL	ACID WASTE- FUSION JOINT
INCL	ACID VENT- FUSION JOINT
INCL	COLD WATER SUPPLY
INCL	CORING / FIRESTOPPING
INCL	SLAB SCANNING FOR CORING
INCL	PARKING
INCL	ASBUILTS / SUBMITTALS
INCL	INSPECTIONS / TESTING
INCL	LAYOUT / COORDINATION
	WORK FIGURED FOR NORMAL HOURS

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Los Angeles, CA 90039
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BUDGET (2R)

BASE PLUMBING (FLOORS 3-7 & 9) **$286,437**

QTY.	DESCRIPTION
11	SINKS W/ FAUCETS
6	EMERGENCY SHOWER / EYEWASH
6	THERMOSTATIC MIXING VALVES
6	FLOOR DRAINS W/ AUTO TRAP PRIMERS
INCL	ACID WASTE- FUSION JOINT
INCL	ACID VENT- FUSION JOINT
INCL	COLD WATER SUPPLY
INCL	HOT WATER SUPPLY W/ INSULATION
INCL	SLAB CORES / FIRESTOPPING
INCL	SLAB SCANNING FOR CORING
INCL	PARKING
INCL	ASBUILTS / SUBMITTALS
INCL	INSPECTIONS / TESTING
INCL	LAYOUT / COORDINATION

WORK FIGURED FOR NORMAL HOURS

SURGERY / PROCEDURE ROOMS (FLOOR-8) **$119,277**

QTY.	DESCRIPTION
6	C02 OUTLETS
6	O2 OUTLETS
1	02 AUTOMATIC MANIFOLD (BOTTLES BY OTHERS)
1	C02 AUTOMATIC MANIFOLD (BOTTLES BY OTHERS)
1	SCRUB SINK W/ FAUCET
1	SINKS W/ FAUCETS
1	EMERGENCY SHOWER / EYEWASH
1	THERMOSTATIC MIXING VALVES
1	FLOOR DRAINS W/ AUTO TRAP PRIMERS
INCL	AW / AV PIPING
INCL	OXYGEN PIPING
INCL	C02 PIPING
INCL	SLAB CORES / FIRESTOPPING
INCL	SLAB SCANNING FOR CORING
INCL	PARKING
INCL	ASBUILTS / SUBMITTALS
INCL	INSPECTIONS / TESTING
INCL	LAYOUT / COORDINATION

WORK FIGURED FOR NORMAL HOURS

LEVEL-1 MECHANICAL ROOM RENOVATION **$25,000**
(NO SCOPE IDENTIFIED)

ROOF LEVEL TANK DISCONNECT / SAFEOFF **$5,000**
(DEMO / REMOVAL BY OTHERS)

Muir-Chase Plumbing Co.
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BUDGET (2R)

EXCLUSIONS: OVERTIME, EXISTING PLUMBING CONDITIONS, ENGINEERING, PLAN CHECK, FIRE PROTECTION, WATERPROOFING, ASBESTOS CONDITIONS, SHUT-DOWN AND START-UP OF EXISTING UTILITIES, STRUCTURAL WORK, WORK NOT DESCRIBED ABOVE, LIQUIDATED DAMAGE, EXPEDITED SCHEDULE, BONDS, BIM COORDINATION, MECHANICAL WORK, CONDENSATES, OWNER FURNISHED LAB EQUIPMENT, PROTECTION OF THE EXISTING AREAS OCCUPIED DURING CONSTRUCTION, PHASING, ROOF PATCH, FIRE SPRINKLER WORK, FUME HOODS, EXISTING LAB GASES, GAS CYLINDER RACKS AND BOTTLES, LAB SINKS & FAUCETS, DI SPOUTS, CAGE WASH OR SPRAYERS. STEAM PIPING, TUNNEL WASHER, STEAM GENERATOR.

ALTERNATE ADD ALLOWANCES

ADDED FLOOR DRAINS IN CAGE HOLDING (3-7 & 9) **$235,330**
(FOR EMERGENCY / SPILLAGE ETC)

ALTERNATE ALLOWANCE

WATER SYSTEM (FLOORS 2-7 & 9) PER EDSTROM **$220,442**
OPTION-3

acco engineered systems

818 / 244-6571 Voice
818 / 247-6533 Fax
6265 San Fernando Road
Glendale, California
91201-2214

June 2nd, 2017

Mr. Nasser Ghotbi
Hamilton Construction
202 Mercury Circle
Pomona, CA 91768

VIA EMAIL; REVISED 6/2/17

Re: USC HMR Vivarium Renovation
Budget Proposal for HVAC Installation

Dear Nasser:

We are pleased to offer you the following HVAC budget proposal for the USC HMR Vivarium Renovation located in Los Angeles, CA. Our proposal is based on the feasibility study provided by Design for Science dated 5/8/17. No other information was provided. The following is included in our proposal:

- Safeoff for complete demolition by others.
- Provide mechanical shop drawings from provided CAD files based on field conditions and trade coordination for review and approval by the architect and engineer.
  - We've included sixty (60) working days of 3D BIM coordination participation.
- Provide mechanical submittals for all equipment, ductwork, ductwork accessories, piping, piping trim, vibration isolation, and seismic restraint (as required).
- Items furnished and installed by ACCO:
  - (254) laboratory airflow control valves for a double duct hot deck/cold deck system on the supply side only.
  - Twenty (20) combination fire/smoke dampers.
  - One (1) tunnel washer roof mounted exhaust fan.
  - One (1) steam to steam heat exchanger.
  - Standard hardlid style air distribution with remote damper operators as required.
- Furnish and install steam piping and condensate drains.
  - Steam piping will be socket welded schedule 40 304 stainless steel.
    i. We've included hookups to three (3) pieces of steam equipment in the cage wash area.
- Fabricate and install supply air ductwork, return air ductwork, and exhaust air ductwork per SMACNA standards.
  - All supply air duct upstream of the laboratory airflow control valves is 4" pressure class galvanized duct.
  - All supply air duct downstream of the laboratory airflow control valves is 2" pressure class galvanized duct.
  - All viviarum exhaust duct is flanged/gasketed/bolted #2 finish 18 gauge 304 SS with galvanized flanges.
  - All ductwork will be delivered to the jobsite wiped down from our fabrication shop covered in plastic.
  - Duct pressure testing is included for supply/exhaust air mains upstream of the terminal units.
    i. 25% of supply air duct mains and 50% of exhaust air duct mains are included.
  - All welded duct is wire fed MIG welded with #2 finish.
- Furnish and install pipe/duct insulation inclusive of duct firewrap.
- Provide startup and forty (40) hours for commissioning assistance of mechanical equipment.
- Provide air balance by an independent AABC or NEBB certified subcontractor.

acco engineered systems

- DDC controls by Honeywell.
- Laboratory airflow controls by Phoenix Controls or Triatek.
- Union labor during normal work hours with labor rates valid through 12/31/18.
- Parking.
- Permit fees.
- Provide as built drawings, equipment startup reports, one (1) year warranty, installation, operation, and maintenance manuals, and air/water balance reports to the owner upon completion and turn over.

Clarifications:

- We assume our work will be installed in a continuous manner prior to framing/drywall installation but after all demolition has occurred.
- All laboratory airflow control valves will be screwed and sealed or clamped. No welding is included.
- ACCO's proposal is based on install our sheetmetal mains prior to any walls being built.
- Our price included 304 stainless steel duct with a #2 finish and galvanized flanges.
- We will require an accurate 3D model of the building and MEPF systems and assume the other trades are capable of performing this task.
  - 3D BIM coordination will be done in the Autocad platform, not REVIT.
  - Any hours above the scheduled duration used will be assessed at that time for cost impacts.
  - We also assume that all lab equipment requiring MEPF connections will be accurately located in the model.
- We may require access to ceiling spaces in existing areas where we are to install our work. We assume this to be provided by others.
- We assume shaft access will be provided for our work and can be performed on normal hours.
- We assume that all existing mechanical equipment currently has the capacity for the renovation and do not need repair, maintenance, or replacement.
- We have included connections to the cages and vented cabinets that are furnished and installed by others.
- ACCO will furnish access doors for our equipment for installation by others.
- We assume that the existing/new structure can support the mechanical equipment as approximately located on the mechanical drawings.
- We assume that all electrical work 120 volts and higher is provided and installed by others.
- We assume that all exposed 24 volt control wire will be installed within EMT conduit and all concealed 24 volt control wiring will be loose plenum rated wire.
- We assume that all interlock wiring regardless of voltage will be installed by others.

Equipment Lead Times:

- Laboratory airflow control valves – four (4) to six (6) weeks.
- Exhaust fan – four (4) to six (6) weeks.
- Steam to steam heat exchanger – eight (8) to ten (10) weeks.
- Air distribution, combination fire/smoke dampers, and control dampers – four (4) weeks.

Exclusions:

- General contracting work: cutting, patching, roofing and roofing repair, roof cutting, painting, concrete, concrete curbs/pads, building openings, structural supplementary steel, wood framing, scaffolding, waterproofing, flashings, pad covers, etc.
- Special inspection of anchors.
- Plan check fees.
- Piping related items: expansion and contraction calculations, hanger design, riser support design, spring hangers, and anchor/guide design.

BUDGET DETAILS
(continued)

- Ductwork related items: duct cleaning, duct support design, and antimicrobial duct coating, stainless steel supports, lined variable air volume box plenums, hard duct connections to air distribution within ceilings, heliarc welding, #4 finish stainless steel duct, welded laboratory exhaust valves, IAQ testing.
- Commissioning documentation.
- Safeoff, demolition, and asbestos abatement of any kind.
- Flashings and/or escutcheons for pipe penetrations, duct penetrations, and equipment.
- Seismic certification of any mechanical equipment.
- All electrical conduit and electrical wiring 120 volts and higher, motor starters, interlock wiring, mounting/installation of variable speed drives, etc.
- Any and all plumbing work except as included above.
- Fire/life safety and fire alarm system design and related installation work.
- Overtime work and weekend work.

USC Broad Center Vivarium Expansion Budget HVAC Pricing: **$ 1,657,000**

Add Alternates:
- Performance and payment bond: $ 14,300

Please feel free to contact us at your earliest convenience should you have any questions or concerns.

Very truly yours,

Josh Kee, PE
Senior Project Manager
ACCO Engineered Systems

Mike Lopez
Senior Project Manager
ACCO Engineered Systems

USC HMR Vivarium Renovation — **06/02/17**
Los Angeles, CA — **Sq. Ft.** — **$/Sq. Ft.**
Trade - HVAC — **5,780** — **$ 286.68**

DESCRIPTION	Units	Unit Cost	6/2/17 Budget Cost
Air Distribution	100	$ 100	$ 10,000
Combination Fire/Smoke Dampers	20	$ 510	$ 10,200
Laboratory Airflow Control Valves	254	$ 1,125	$ 285,750
Steam Generator	1	$ 25,100	$ 25,100
Tunnel Washer Exhaust Fan	1	$ 6,600	$ 6,600
Galvanized Fabrication Shop	1	$ 36,100	$ 36,100
Welded Galvanized Shop	1	$ 15,550	$ 15,550
304 SS Stainless Steel Duct Shop	1	$ 102,000	$ 102,000
Teamster - Loading & Delivery	1	$ 10,300	$ 10,300
Sheetmetal Supervision and BIM Coordination	1	$ 129,600	$ 129,600
Sheetmetal Field Installation	1	$ 280,780	$ 280,780
Equip.Connections - Cages (includes futures), Cage Washers, Fume Hoods, Bio Safety Cabinets	96	$ 420	$ 40,320
Piping Materials	1	$ 17,600	$ 17,600
Piping Supervision and BIM Coordination	1	$ 89,000	$ 89,000
Piping Field Installation	1	$ 76,500	$ 76,500
Rigging and Crane Rental	1	$ 11,500	$ 11,500
Systems Operation Startup	1	$ 24,300	$ 24,300
Air and Water Balance	1	$ 79,600	$ 79,600
Engineering - Project Management	1	$ 41,900	$ 41,900
DDC Controls	1	$ 40,250	$ 40,250
Lab Controls	1	$ 219,000	$ 219,000
Insulation	1	$ 34,500	$ 34,500
Firestopping	1	$ 6,750	$ 6,750
Water Treatment	1	$ 2,800	$ 2,800
Rentals, storage, office & supplies, permit, trucks & misc.	1	$ 66,400	$ 61,000
Total Base Bid Budget			**$ 1,657,000**

BUDGET DETAILS
(continued)

TELEPHONE QUOTATION

Specialists in Health Care Construction

202 Mercury Circle
Pomona, California
91768

[909] 594-7523
[909] 594-2794 Fax

HAMILTON CONSTRUCTION

Date: 5/9/2017

Project: **USC - HMR Vivarium**

Contractor: Sierra

Name: Jose r.

Telephone:

City:

Work Description:
Electrical

Specification Recent Lab Projects Per Room 55,000.00

Sections:

BUDGET $793,000.00

Desrcribtion	Qty	Cost	Extension
Basement	1	15,000	$15,000.00
Level 3 - 7 Lighting	5	10,000	$50,000.00
Level 3- 7 Distribution	5	45,000	$225,000.00
Level 9	1	40,000	$40,000.00
Generator	1	250,000	$250,000.00
ATS Switch	1	25,000	$25,000.00
New Distribution	1	25,000	$25,000.00
Subpanels	6	8,000	$48,000.00
Coring	1	90,000	$90,000.00
Pad / Sitework	1	10,000	$10,000.00
AHU / Exhauts Requirements	1	15,000	$15,000.00
Total			$793,000.00

By:

Edstrom

QUOTE NO: 102275 Rev B
PAGE 1 OF 8

TO: University of Southern California
1501 San Pablo St.
B104A
Los Angeles, CA 90033-1034

ATTN: Mr. Ramiro Montano
(323) 442-4301 Phone
rmontano@usc.edu

DATE: May 15, 2017
TERMS: Net 30 Days
MATERIAL DELIVERY: 8 Weeks After Receipt of Approved Submittal Package
F.O.B.: Waterford, WI
Freight Prepaid

RE: **EDSTROM STAINLESS STEEL ANIMAL WATERING SYSTEM FOR HOFFMANN MEDICAL RESEARCH VIVARIUM**

BUDGETARY ESTIMATE

Floor	Room	PCCX	IO Panel	PRS	IC's	OLRF
Basement	B17	1		1	1	
Basement	B15				9	
Basement	B13				9	
Basement	B11				8	
Basement	B6A			1	10	
Basement	B6B				12	
Basement	B6C				7	
Basement	B6D				6	
3rd floor	317	1		1		9
3rd floor	314					4
4th floor	417		1	1		9
4th floor	416					4
5th floor	515	1		1		9
5th floor	514					4
6th floor	617		1	1		9
6th floor	616					4
7th floor	717	1		1		9
7th floor	716					4
9th floor	916		1	1		4
TOTAL		**4**	**3**	**8**	**62**	**69**

Template:F-000202, Rev D

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Fax 262 534 5184
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Edstrom

QUOTE NO: 102275 Rev B
PAGE 2 OF 8

1. -4- Pulse CMC™ Central Controller Panel (PCCX) with internal Power Supply, Modem, I/O block and Ethernet Switch. Painted steel panel to be surface mounted in an accessible area.

2. -3- Pulse CMC™ Input/Output (I/O) Panel for digital and analog signals. Painted steel panel to be surface mounted in an accessible area.

3. -3- Pulse CMC™ Power Supply Unit for I/O blocks. One required per I/O panel.

4. -7- Pulse CMC™ Power Supply Unit for LON Devices.

5. -8- Pressure Reducing Stations Model 8550 equipped with auto flush and monitoring features, a shut-off valve and an injection port for system sanitization furnished with a surface mounted stainless steel cabinet.

6. -62- Interconnect stations each equipped with stainless steel quick disconnect couplings. This includes a Clean Joint Stainless Steel Room Distribution Piping System complete with 1/2" plastic standoff brackets and mounting hardware. **Does not include hoses.**

7. -69- On-line rack flush interconnect stations each equipped with a detachable Kynar recoil supply hose with stainless steel quick disconnect couplings and a fixed Kynar recoil drain hose with stainless steel quick disconnect coupling. A stainless steel solenoid flush valve with a mounting bracket is included. This includes a Clean Joint Stainless Steel Room Distribution supply and drain piping system complete with 1/2" plastic standoff brackets and mounting hardware. The drain header extends to a sink or floor drain within the animal room or as designated.

8. -1 lot- Stainless steel room distribution piping.

BUDGETARY ESTIMATE FOR STAINLESS STEEL ANIMAL WATERING SYSTEM AS DESCRIBED ABOVE:

MATERIAL AND PREFABRICATION ONLY: $ 273,553.33
CONTRACTOR HOURS: 636 HOURS

OPTION:

9. -1- Edstrom Indigo RO Reverse Osmosis System to include the following:

- -1- Indigo RO Reverse Osmosis System with a permeate capacity of 2606 gallons/day
- -1- Activated Carbon Filter for pretreatment before a Reverse Osmosis System. Continuous service flow capacity is 2.1 gallons per minute
- -1- Automated membrane flush system
- -1- Microprocessor-based controller with graphical user interface
- -1- Conductivity monitoring system with automated shut-down control
- -1- Treated water storage tank
  Capacity: 600 gallons each
- -2- Purified Water Distribution Pumps, skid mounted, 2 HP
- -1- Pressure Tank
- -1- Post Treatment chemical injection

Template:F-000202, Rev D

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-1 Lot- Interconnecting piping and by-pass loop with 5 micron filter
-1 Lot- Stainless steel piping system originating at the Reverse Osmosis System and terminating at (8) Pressure Reducing Stations

Note: Header piping between floors by others.

Proposed location of System: TBD

NOTE: Provide one TCP/IP connection which includes 2 static IP addresses, IP subnet mask, IP gateway address, and DNS (domain name server). One static IP address for Touchscreen and one static IP address for the Indigo RO Smart Server. Compatible with Windows Internet Explorer 9, 11 or Chrome 22.0.1229.96 browsers if the Web Server is being used.

BUDGETARY ESTIMATE FOR OPTIONAL RO SYSTEM AS DESCRIBED ABOVE:

MATERIAL AND PREFABRICATION ONLY:	**$ 83,877.75**
CONTRACTOR HOURS:	**170 HOURS**

Other Items Included:

1. Edstrom Contractor Installation Kit to include installation aids, drawings, and operating manuals. Also included are the required wiring diagrams, submittal drawings, and standard specifications.

2. Supervision by Edstrom personnel for Animal Watering and RO installation, start-up, and final check-out of equipment as furnished by Edstrom with a maximum of 3 separate trips to job-site and up to 8 days at the job-site. This supervision is automatically included in the equipment cost. If additional supervision will be required, charges are to be negotiated with Edstrom.

3. -1- Preventive Maintenance site visit by Edstrom personnel during the first year of operation to calibrate and check system operation, and provide software upgrades for the following equipment:
   - Edstrom Pulse CMC™ System & Indigo RO

4. -1- Set of Operation and Maintenance Manuals (CD Version).

5. A basic system overview will be provided for the customer, at the time of system start-up, by an Edstrom Technician.

6. Required Submittal Drawings for approval.

7. -1- Set of As-built Drawings (upon request).

8. One day of owner on-site training is included with the new Pulse CMC™ and Indigo RO system purchase. Training to include all aspects of configuring and administrating the functions of the Pulse CMC™ and Indigo system. Training session is limited to and includes training materials for up to 10 individuals. Customer must contact Edstrom training department to schedule training within 3 months of the date of system start-up or owner acceptance.

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BUDGET DETAILS
(continued)

The following requirements must be provided/installed by others for installation to be completed:

1. **Pressure Reducing Station**
   - Provide and make final connection to the appropriate facility water supply (75 psi max) (5.2 bar max)

2. **Multi-Media Sediment Filter**
   - Provide a 120 VAC (230 VAC)electrical outlet
   - Provide and make final connection to floor drain within 15 feet (4580 mm) of the filter.

3. **Activated Carbon Filter**
   - Provide a 120 VAC (230 VAC) electrical outlet
   - Provide and make final connection to floor drain within 15 feet (4580 mm)of the filter

4. **Indigo RO Electrical Utilities** (NOTE: for North American customers)

   - RO Pump Motor and VFD
     Voltage: 208-230/460
     Full Load Amps: 8.4-7.6/3.8
     Frequency: 50/60Hz
     3 Phase
     If below 208-230 or 460 utility must be stepped up to 208-230 or 460 respectively.

   - Distribution Pump Motor
     1.5 HP Distribution Pump Motor at 60 Hz
     Voltage: 208-230/460
     Full Load Amps: 4.8-4.5/2.4
     3 Phase

   - Controller
     Voltage: 100-240
     Amperage: 4
     Frequency: 50/60Hz
     1 Phase

   - Chemical Injection Pump
     Voltage: 100-120
     Amperage: 1.5
     Frequency: 50/60Hz
     1 Phase

   - Consult Local Electrical Codes for Manual Disconnect Installation

5. **Indigo Web Server Requirements**
   - Provide one TCP/IP connection which includes 2 static IP addresses, IP subnet mask, IP gateway address, and DNS (domain name server). One static IP address for Touchscreen and one static IP address for the Indigo Smart Server. Compatible with Windows Internet Explorer 7, 8 or 9.

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6. **Customer Supplied Pulse CMC™ Computer or Virtual Environment Requirements**
If Pulse will be hosted on a customer's computer (desktop or laptop) or on a customer's virtualized system the customer is responsible for providing and maintaining the host environment.

- Dedicated computer or physical server used for the sole purpose of running Pulse120 GB hard drive space
- Microsoft® Windows® Win7 Pro/Enterprise/Ultimate SP1 [64-bit OS] or Windows Server 2008 or Windows Server 2012 R2 (64-bit)
- Adobe® Acrobat® Reader
- Microsoft Office 2010 (if reports are needed in Excel format)
- CPU: i7 processor (4 cores/8 threads running at 2.2 GHz, 6MB L3 Cache)
- CD-RW drive (DVD-RW drive recommended)
- Available USB 2.0 port
- Network Adapters: Provide one 100Base-T (1000Base-T recommended) adapters
- A non-public network TCP/IP connection located behind a firewall to the PC, which includes specifying a static IP address, IP subnet mask (customer network), IP gateway address, and DNS (domain name server)
  - Note: A second TCP/IP connection to the PC including network adapter is required if the PCC(X)(Y) is on a private network and not on the customer's network. In addition, to receive Email notifications, SMTP traffic must be routed from the private network to a SMTP server.
- Remote access software (customer provided) to allow service of System by Edstrom authorized personnel via VPN. Allow port 3389 (default) for RDP access to server.
- The following ports are utilized by the System to allow use of the web-based interface by end-users, and for PCC(X) and PSC communication to the PC or server:
  - Default: HTTP 8080
  - SNTP 123 (Time Synchronization for PCC)
  - TCP 22544 (PSC Secured Web Pages (if required))
  - UDP 22522 (PSC communication with wireless devices (if required))
  - UDP 22553 (PSC Non-secured Web Pages(if required)
- The following programs will be included with the Pulse installation:
  - Oracle® JAVA™ Runtime Environment
  - Oracle® GlassFish® Server (JAVA application server)
  - PostgreSQL™ (database application)
  - Pulse
  - Note: Use of software versions other than listed may cause conflicts on the PC
- The system will support the following Internet browser applications:
  - Microsoft Internet Explorer 11 Version: 11.09600 18282 Update Versions: 11.0.30 (KB3148198)
  - Google ChromeTM 50.0.266194 m
- The IP address and TCP port of a customer SMTP Server (required for Email options and Server notifications). If the customer requires secure SMTP, port 25 will need to be opened on the system to relay PCC email communications to the secure SMTP server.
- Recommended – User should have a dedicated emergency power circuit for PC or provide an uninterruptable power supply (UPS).
- Recommended - User should have a procedure to move backups out of the Pulse System and into a different storage media

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7. **Pulse CMC™ Central Controller X (PCCX) Panel**

- Provide 100 - 240 VAC, 50/60 Hz (130 Watts) and make final connection to recommended uninterruptible power supply (UPS), or provide dedicated emergency power circuit. If user does not provide UPS or dedicated emergency power circuit, a loss of data and/or a compromise of the environments that are controlled and monitored by Pulse may occur.
- Provide wire and make connection between UPS and controller (if applicable)
- Provide one dedicated analog telephone line which must conform to specifications outlined in: Bellcore TR-NPL-000275: Notes on the BOC Intra-LATA Networks, 1986. If remote (VPN) access to the Pulse System is not available, a second dedicated analog telephone line for the PCCX must be provided.
- A non-public network TCP/IP connection located behind a firewall to the PCCX Panel which includes specifying a static IP address
- The following ports are utilized by the System to allow PCCX communication to the PC or server:
  - Default: HTTP 80
  - HTTP 80 (Used for downloads and miscellaneous communication between the Pulse Web Application and the PCC user interface web page

Other Items Not Included:

1. Suspended hangers required for room distribution/header piping are not included.
2. Receiving, unloading and storing material at jobsite is not included.
3. Final disposal of packaging, scrap material, and removed equipment is not included.
5. Permits, certifications and inspections required by local, state or federal codes are not included.
6. Caulking, patching and painting of walls and ceilings is not included.
7. **Installation is not included.**
8. **Bonds are not included.**
9. Edstrom is not liable for maintenance and operation of system hardware and all other non-Edstrom supplied software. Validation or execution of any validation plan is not included. Any validation of execution of validation will be the customer's responsibility.
10. **Taxes are not included.**
11. Videotaping of training is not included.
12. Edstrom Industries, LLC does not provide seismic calculations, bracing, or restraints. If required these must be provided and installed by others.
13. Header piping between floors by others.

Template:F-000202, Rev D

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General and Commercial Terms:

1. Payment Terms are Net 30 Days after invoice to approved credit, no retainages will be allowed. Invoices will be issued at the time of shipment of material; partial shipment may be made and invoiced separately. Invoices for installation services will be limited to one per month. Invoices will be submitted on Edstrom Industries, LLC Standard forms. No cash discounts are allowed. Edstrom Industries, LLC reserves the right to revoke any credit extended to the customer for any reason throughout the course of the job. All payments must be made in U.S. dollars. If written orders are received by Edstrom Industries, LLC stating terms different than those stated herein, final acceptance of the order will be withheld until mutually acceptable terms are agreed upon.

2. The Terms stated within this document are intended as a complete and exclusive statement of any subsequent order/contract. None of the Terms may be added to modify or supersede unless agreed upon by both parties in writing.

3. Under no circumstances will we be responsible or liable for any action or claim including those arising out of injury or death, which results from an act or negligence of Buyer/Contractor or other hired sub-contractors on-site.

4. Edstrom Industries, LLC collects sales taxes in your state. These taxes are not included in the purchase and will be added to all invoices. If the buyer claims tax exemption, a proper exemption certificate must be received by Edstrom Industries, LLC prior to shipment of material or commencement of any installation on-site.

5. Unless otherwise agreed upon, all shipments are FOB Waterford Wisconsin or shipping point. Risk of loss will pass to the Buyer at the time of shipment. Title to the goods will remain with Edstrom Industries, LLC until payment is received from the Buyer. . For further explanation of INCOTERMS® 2010 please refer to http://www.iccwbo.org/products-and-services/trade-facilitation/incoterms-2010/the-incoterms-rules/ or https://www.i-b-t.net/incoterms.html

6. The non-discrimination clause contained in Section 202 of the Executive Order No. 11246 relative to equal employment opportunities for all persons without regard to race, religion, color, sex, age or national origin is incorporated into this agreement.

7. All new equipment from Edstrom Industries, LLC is warranted to be free from defects in materials and workmanship under normal use and service for a period of one year from the system start-up by Edstrom Industries, LLC. Animal drinking valves have a two-year warranty. If a defect in materials or workmanship appears during the one-year warranty period, your sole and exclusive remedy, and Edstrom Industries, LLC's sole liability under this warranty is the repair or replacement of such defective equipment, including necessary on-site labor. This warranty doesn't cover any parts that have been misused or damaged by others.
Edstrom Industries, LLC disclaims all warranties, express or implied, not stated in this paragraph, including without limitation, any warranty of title, merchantability or fitness for a particular purpose.

   In no event shall Edstrom Industries, LLC be liable to you or any third party for any indirect, special, incidental, or consequential damages (including loss of profits), even if Edstrom Industries, LLC has been advised of the possibility of such damages. Purchaser's remedy in the aggregate shall not exceed the purchase price of the equipment that gave rise to the claim.

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A return authorization must be obtained from Edstrom Industries, LLC before returning any goods, new or defective. Proof of purchase such as the original invoice number or purchase order number has to be provided. Merchandise can be returned for credit only if the product is the current model or design, is in original packaging and is subject to a minimum 15% restocking fee. Customer pays all shipping charges on returned goods. **Custom made merchandise cannot be returned**.

Canceled or changed orders are subject to administrative charges and material charges depending on what stage of manufacturing the product was when cancelled/changed.

8. Edstrom Industries, LLC will provide customers with background check and credit information on employees assigned to their account upon written request. Any background check information which is provided shall be maintained on a confidential, need to know basis and not disclosed to any other person or entity without prior written consent from Edstrom Industries, LLC

9. Edstrom Industries, LLC has the following insurance coverage. Additional insurance required by the buyer will be added to the invoice.
   a. **Comprehensive General Liability**: General Aggregate (other than products/completed operations) $2,000,000. Products/Completed Operation Aggregate $2,000,000. Bodily Injury and Property Damage Liability $1,000,000 each occurrence.
   b. **Automobile Liability**: $1,000,000.
   c. **Worker's Compensation Statutory**: Bodily Injury by Accident $100,000 Each. Bodily Injury by Disease $100,000 Each. Bodily Injury by Disease $500,000 Limit.
   d. **Umbrella Excess Liability**: $5,000,000 Limit of Liability.

   NOTE: Edstrom Industries, LLC carries sufficient insurance coverage with an annual policy and will not participate in any Owner/Contractor Consolidated Insurance Program. Edstrom Industries, LLC will provide proof of insurance upon request.

QUOTE VALID FOR 90 DAYS
/mh

Thomas Hodges

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SCHEDULE DETAILS

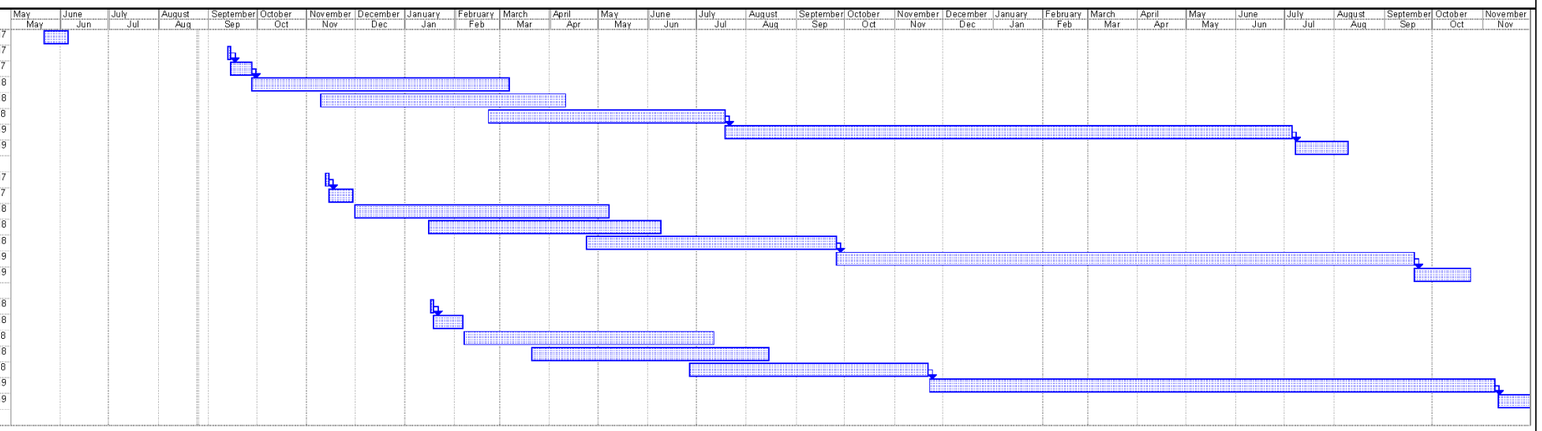
SCHEDULE DETAILS

UNIVERSITY OF SOUTHERN CALIFORNIA
HMR VIVARIUM RENOVATION

PRELIMINARY PROJECT SCHEDULE
DRAFT #7

HAMILTON CONSTRUCTION
August 25, 2017

ID	Task Name	Resource Names	Duration	Start	Finish
1	CONCLUDE FEASIBILITY STUDY		10 days	Mon 5/22/17	Mon 6/5/17
2	CAMPUS PLANNING - APPROVAL - SCENARIO A		2 days	Wed 9/13/17	Thu 9/14/17
3	FINANCE COMMITTEE REVIEW AND APPROVAL - SCENARIO A		9 days	Fri 9/15/17	Wed 9/27/17
4	DESIGN		110 days	Thu 9/28/17	Tue 3/6/18
5	GC SELECTION, BID & AWARD		104 days	Fri 11/10/17	Tue 4/10/18
6	PLAN CHECK & PERMITS		104 days	Thu 2/22/18	Wed 7/18/18
7	CONSTRUCTION		248 days	Thu 7/19/18	Fri 7/5/19
8	MOVE-IN		25 days	Mon 7/8/19	Fri 8/9/19
9					
10	CAMPUS PLANNING - APPROVAL - SCENARIO B		2 days	Mon 11/13/17	Tue 11/14/17
11	FINANCE COMMITTEE REVIEW AND APPROVAL - SCENARIO B		9 days	Wed 11/15/17	Wed 11/29/17
12	DESIGN		110 days	Fri 12/1/17	Mon 5/7/18
13	GC SELECTION, BID & AWARD		104 days	Tue 1/16/18	Fri 6/8/18
14	PLAN CHECK & PERMITS		109 days	Tue 4/24/18	Tue 9/25/18
15	CONSTRUCTION		253 days	Wed 9/26/18	Thu 9/19/19
16	MOVE-IN		25 days	Fri 9/20/19	Thu 10/24/19
17					
18	CAMPUS PLANNING - APPROVAL - SCENARIO C		2 days	Wed 1/17/18	Thu 1/18/18
19	FINANCE COMMITTEE REVIEW AND APPROVAL - SCENARIO C		12 days	Fri 1/19/18	Mon 2/5/18
20	DESIGN		110 days	Wed 2/7/18	Wed 7/11/18
21	GC SELECTION, BID & AWARD		104 days	Wed 3/21/18	Tue 8/14/18
22	PLAN CHECK & PERMITS		104 days	Wed 6/27/18	Wed 11/21/18
23	CONSTRUCTION		248 days	Fri 11/23/18	Fri 11/8/19
24	MOVE-IN		30 days	Mon 11/11/19	Mon 12/23/19
25					



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SCHEDULE DETAILS

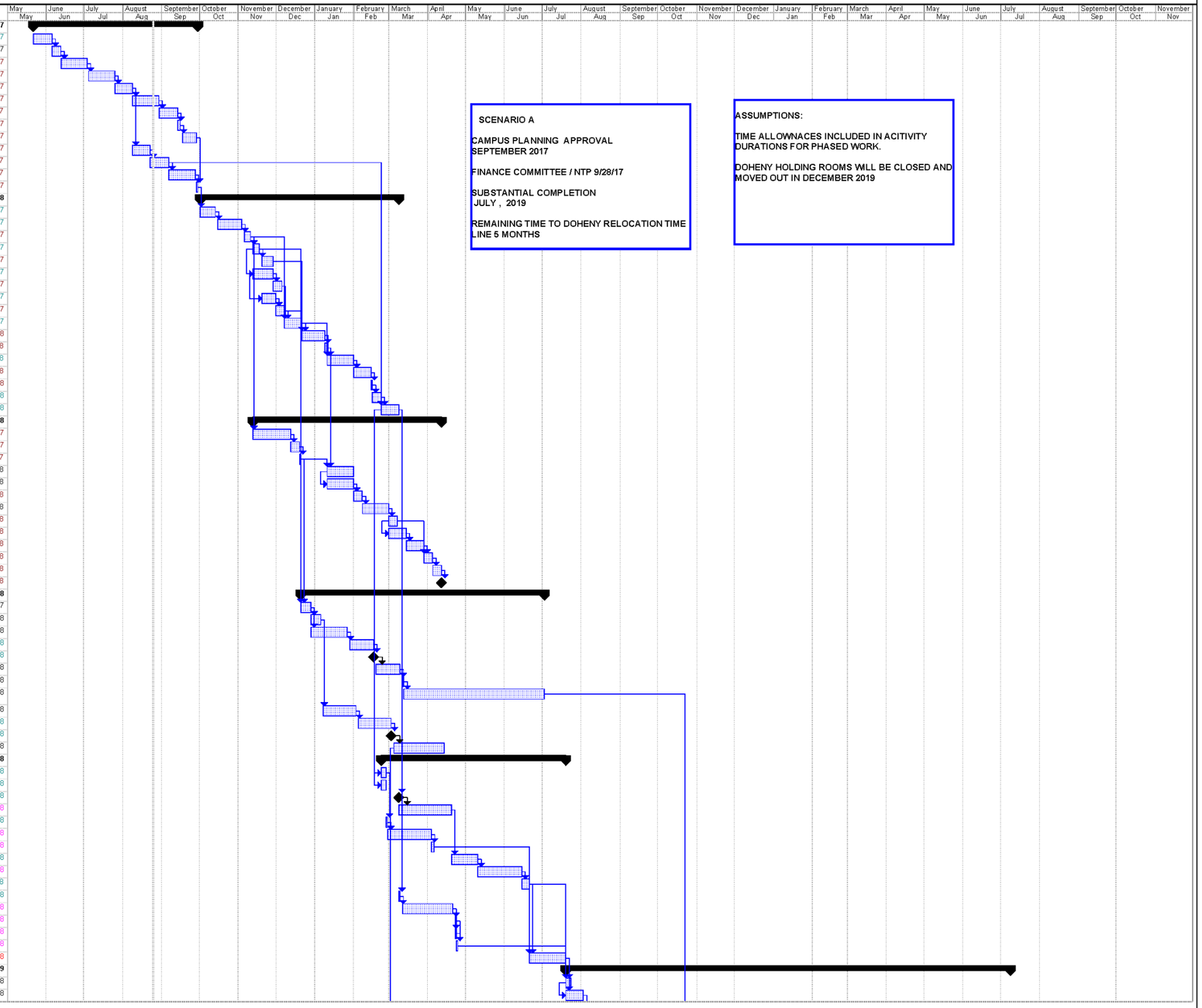
(continued)

UNIVERSITY OF SOUTHERN CALIFORNIA
HMR VIVARIUM RENOVATION

PRELIMINARY PROJECT SCHEDULE
DRAFT #7

HAMILTON CONSTRUCTION
August 25, 2017

ID	Task Name	Resource Names	Duration	Start	Finish
26	**CONCLUDE FEASIBILITY STUDY - A&E SELECTION**	**CCD**	**92 days**	**Mon 5/22/17**	**Fri 9/29/17**
27	FEASIBILITY STUDY	DFS	10 days	Mon 5/22/17	Mon 6/5/17
28	PREPARE COST & PRELIMINARY SCHEDULE	HC	5 days	Tue 6/6/17	Mon 6/12/17
29	PREPARE MOU	CCD	15 days	Tue 6/13/17	Mon 7/3/17
30	CCD / USC REVIEW OF COST, SCHEDULE, MOU	CCD	15 days	Wed 7/5/17	Tue 7/25/17
31	PREPARE DOC FOR BOARD REVIEW	CCD	10 days	Wed 7/26/17	Tue 8/8/17
32	BOARD SUBMITTAL	CCD	15 days	Wed 8/9/17	Tue 8/29/17
33	WAITING PERIOD - BOARD OF TRUSTEE MEETING	CCD	10 days	Wed 8/30/17	Wed 9/13/17
34	CAMPUS PLANNING - APPROVAL	BOARD	2 days	Thu 9/14/17	Fri 9/15/17
35	FINANCE COMMITTEE REVIEW AND APPROVAL	FINANCE	9 days	Mon 9/18/17	Thu 9/28/17
36	PREPARE RFP PACKAGE FOR A&E	CCD	10 days	Wed 8/9/17	Tue 8/22/17
37	DISTRIBUTE RFP FOR A&E - RFP PERIOD	CCD	10 days	Wed 8/23/17	Wed 9/6/17
38	A & E INTERVIEW - SELECT THE DESIGN TEAM	CCD	15 days	Thu 9/7/17	Wed 9/27/17
39	NTP DESIGN	CCD	1 day	Fri 9/29/17	Fri 9/29/17
40	**DESIGN - SCENARIO A**	**CRB**	**110 days**	**Mon 10/2/17**	**Thu 3/8/18**
41	PROGRAM REVIEW / VALIDATION	A&E	10 days	Mon 10/2/17	Fri 10/13/17
42	SCHEMATIC DESIGN	A&E	15 days	Mon 10/16/17	Fri 11/3/17
43	REVIEW / APPROVE SCHEMATIC DESIGN	DAR / CCD	5 days	Mon 11/6/17	Fri 11/10/17
44	CONFIGURE TUNNEL WASH STERILIZER LAYOUT	A&E	5 days	Mon 11/13/17	Fri 11/17/17
45	REVIEW & APPROVE TUNNEL WASH / STERILIZER	VSOE	5 days	Mon 11/20/17	Tue 11/28/17
46	CONFIGURE HOLDING / PROCEDURE ROOMS LAY OUT	A&E	10 days	Mon 11/13/17	Tue 11/28/17
47	REVIEW / APPROVE HOLDING / PROCEDURE ROOMS LAY OUT	DAR / CCD	5 days	Wed 11/29/17	Tue 12/5/17
48	CONFIGURE ANIMAL WATERING SYSTEM LAYOUT	A&E	7 days	Mon 11/20/17	Thu 11/30/17
49	REVIEW / APPROVE ANIMAL WATERING SYSTEM LAYOUT	DAR / CCD	5 days	Fri 12/1/17	Thu 12/7/17
50	PREPARE 50% CONSTRUCTION DOC. (CD)	A&E	10 days	Fri 12/8/17	Thu 12/21/17
51	REVIEW 50% CD	FMSI/CCD / DAR	10 days	Fri 12/22/17	Mon 1/8/18
52	SUBMIT COMMENTS ON 50% CD	FMSI/CCD / DAR	2 days	Tue 1/9/18	Wed 1/10/18
53	PREPARE 90% CONSTRUCTION DOC.	A&E	15 days	Thu 1/11/18	Wed 1/31/18
54	REVIEW 90% CD	FMSI/CCD / DAR	10 days	Thu 2/1/18	Wed 2/14/18
55	SUBMIT 90% REVIEW COMMENTS	FMSI/CCD / DAR	1 day	Thu 2/15/18	Thu 2/15/18
56	INCORPORATE USC/FMS COMMETS IN 90% CD	A&E	5 days	Fri 2/16/18	Thu 2/22/18
57	PREPARE 100% CONSTRUCTION DOC	A&E	10 days	Fri 2/23/18	Thu 3/8/18
58	**GC SELECTION - GMP PROCESS - SCENARIO A**		**104 days**	**Mon 11/13/17**	**Wed 4/11/18**
59	PREPARE / DISTRIBUTE RFP FOR GC (PRECON)	CCD	20 days	Mon 11/13/17	Tue 12/12/17
60	INTERVIEW / SELECT GC	CCD	5 days	Wed 12/13/17	Tue 12/19/17
61	NTP TO GC	CCD	1 day	Wed 12/20/17	Wed 12/20/17
62	PREPARE COST ESTIMATE FOR 50% CD	GC	15 days	Thu 1/11/18	Wed 1/31/18
63	PREPARE CONSDTRUCTIBILITY REPORT FOR 50% CD	GC	15 days	Thu 1/11/18	Wed 1/31/18
64	REVIEW 50% CD COST ESTIMATE	CCD	5 days	Thu 2/1/18	Wed 2/7/18
65	PREPARE COST ESTIMATE FOR 90% CD	GC	15 days	Thu 2/8/18	Wed 2/28/18
66	REVIEW 90% CD COST ESTIMATE	TEAM	5 days	Thu 3/1/18	Wed 3/7/18
67	PREPARE MOU FOR CONSTRUCTION	CCD	10 days	Thu 3/1/18	Wed 3/14/18
68	MOU REVIEW AND APPROVAL	CCD / USC	10 days	Thu 3/15/18	Wed 3/28/18
69	NEGOTIATE - FINALIZE GMP	CCD	5 days	Thu 3/29/18	Wed 4/4/18
70	PREPARE GC CONTRACT AMENDMENT	CCD	5 days	Thu 4/5/18	Wed 4/11/18
71	NTP GC - FOR CONSTRUCTION	CCD	0 days	Wed 4/11/18	Wed 4/11/18
72	**SUBCONTRACT BID / AWARD - SUBMITTAL PROCESS**		**136 days**	**Thu 12/21/17**	**Mon 7/2/18**
73	NOTICE PROCEED - MAJOR EQUIPMENT	GC	5 days	Thu 12/21/17	Thu 12/28/17
74	NOTICE TO PROCEED TRADE SUBCONTRACTORS	GC	5 days	Fri 12/29/17	Fri 1/5/18
75	PREPARE MAJOR EQUIPMENT SHOP DRAWINGS	TBD	20 days	Fri 12/29/17	Fri 1/26/18
76	REVIEW MAJOR EQUIPMENT SHOP DRAWINGS	CRB	15 days	Mon 1/29/18	Fri 2/16/18
77	APPROVE MAJOR EQUIPMENT SUBMITTALS	CRB	0 days	Fri 2/16/18	Fri 2/16/18
78	INCORPORATE APPROVAL COMENTS IN MAJOR EQUIP.	TBD	15 days	Mon 2/19/18	Fri 3/9/18
79	RELEASE MAJOR EQUIPMENT FABRICATION	TBD	1 day	Mon 3/12/18	Mon 3/12/18
80	LEAD TIME MAJOR EQUIPMENT I.E. TUNNEL WASH, STERILIZER, ANIMAL WATERING SYSTEM	TBD	80 days	Tue 3/13/18	Mon 7/2/18
81	PREPARE REMAINING SUBMITTALS	TBD	20 days	Mon 1/8/18	Fri 2/2/18
82	REVIEW REMAINING SUBMITTALS	A&E	20 days	Mon 2/5/18	Fri 3/2/18
83	APPROVE REMAINING SUBMITTALS	A&E	0 days	Fri 3/2/18	Fri 3/2/18
84	MATERIAL ORDERING FABRICATION LEAD TIME	TBD	30 days	Mon 3/5/18	Fri 4/13/18
85	**BUILDING DEPARTMENT PLAN CHECK PROCESS**	**LADBS**	**104 days**	**Fri 2/23/18**	**Thu 7/19/18**
86	OPEN CASE MANAGEMENT WITH BUILDING DEPT	HC/A&E	2 days	Fri 2/23/18	Mon 2/26/18
87	VERIFY PLAN CHECK PERIOD WITH BLDG DEPT	HC/A&E	2 days	Fri 2/23/18	Mon 2/26/18
88	SUBMIT PLAN CHECK - ARCHITECTURAL PACKAGE	A&E	0 days	Thu 3/8/18	Thu 3/8/18
89	PLAN CHECK PERIOD	LADBS	30 days	Fri 3/9/18	Thu 4/19/18
90	SUBMIT FIRE DEPARTMENT PACKAGE	A&E	1 day	Tue 2/27/18	Tue 2/27/18
91	FIRE DEPARTMENT PLAN CHECK PERIOD	LADBS	25 days	Wed 2/28/18	Tue 4/3/18
92	FIRE DEPARTMENT APPROVAL	LADBS	2 days	Wed 4/4/18	Thu 4/5/18
93	INCORPORATE PLAN CHECK COMMENTS	A&E	15 days	Fri 4/20/18	Thu 5/10/18
94	PLAN CHECK - 2ND REVIEW	LADBS	25 days	Fri 5/11/18	Thu 6/14/18
95	RTI ARCHITECTURAL ON HOLD PENDING M,P,E	A&E	4 days	Fri 6/15/18	Wed 6/20/18
96	SUBMIT PLAN CHECK PACKAGE M,P,E,	A&E	1 day	Fri 3/9/18	Fri 3/9/18
97	PLAN CHECK PERIOD - M, P, E	LADBS	30 days	Mon 3/12/18	Fri 4/20/18
98	MECHANICAL PLAN APPROVAL	LADBS	1 day	Mon 4/23/18	Mon 4/23/18
99	PLUMBING, ELECTRICAL APPROVAL	LADBS	1 day	Mon 4/23/18	Mon 4/23/18
100	M,P,E PACKAGE RTI	LADBS	1 day	Tue 4/24/18	Tue 4/24/18
101	FINAL BACKCHECK/SECURE BUILDING PERMIT	HC/CCD	20 days	Thu 6/21/18	Thu 7/19/18
102	**CONSTRUCTION - SCENARIO A**	**HC**	**248 days**	**Fri 7/20/18**	**Mon 7/8/19**
103	CONSTRUCTION IMPACT COORDINATION (OTHER TENENTS)	HC/HMR	2 days	Fri 7/20/18	Mon 7/23/18
104	MOBILIZATION	HC	10 days	Fri 7/20/18	Thu 8/2/18



SCENARIO A

CAMPUS PLANNING APPROVAL
SEPTEMBER 2017

FINANCE COMMITTEE / NTP 9/28/17

SUBSTANTIAL COMPLETION
JULY , 2019

REMAINING TIME TO DOHENY RELOCATION TIME LINE 5 MONTHS

ASSUMPTIONS:

TIME ALLOWNACES INCLUDED IN ACITIVITY DURATIONS FOR PHASED WORK.

DOHENY HOLDING ROOMS WILL BE CLOSED AND MOVED OUT IN DECEMBER 2019

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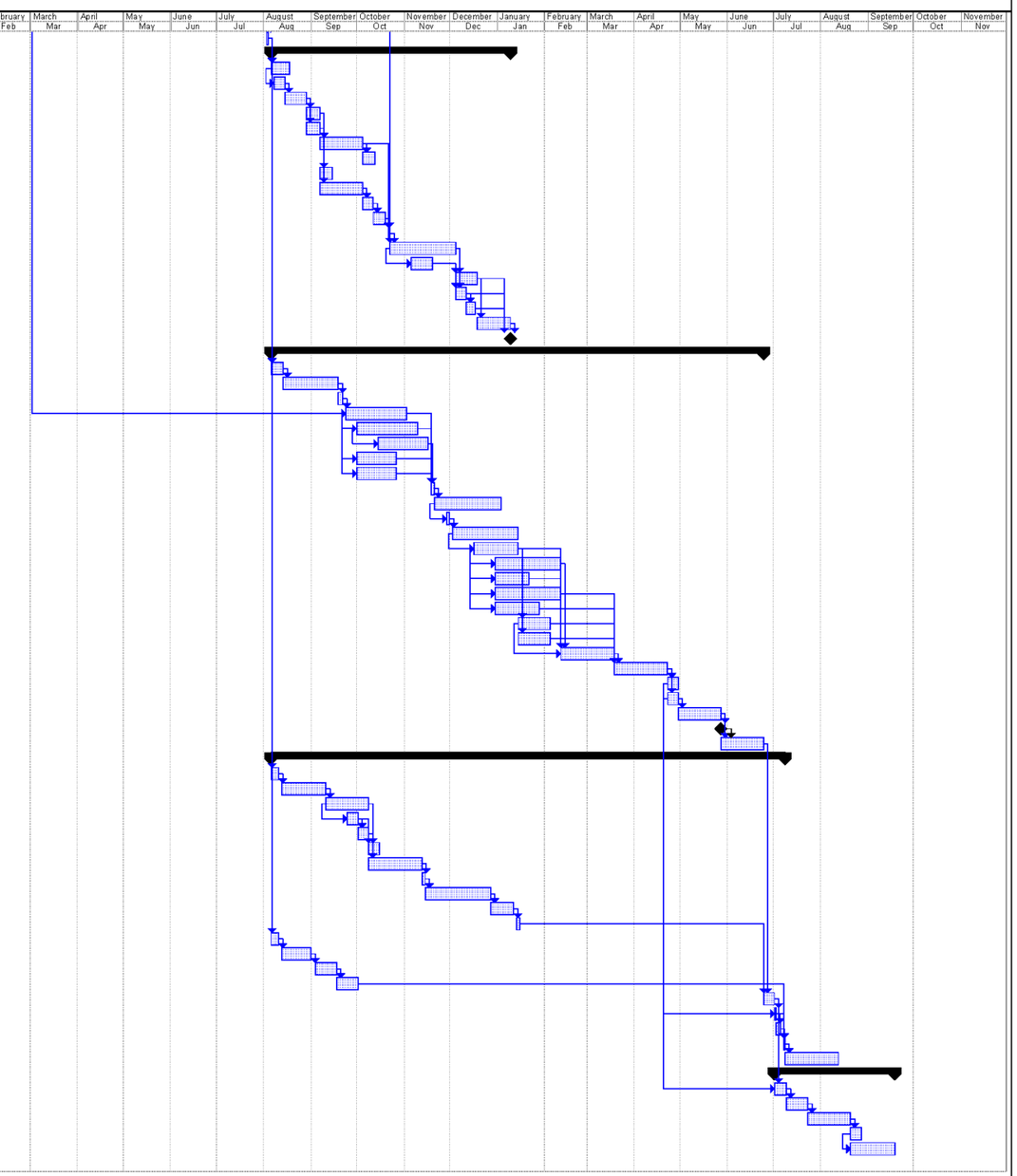
SCHEDULE DETAILS
(continued)

UNIVERSITY OF SOUTHERN CALIFORNIA
HMR VIVARIUM RENOVATION

PRELIMINARY PROJECT SCHEDULE
DRAFT #7

HAMILTON CONSTRUCTION
August 25, 2017

ID	Task Name	Resource Names	Duration	Start	Finish
105	SUBCONTRACTORS COORDINATION	HC	1 day	Fri 8/3/18	Fri 8/3/18
106	**BASEMENT**		**110 days**	**Mon 8/6/18**	**Wed 1/9/19**
107	REWORK EXISTING PLUMBING AT CAGE WASH AREA	TBD	10 days	Mon 8/6/18	Fri 8/17/18
108	RELOACTE STEAM GENERATOR	TBD	5 days	Wed 8/8/18	Tue 8/14/18
109	SLECTIVE DEMO	TBD	10 days	Wed 8/15/18	Tue 8/28/18
110	MODIFICATION TO EXISTING WALLS	TBD	6 days	Wed 8/29/18	Thu 9/6/18
111	COVER TRENCH DRAIN AT NEW DOORWAY	TBD	6 days	Wed 8/29/18	Thu 9/6/18
112	NEW MPE INFRASTRUCTURE FOR TUNNEL WASH & STERILIZER	TBD	20 days	Fri 9/7/18	Thu 10/4/18
113	INSTALL NEW SHIELDING AT DRYHEAT STERILIZER	TBD	6 days	Fri 10/5/18	Fri 10/12/18
114	INSTALL NEW AUTOMATIC SLIDING DOOR	TBD	6 days	Fri 9/7/18	Fri 9/14/18
115	INSTALL NEW STAINLESS STEEL EXHAUST DUCT	TBD	20 days	Fri 9/7/18	Thu 10/4/18
116	INSTALL NEW ST. ST. CANOPY FOR NEW STERILIZER	TBD	5 days	Fri 10/5/18	Thu 10/11/18
117	REFINISH EPOXY FLOORING	TBD	6 days	Fri 10/12/18	Fri 10/19/18
118	ROUGH-IN INSPECTION	LADBS	1 day	Mon 10/22/18	Mon 10/22/18
119	INSTALL NEW TUNNEL WASHER	TBD	30 days	Tue 10/23/18	Tue 12/4/18
120	INSATALL NEW STERILIZER	TBD	10 days	Tue 11/6/18	Mon 11/19/18
121	MPE CONENCTION AT NEW EQUIPMENT	TBD	10 days	Wed 12/5/18	Tue 12/18/18
122	NEW ST. ST. CALDDING AT WALLS	TBD	5 days	Wed 12/5/18	Tue 12/11/18
123	NEW DOOR & HARDWARE	TBD	4 days	Wed 12/12/18	Mon 12/17/18
124	EQUIPMENT START-UP , TESTING CALIBORATION	TBD	15 days	Wed 12/19/18	Wed 1/9/19
125	READY FOR PUNCH LIST	TBD	0 days	Wed 1/9/19	Wed 1/9/19
126	**HOLDING / PROCEDURE ROOMS - FLOOR 2 - 9**		**228 days**	**Mon 8/6/18**	**Mon 6/24/19**
127	CONSTRUCT DUST PARTITIONS - IMPLIMENT PROTECIVE MEASU	TBD	6 days	Mon 8/6/18	Mon 8/13/18
128	INTERIOR DEMOLITION	TBD	25 days	Tue 8/14/18	Tue 9/18/18
129	LAY-OUTS	TBD	3 days	Wed 9/19/18	Fri 9/21/18
130	INSTALL INTERIOR WALL FRAMING	TBD	30 days	Mon 9/24/18	Fri 11/2/18
131	HVAC ROGH-IN DUCT WORK / MIXING BOXES	TBD	30 days	Mon 10/1/18	Fri 11/9/18
132	INSTALL INTERIOR CEILING FRAMING	TBD	25 days	Mon 10/15/18	Fri 11/16/18
133	ROGH-IN IN WALL ELECTRICAL	TBD	20 days	Mon 10/1/18	Fri 10/26/18
134	ROUGH-IN INWALL PLMBING	TBD	20 days	Mon 10/1/18	Fri 10/26/18
135	ROUGH- IN INSPECTIONS	LADBS	2 days	Mon 11/19/18	Tue 11/20/18
136	INSTALL SHEATING / REINFORCING MESH	TBD	30 days	Wed 11/21/18	Thu 1/3/19
137	DRYWALL SCREW INSPECTION	LADBS	2 days	Thu 11/29/18	Fri 11/30/18
138	INSTALL PRIMER & FINISH	TBD	30 days	Mon 12/3/18	Mon 1/14/19
139	APPLY EPOXY PAINT WALLS / CEILING	TBD	20 days	Mon 12/17/18	Mon 1/14/19
140	INSTALL OVERHEAD PIPING FOR WATERING SYSTEM	TBD	30 days	Mon 12/31/18	Mon 2/11/19
141	INSATLL LIGHT LIGHT FIXTURES	TBD	15 days	Mon 12/31/18	Mon 1/21/19
142	INSTALL HORIZONTAL DUCT DISTRIBUTION	TBD	30 days	Mon 12/31/18	Mon 2/11/19
143	INSTALL PLUMBING FIXTURES	TBD	20 days	Mon 12/31/18	Mon 1/28/19
144	INSTALL DOOR & HARDWARE	TBD	15 days	Tue 1/15/19	Mon 2/4/19
145	INSATALL ELECTRICAL DEVICES	TBD	15 days	Tue 1/15/19	Mon 2/4/19
146	INSATLL EPOXY FLOORING	TBD	25 days	Tue 2/12/19	Mon 3/18/19
147	EQUIPMENT START UP / TEST & BALANCE	TBD	25 days	Tue 3/19/19	Mon 4/22/19
148	FINAL INSPECTIONS	LADBS	5 days	Tue 4/23/19	Mon 4/29/19
149	PREPARE INTERIOR PUNCH LIST	TBD	5 days	Tue 4/23/19	Mon 4/29/19
150	COMPLETE INTERIOR PUNCH LIST	TBD	20 days	Tue 4/30/19	Mon 5/27/19
151	READY FOR OFCI	TBD	0 days	Mon 5/27/19	Mon 5/27/19
152	INSTALL OFCI	TBD	20 days	Tue 5/28/19	Mon 6/24/19
153	**EXTERIOR WORK**		**237 days**	**Mon 8/6/18**	**Mon 7/8/19**
154	INSATLL SCAFFOLDING	TBD	5 days	Mon 8/6/18	Fri 8/10/18
155	INSATLL STRUCTURAL FRAMING FOR DUCT SHAFT	TBD	20 days	Mon 8/13/18	Mon 9/10/18
156	INSATLL NEW EXHAUST DUCT	TBD	20 days	Tue 9/11/18	Mon 10/8/18
157	INSATLL NEW EXHAUST FAN	TBD	5 days	Tue 9/25/18	Mon 10/1/18
158	ELCTRICAL CONNECTION AT EXHASUT FAN	TBD	5 days	Tue 10/2/18	Mon 10/8/18
159	START-UP / TEST & BALANCE	TBD	5 days	Tue 10/9/18	Mon 10/15/18
160	INSATLL FRAMING AT EXHAUST SHAFT	TBD	25 days	Tue 10/9/18	Mon 11/12/18
161	FRAMING INSPECTION	TBD	2 days	Tue 11/13/18	Wed 11/14/18
162	LATH AND PLASTER	TBD	30 days	Thu 11/15/18	Thu 12/27/18
163	EXTERIOR PAINTING	TBD	10 days	Fri 12/28/18	Fri 1/11/19
164	REMOVE SCAFFOLDING	TBD	2 days	Mon 1/14/19	Tue 1/15/19
165	INSTALL CONCRETE PAD FOR EMERGENCY GENERATOR	TBD	5 days	Mon 8/6/18	Fri 8/10/18
166	INSTALL NEW EMERGENCY GENERATOR	TBD	15 days	Mon 8/13/18	Fri 8/31/18
167	INSTALL NEW ATS AND DISTRIUTIOPN BOARD	TBD	10 days	Tue 9/4/18	Mon 9/17/18
168	EMERGENCY GENERATOR TESTING	TBD	10 days	Tue 9/18/18	Mon 10/1/18
169	FINAL CLEAN-UP	TBD	5 days	Tue 6/25/19	Mon 7/1/19
170	FIRE DEPARTMENT INSPECTION	LADBS	1 day	Tue 7/2/19	Tue 7/2/19
171	PLUMBING, MECHANICAL, ELECTRICAL INSPECTIONS	LADBS	2 days	Wed 7/3/19	Fri 7/5/19
172	FINAL INSPECTION	LADBS	1 day	Mon 7/8/19	Mon 7/8/19
173	MOVE-IN	DAR	25 days	Tue 7/9/19	Mon 8/12/19
174	**PUNCH LIST / CLOSE OUTS - SCENARIO A**		**55 days**	**Tue 7/2/19**	**Wed 9/18/19**
175	PREPARE PUNCH LIST	A&E	5 days	Tue 7/2/19	Tue 7/9/19
176	DISTRIBUTE / ADMISTRE PUNCH LIST	TBD	10 days	Wed 7/10/19	Tue 7/23/19
177	COMPLETE PUNCH LIST ITEMS	TBD	20 days	Wed 7/24/19	Tue 8/20/19
178	SUBMIT AS-BUILTS O&M	TBD	5 days	Wed 8/21/19	Tue 8/27/19
179	CLOSE OUT CONTRACT	TBD	20 days	Wed 8/21/19	Wed 9/18/19
180					



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SCHEDULE DETAILS
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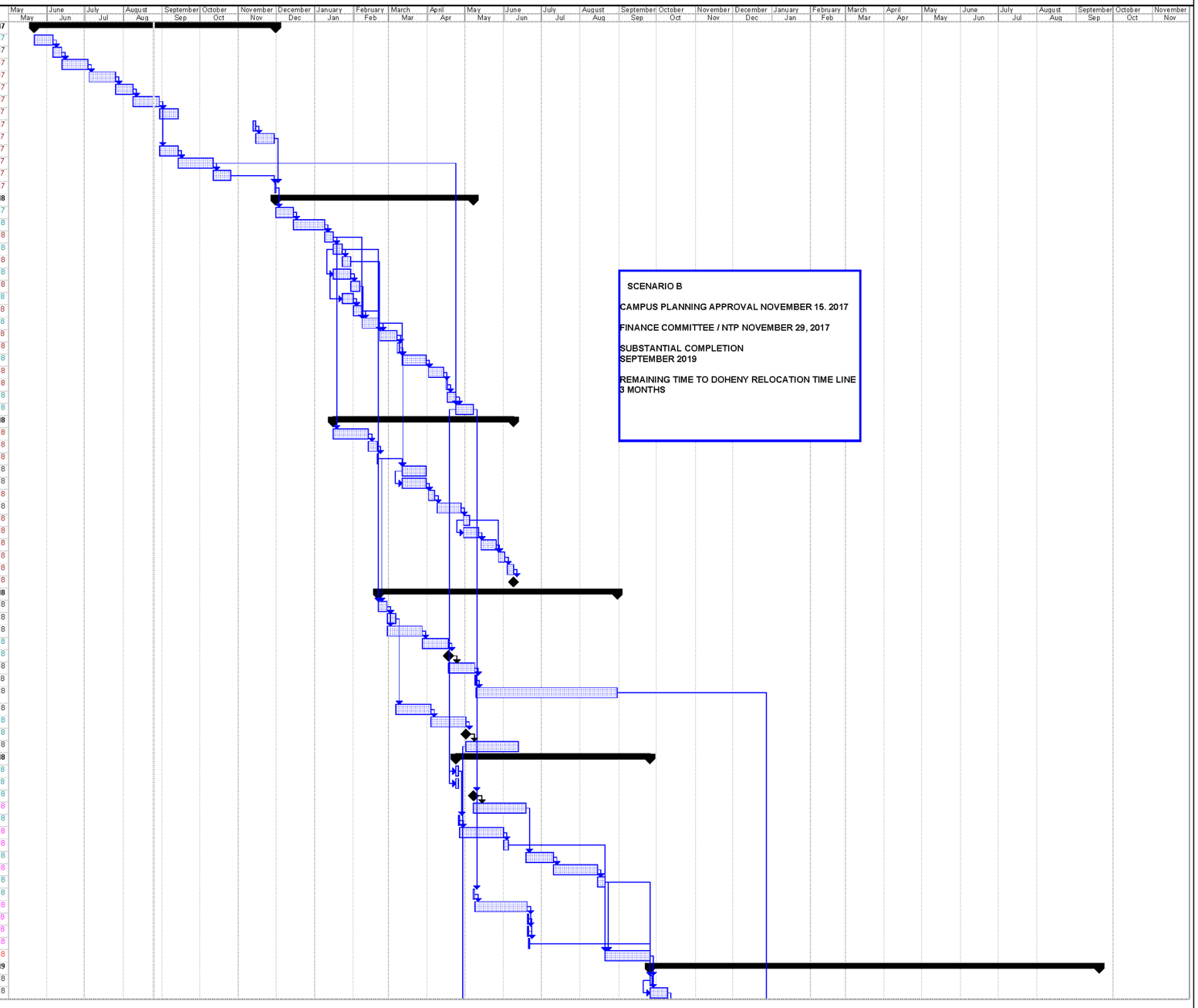
UNIVERSITY OF SOUTHERN CALIFORNIA
HMR VIVARIUM RENOVATION

PRELIMINARY PROJECT SCHEDULE
DRAFT #7

HAMILTON CONSTRUCTION
August 25, 2017

ID	Task Name	Resource Names	Duration	Start	Finish
181	**CONCLUDE FEASIBILITY STUDY - A&E SELECTION - SCENARIO B**	**CCD**	**134 days**	**Mon 5/22/17**	**Thu 11/30/17**
182	FEASIBILITY STUDY	DFS	10 days	Mon 5/22/17	Mon 6/5/17
183	PREPARE COST & PRELIMINARY SCHEDULE	HC	5 days	Tue 6/6/17	Mon 6/12/17
184	PREPARE MOU	CCD	15 days	Tue 6/13/17	Mon 7/3/17
185	CCD / USC REVIEW OF COST, SCHEDULE, MOU	CCD	15 days	Wed 7/5/17	Tue 7/25/17
186	PREPARE DOC FOR BOARD REVIEW	CCD	10 days	Wed 7/26/17	Tue 8/8/17
187	BOARD SUBMITTAL	CCD	15 days	Wed 8/9/17	Tue 8/29/17
188	WAITING PERIOD - BOARD OF TRUSTEE MEETING	CCD	10 days	Wed 8/30/17	Wed 9/13/17
189	CAMPUS PLANNING MEETING - APPROVAL	BOARD	2 days	Mon 11/13/17	Tue 11/14/17
190	FINANCE COMMITTEE REVIEW AND APPROVAL	FINANCE	9 days	Wed 11/15/17	Wed 11/29/17
191	PREPARE RFP PACKAGE FOR A&E	CCD	10 days	Wed 8/30/17	Wed 9/13/17
192	DISTRIBUTE RFP FOR A&E - RFP PERIOD	CCD	20 days	Thu 9/14/17	Wed 10/11/17
193	A & E INTERVIEW - SELECT THE DESIGN TEAM	CCD	10 days	Thu 10/12/17	Wed 10/25/17
194	NTP DESIGN	CCD	1 day	Thu 11/30/17	Thu 11/30/17
195	**DESIGN - SCENARIO B**	**CRB**	**110 days**	**Fri 12/1/17**	**Mon 5/7/18**
196	PROGRAM REVIEW / VALIDATION	A&E	10 days	Fri 12/1/17	Thu 12/14/17
197	SCHEMATIC DESIGN	A&E	15 days	Fri 12/15/17	Mon 1/8/18
198	REVIEW / APPROVE SCHEMATIC DESIGN	DAR / CCD	5 days	Tue 1/9/18	Mon 1/15/18
199	CONFIGURE TUNNEL WASH STERILIZER LAYOUT	A&E	5 days	Tue 1/16/18	Mon 1/22/18
200	REVIEW & APPROVE TUNNEL WASH / STERILIZER	VSOE	5 days	Tue 1/23/18	Mon 1/29/18
201	CONFIGURE HOLDING / PROCEDURE ROOMS LAY OUT	A&E	10 days	Tue 1/16/18	Mon 1/29/18
202	REVIEW / APPROVE HOLDING / PROCEDURE ROOMS LAY OUT	DAR / CCD	5 days	Tue 1/30/18	Mon 2/5/18
203	CONFIGURE ANIMAL WATERING SYSTEM LAYOUT	A&E	7 days	Tue 1/23/18	Wed 1/31/18
204	REVIEW / APPROVE ANIMAL WATERING SYSTEM LAYOUT	DAR / CCD	5 days	Thu 2/1/18	Wed 2/7/18
205	PREPARE 50% CONSTRUCTION DOC. (CD)	A&E	10 days	Thu 2/8/18	Wed 2/21/18
206	REVIEW 50% CD	FMS/CCD / DAR	10 days	Thu 2/22/18	Wed 3/7/18
207	SUBMIT COMMENTS ON 50% CD	FMS/CCD / DAR	2 days	Thu 3/8/18	Fri 3/9/18
208	PREPARE 90% CONSTRUCTION DOC.	A&E	15 days	Mon 3/12/18	Fri 3/30/18
209	REVIEW 90% CD	FMS/CCD / DAR	10 days	Mon 4/2/18	Fri 4/13/18
210	SUBMIT 90% REVIEW COMMENTS	FMS/CCD / DAR	1 day	Mon 4/16/18	Mon 4/16/18
211	INCORPORATE USC/FMS COMMETS IN 90% CD	A&E	5 days	Tue 4/17/18	Mon 4/23/18
212	PREPARE 100% CONSTRUCTION DOC	A&E	10 days	Tue 4/24/18	Mon 5/7/18
213	**GC SELECTION - GMP PROCESS - SCENARIO B**		**104 days**	**Tue 1/16/18**	**Fri 6/8/18**
214	PREPARE / DISTRIBUTE RFP FOR GC (PRECON)	HC	20 days	Tue 1/16/18	Mon 2/12/18
215	INTERVIEW / SELECT GC	CCD	5 days	Tue 2/13/18	Mon 2/19/18
216	NTP TO GC	CCD	1 day	Tue 2/20/18	Tue 2/20/18
217	PREPARE COST ESTIMATE FOR 50% CD	GC	15 days	Mon 3/12/18	Fri 3/30/18
218	PREPARE CONSDTRUCTIBILITY REPORT FOR 50% CD	GC	15 days	Mon 3/12/18	Fri 3/30/18
219	REVIEW 50% CD COST ESTIMATE	CCD	5 days	Mon 4/2/18	Fri 4/6/18
220	PREPARE COST ESTIMATE FOR 90% CD	GC	15 days	Mon 4/9/18	Fri 4/27/18
221	REVIEW 90% CD COST ESTIMATE	TEAM	5 days	Mon 4/30/18	Fri 5/4/18
222	PREPARE MOU FOR CONSTRUCTION	CCD	10 days	Mon 4/30/18	Fri 5/11/18
223	MOU REVIEW AND APPROVAL	CCD / USC	10 days	Mon 5/14/18	Fri 5/25/18
224	NEGOTIATE - FINALIZE GMP	CCD	5 days	Mon 5/28/18	Fri 6/1/18
225	PREPARE GC CONTRACT AMENDMENT	CCD	5 days	Mon 6/4/18	Fri 6/8/18
226	NTP GC - FOR CONSTRUCTION	CCD	0 days	Fri 6/8/18	Fri 6/8/18
227	**SUBCONTRACT BID / AWARD - SUBMITTAL PROCESS**		**136 days**	**Wed 2/21/18**	**Thu 8/30/18**
228	NOTICE PROCEED - MAJOR EQUIPMENT	GC	5 days	Wed 2/21/18	Tue 2/27/18
229	NOTICE TO PROCEED TRADE SUBCONTRACTORS	GC	5 days	Wed 2/28/18	Tue 3/6/18
230	PREPARE MAJOR EQUIPMENT SHOP DRAWINGS	TBD	20 days	Wed 2/28/18	Tue 3/27/18
231	REVIEW MAJOR EQUIPMENT SHOP DRAWINGS	CRB	15 days	Wed 3/28/18	Tue 4/17/18
232	APPROVE MAJOR EQUIPMENT SUBMITTALS	CRB	0 days	Tue 4/17/18	Tue 4/17/18
233	INCORPORATE APPROVAL COMENTS IN MAJOR EQUIP.	TBD	15 days	Wed 4/18/18	Tue 5/8/18
234	RELEASE MAJOR EQUIPMENT FABRICATION	TBD	1 day	Wed 5/9/18	Wed 5/9/18
235	LEAD TIME MAJOR EQUIPMENT I.E. TUNNEL WASH, STERILIZER, ANIMAL WATERING SYSTEM	TBD	80 days	Thu 5/10/18	Thu 8/30/18
236	PREPARE REMAINING SUBMITTALS	TBD	20 days	Wed 3/7/18	Tue 4/3/18
237	REVIEW REMAINING SUBMITTALS	A&E	20 days	Wed 4/4/18	Tue 5/1/18
238	APPROVE REMAINING SUBMITTALS	A&E	0 days	Tue 5/1/18	Tue 5/1/18
239	MATERIAL ORDERING FABRICATION LEAD TIME	TBD	30 days	Wed 5/2/18	Tue 6/12/18
240	**BUILDING DEPARTMENT PLAN CHECK PROCESS**	**LADBS**	**109 days**	**Tue 4/24/18**	**Tue 9/25/18**
241	OPEN CASE MANAGEMENT WITH BUILDING DEPT	HC/A&E	2 days	Tue 4/24/18	Wed 4/25/18
242	VERIFY PLAN CHECK PERIOD WITH BLDG DEPT	HC/A&E	2 days	Tue 4/24/18	Wed 4/25/18
243	SUBMIT PLAN CHECK - ARCHITECTURAL PACKAGE	A&E	0 days	Mon 5/7/18	Mon 5/7/18
244	PLAN CHECK PERIOD	LADBS	30 days	Tue 5/8/18	Mon 6/18/18
245	SUBMIT FIRE DEPARTMENT PACKAGE	A&E	1 day	Thu 4/26/18	Thu 4/26/18
246	FIRE DEPARTMENT PLAN CHECK PERIOD	LADBS	25 days	Fri 4/27/18	Thu 5/31/18
247	FIRE DEPARTMENT APPROVAL	LADBS	2 days	Fri 6/1/18	Mon 6/4/18
248	INCORPORATE PLAN CHECK COMMENTS	A&E	15 days	Tue 6/19/18	Tue 7/10/18
249	PLAN CHECK - 2ND REVIEW	LADBS	25 days	Wed 7/11/18	Tue 8/14/18
250	RTI ARCHITECTURAL ON HOLD PENDING M,P,E	A&E	4 days	Wed 8/15/18	Mon 8/20/18
251	SUBMIT PLAN CHECK PACKAGE M,P,E,	A&E	1 day	Tue 5/8/18	Tue 5/8/18
252	PLAN CHECK PERIOD - M, P, E	LADBS	30 days	Wed 5/9/18	Tue 6/19/18
253	MECHANICAL PLAN APPROVAL	LADBS	1 day	Wed 6/20/18	Wed 6/20/18
254	PLUMBING, ELECTRICAL APPROVAL	LADBS	1 day	Wed 6/20/18	Wed 6/20/18
255	M,P,E PACKAGE RTI	LADBS	1 day	Thu 6/21/18	Thu 6/21/18
256	FINAL BACKCHECK/SECURE BUILDING PERMIT	HC/CCD	25 days	Tue 8/21/18	Tue 9/25/18
257	**CONSTRUCTION - SCENARIO B**	**HC**	**253 days**	**Wed 9/26/18**	**Thu 9/19/19**
258	CONSTRUCTION IMPACT COORDINATION (OTHER TENENTS)	HC/HMR	2 days	Wed 9/26/18	Thu 9/27/18
259	MOBILIZATION	HC	10 days	Wed 9/26/18	Tue 10/9/18



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SCHEDULE DETAILS
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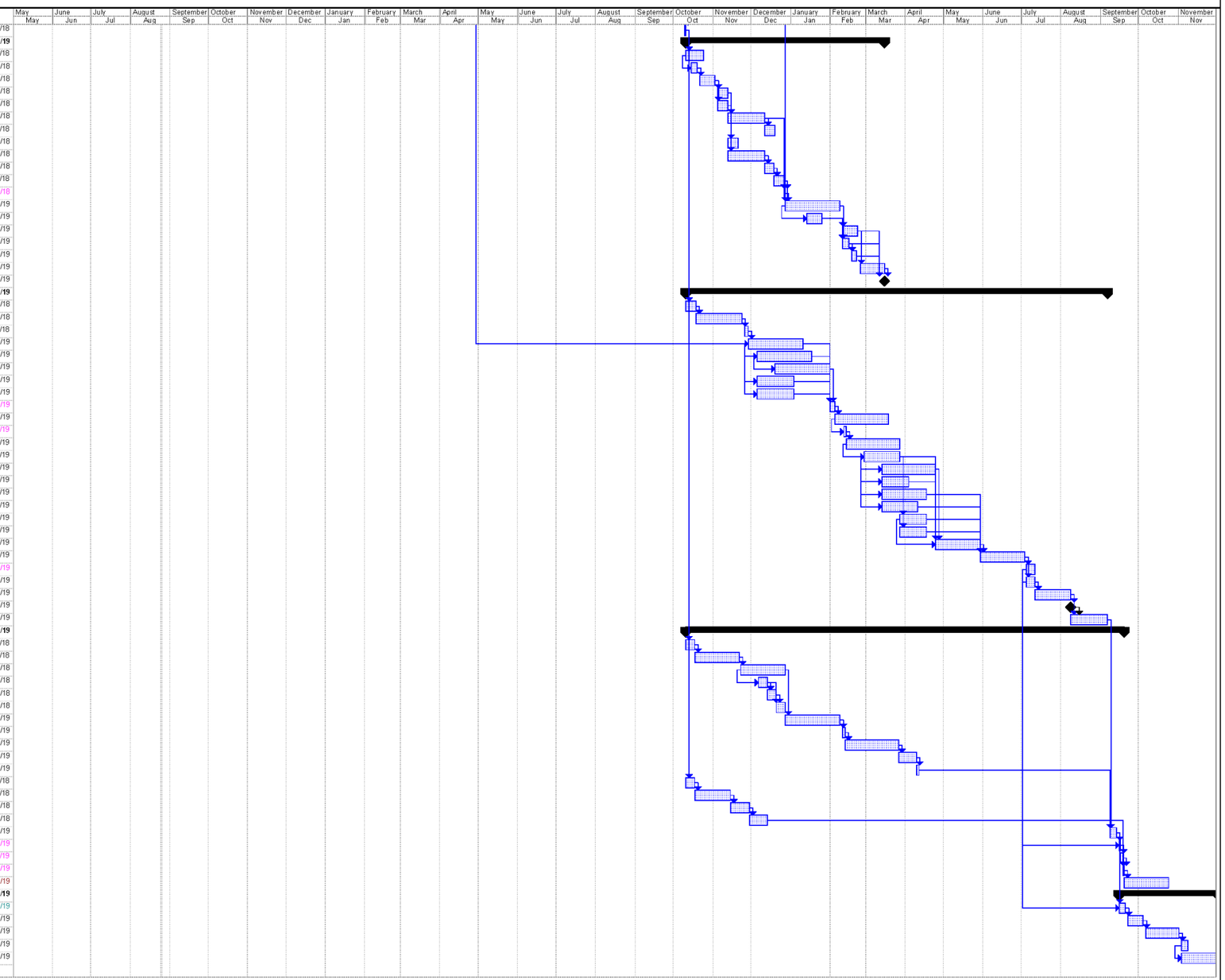
UNIVERSITY OF SOUTHERN CALIFORNIA
HMR VIVARIUM RENOVATION

PRELIMINARY PROJECT SCHEDULE
DRAFT #7

HAMILTON CONSTRUCTION
August 25, 2017

ID	Task Name	Resource Names	Duration	Start	Finish
260	SUBCONTRACTORS COORDINATION	HC	1 day	Wed 10/10/18	Wed 10/10/18
261	**BASEMENT**		**110 days**	**Thu 10/11/18**	**Fri 3/15/19**
262	REWORK EXISTING PLUMBING AT CAGE WASH AREA	TBD	10 days	Thu 10/11/18	Wed 10/24/18
263	RELOACTE STEAM GENERATOR	TBD	5 days	Mon 10/15/18	Fri 10/19/18
264	SLECTIVE DEMO	TBD	10 days	Mon 10/22/18	Fri 11/2/18
265	MODIFICATION TO EXISTING WALLS	TBD	6 days	Mon 11/5/18	Mon 11/12/18
266	COVER TRENCH DRAIN AT NEW DOORWAY	TBD	6 days	Mon 11/5/18	Mon 11/12/18
267	NEW MPE INFRASTRUCTURE FOR TUNNEL WASH & STERILIZER	TBD	20 days	Tue 11/13/18	Tue 12/11/18
268	INSTALL NEW SHIELDING AT DRYHEAT STERILIZER	TBD	6 days	Wed 12/12/18	Wed 12/19/18
269	INSTALL NEW AUTOMATIC SLIDING DOOR	TBD	6 days	Tue 11/13/18	Tue 11/20/18
270	INSTALL NEW STAINLESS STEEL EXHAUST DUCT	TBD	20 days	Tue 11/13/18	Tue 12/11/18
271	INSTALL NEW ST. ST. CANOPY FOR NEW STERILIZER	TBD	5 days	Wed 12/12/18	Tue 12/18/18
272	REFINISH EPOXY FLOORING	TBD	6 days	Wed 12/19/18	Wed 12/26/18
273	ROUGH-IN INSPECTION	LADBS	1 day	Thu 12/27/18	Thu 12/27/18
274	INSTALL NEW TUNNEL WASHER	TBD	30 days	Fri 12/28/18	Fri 2/8/19
275	INSATALL NEW STERILIZER	TBD	10 days	Mon 1/14/19	Fri 1/25/19
276	MPE CONENCTION AT NEW EQUIPMENT	TBD	10 days	Mon 2/11/19	Fri 2/22/19
277	NEW ST. ST. CALDDING AT WALLS	TBD	5 days	Mon 2/11/19	Fri 2/15/19
278	NEW DOOR & HARDWARE	TBD	4 days	Mon 2/18/19	Thu 2/21/19
279	EQUIPMENT START-UP , TESTING CALIBORATION	TBD	15 days	Mon 2/25/19	Fri 3/15/19
280	READY FOR PUNCH LIST	TBD	0 days	Fri 3/15/19	Fri 3/15/19
281	**HOLDING / PROCEDURE ROOMS - FLOOR 2 - 9**		**233 days**	**Thu 10/11/18**	**Fri 9/6/19**
282	CONSTRUCT DUST PARTITIONS - IMPLIMENT PROTECIVE MEASL	TBD	6 days	Thu 10/11/18	Thu 10/18/18
283	INTERIOR DEMOLITION	TBD	25 days	Fri 10/19/18	Fri 11/23/18
284	LAY-OUTS	TBD	3 days	Mon 11/26/18	Wed 11/28/18
285	INSTALL INTERIOR WALL FRAMING	TBD	30 days	Thu 11/29/18	Thu 1/10/19
286	HVAC ROGH-IN DUCT WORK / MIXING BOXES	TBD	30 days	Thu 12/6/18	Thu 1/17/19
287	INSTALL INTERIOR CEILING FRAMING	TBD	30 days	Thu 12/20/18	Thu 1/31/19
288	ROGH-IN IN WALL ELECTRICAL	TBD	20 days	Thu 12/6/18	Thu 1/3/19
289	ROUGH-IN INWALL PLMBING	TBD	20 days	Thu 12/6/18	Thu 1/3/19
290	ROUGH- IN INSPECTIONS	LADBS	2 days	Fri 2/1/19	Mon 2/4/19
291	INSTALL SHEATING / REINFORCING MESH	TBD	30 days	Tue 2/5/19	Mon 3/18/19
292	DRYWALL SCREW INSPECTION	LADBS	2 days	Tue 2/12/19	Wed 2/13/19
293	INSTALL PRIMER & FINISH	TBD	30 days	Thu 2/14/19	Wed 3/27/19
294	APPLY EPOXY PAINT WALLS / CEILING	TBD	20 days	Thu 2/28/19	Wed 3/27/19
295	INSTALL OVERHEAD PIPING FOR WATERING SYSTEM	TBD	30 days	Thu 3/14/19	Wed 4/24/19
296	INSATLL LIGHT LIGHT FIXTURES	TBD	15 days	Thu 3/14/19	Wed 4/3/19
297	INSTALL HORIZONTAL DUCT DISTRIBUTION	TBD	25 days	Thu 3/14/19	Wed 4/17/19
298	INSTALL PLUMBING FIXTURES	TBD	20 days	Thu 3/14/19	Wed 4/10/19
299	INSTALL DOOR & HARDWARE	TBD	15 days	Thu 3/28/19	Wed 4/17/19
300	INSATALL ELECTRICAL DEVICES	TBD	15 days	Thu 3/28/19	Wed 4/17/19
301	INSATLL EPOXY FLOORING	TBD	25 days	Thu 4/25/19	Wed 5/29/19
302	EQUIPMENT START UP / TEST & BALANCE	TBD	25 days	Thu 5/30/19	Wed 7/3/19
303	FINAL INSPECTIONS	LADBS	5 days	Fri 7/5/19	Thu 7/11/19
304	PREPARE INTERIOR PUNCH LIST	TBD	5 days	Fri 7/5/19	Thu 7/11/19
305	COMPLETE INTERIOR PUNCH LIST	TBD	20 days	Fri 7/12/19	Thu 8/8/19
306	READY FOR OFCI	TBD	0 days	Thu 8/8/19	Thu 8/8/19
307	INSTALL OFCI	TBD	20 days	Fri 8/9/19	Fri 9/6/19
308	**EXTERIOR WORK**		**242 days**	**Thu 10/11/18**	**Thu 9/19/19**
309	INSATLL SCAFFOLDING	TBD	5 days	Thu 10/11/18	Wed 10/17/18
310	INSATLL STRUCTURAL FRAMING FOR DUCT SHAFT	TBD	25 days	Thu 10/18/18	Wed 11/21/18
311	INSATLL NEW EXHAUST DUCT	TBD	25 days	Fri 11/23/18	Thu 12/27/18
312	INSATLL NEW EXHAUST FAN	TBD	5 days	Fri 12/7/18	Thu 12/13/18
313	ELCTRICAL CONNECTION AT EXHASUT FAN	TBD	5 days	Fri 12/14/18	Thu 12/20/18
314	START-UP / TEST & BALANCE	TBD	5 days	Fri 12/21/18	Thu 12/27/18
315	INSATLL FRAMING AT EXHAUST SHAFT	TBD	30 days	Fri 12/28/18	Fri 2/8/19
316	FRAMING INSPECTION	TBD	2 days	Mon 2/11/19	Tue 2/12/19
317	LATH AND PLASTER	TBD	30 days	Wed 2/13/19	Tue 3/26/19
318	EXTERIOR PAINTING	TBD	10 days	Wed 3/27/19	Tue 4/9/19
319	REMOVE SCAFFOLDING	TBD	2 days	Wed 4/10/19	Thu 4/11/19
320	INSTALL CONCRETE PAD FOR EMERGENCY GENERATOR	TBD	5 days	Thu 10/11/18	Wed 10/17/18
321	INSTALL NEW EMERGENCY GENERATOR	TBD	20 days	Thu 10/18/18	Wed 11/14/18
322	INSTALL NEW ATS AND DISTRIUTIOPN BOARD	TBD	10 days	Thu 11/15/18	Thu 11/29/18
323	EMERGENCY GENERATOR TESTING	TBD	10 days	Fri 11/30/18	Thu 12/13/18
324	FINAL CLEAN-UP	TBD	5 days	Mon 9/9/19	Fri 9/13/19
325	FIRE DEPARTMENT INSPECTION	LADBS	1 day	Mon 9/16/19	Mon 9/16/19
326	PLUMBING, MECHANICAL, ELECTRICAL INSPECTIONS	LADBS	2 days	Tue 9/17/19	Wed 9/18/19
327	FINAL INSPECTION	LADBS	1 day	Thu 9/19/19	Thu 9/19/19
328	MOVE-IN	DAR	25 days	Fri 9/20/19	Thu 10/24/19
329	**PUNCH LIST / CLOSE OUTS - SCENARIO B**		**55 days**	**Mon 9/16/19**	**Mon 12/2/19**
330	PREPARE PUNCH LIST	A&E	5 days	Mon 9/16/19	Fri 9/20/19
331	DISTRIBUTE / ADMISTRE PUNCH LIST	HC	10 days	Mon 9/23/19	Fri 10/4/19
332	COMPLETE PUNCH LIST ITEMS	TBD	20 days	Mon 10/7/19	Fri 11/1/19
333	SUBMIT AS-BUILTS O&M	HC	5 days	Mon 11/4/19	Fri 11/8/19
334	CLOSE OUT CONTRACT	HC/CRB/CCD	20 days	Mon 11/4/19	Mon 12/2/19
335					



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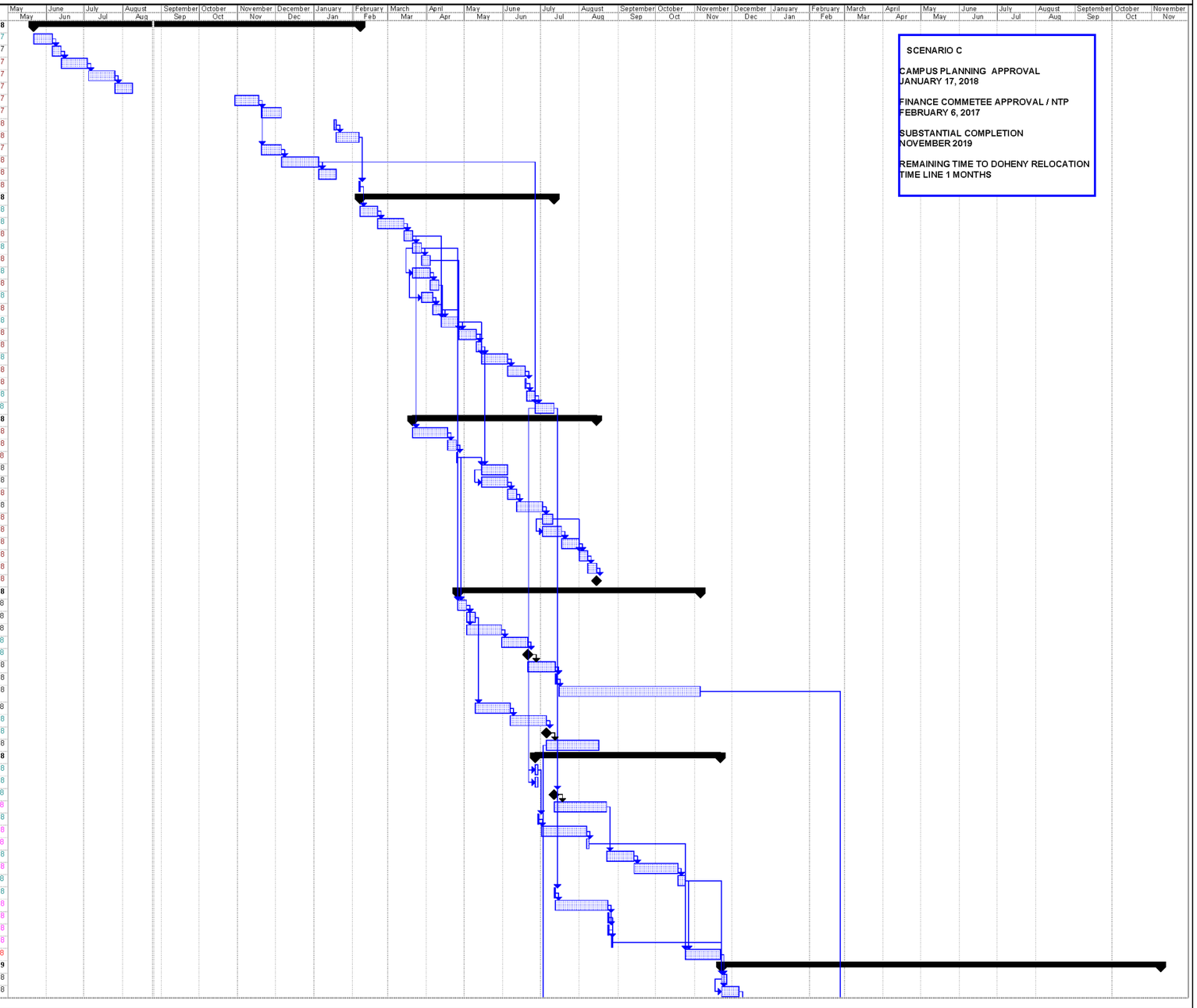
UNIVERSITY OF SOUTHERN CALIFORNIA
HMR VIVARIUM RENOVATION

PRELIMINARY PROJECT SCHEDULE
DRAFT #7

HAMILTON CONSTRUCTION
August 25, 2017

ID	Task Name	Resource Names	Duration	Start	Finish
336	**CONCLUDE FEASIBILITY STUDY - A&E SELECTION - SCENARIO C**	**CCD**	**180 days**	**Mon 5/22/17**	**Tue 2/6/18**
337	FEASIBILITY STUDY	DFS	10 days	Mon 5/22/17	Mon 6/5/17
338	PREPARE COST & PRELIMINARY SCHEDULE	HC	5 days	Tue 6/6/17	Mon 6/12/17
339	PREPARE MOU	CCD	15 days	Tue 6/13/17	Mon 7/3/17
340	CCD / USC REVIEW OF COST, SCHEDULE, MOU	CCD	15 days	Wed 7/5/17	Tue 7/25/17
341	PREPARE DOC FOR BOARD REVIEW	CCD	10 days	Wed 7/26/17	Tue 8/8/17
342	BOARD SUBMITTAL	CCD	15 days	Mon 10/30/17	Fri 11/17/17
343	WAITING PERIOD - BOARD OF TRUSTEE MEETING	CCD	10 days	Mon 11/20/17	Tue 12/5/17
344	CAMPUS PLANNING - APPROVAL	BOARD	2 days	Wed 1/17/18	Thu 1/18/18
345	FINANCE COMMITTEE REVIEW AND APPROVAL	FINANCE	12 days	Fri 1/19/18	Mon 2/5/18
346	PREPARE RFP PACKAGE FOR A&E	CCD	10 days	Mon 11/20/17	Tue 12/5/17
347	DISTRIBUTE RFP FOR A&E - RFP PERIOD	CCD	20 days	Wed 12/6/17	Thu 1/4/18
348	A & E INTERVIEW - SELECT THE DESIGN TEAM	CCD	10 days	Fri 1/5/18	Thu 1/18/18
349	NTP DESIGN	CCD	1 day	Tue 2/6/18	Tue 2/6/18
350	**DESIGN - SCENARIO C**	**CRB**	**110 days**	**Wed 2/7/18**	**Wed 7/11/18**
351	PROGRAM REVIEW / VALIDATION	A&E	10 days	Wed 2/7/18	Tue 2/20/18
352	SCHEMATIC DESIGN	A&E	15 days	Wed 2/21/18	Tue 3/13/18
353	REVIEW / APPROVE SCHEMATIC DESIGN	DAR / CCD	5 days	Wed 3/14/18	Tue 3/20/18
354	CONFIGURE TUNNEL WASH STERILIZER LAYOUT	A&E	5 days	Wed 3/21/18	Tue 3/27/18
355	REVIEW & APPROVE TUNNEL WASH / STERILIZER	VSOE	5 days	Wed 3/28/18	Tue 4/3/18
356	CONFIGURE HOLDING / PROCEDURE ROOMS LAY OUT	A&E	10 days	Wed 3/21/18	Tue 4/3/18
357	REVIEW / APPROVE HOLDING / PROCEDURE ROOMS LAY OUT	DAR / CCD	5 days	Wed 4/4/18	Tue 4/10/18
358	CONFIGURE ANIMAL WATERING SYSTEM LAYOUT	A&E	7 days	Wed 3/28/18	Thu 4/5/18
359	REVIEW / APPROVE ANIMAL WATERING SYSTEM LAYOUT	DAR / CCD	5 days	Fri 4/6/18	Thu 4/12/18
360	PREPARE 50% CONSTRUCTION DOC. (CD)	A&E	10 days	Fri 4/13/18	Thu 4/26/18
361	REVIEW 50% CD	FMS/CCD / DAR	10 days	Fri 4/27/18	Thu 5/10/18
362	SUBMIT COMMENTS ON 50% CD	FMS/CCD / DAR	2 days	Fri 5/11/18	Mon 5/14/18
363	PREPARE 90% CONSTRUCTION DOC.	A&E	15 days	Tue 5/15/18	Mon 6/4/18
364	REVIEW 90% CD	FMS/CCD / DAR	10 days	Tue 6/5/18	Mon 6/18/18
365	SUBMIT 90% REVIEW COMMENTS	FMS/CCD / DAR	1 day	Tue 6/19/18	Tue 6/19/18
366	INCORPORATE USC/FMS COMMETS IN 90% CD	A&E	5 days	Wed 6/20/18	Tue 6/26/18
367	PREPARE 100% CONSTRUCTION DOC	A&E	10 days	Wed 6/27/18	Wed 7/11/18
368	**GC SELECTION - GMP PROCESS - SCENARIO C**		**104 days**	**Wed 3/21/18**	**Tue 8/14/18**
369	PREPARE / DISTRIBUTE RFP FOR GC (PRECON)	HC	20 days	Wed 3/21/18	Tue 4/17/18
370	INTERVIEW / SELECT GC	CCD	5 days	Wed 4/18/18	Tue 4/24/18
371	NTP TO GC	CCD	1 day	Wed 4/25/18	Wed 4/25/18
372	PREPARE COST ESTIMATE FOR 50% CD	GC	15 days	Tue 5/15/18	Mon 6/4/18
373	PREPARE CONSDTRUCTIBILITY REPORT FOR 50% CD	GC	15 days	Tue 5/15/18	Mon 6/4/18
374	REVIEW 50% CD COST ESTIMATE	CCD	5 days	Tue 6/5/18	Mon 6/11/18
375	PREPARE COST ESTIMATE FOR 90% CD	GC	15 days	Tue 6/12/18	Mon 7/2/18
376	REVIEW 90% CD COST ESTIMATE	TEAM	5 days	Tue 7/3/18	Tue 7/10/18
377	PREPARE MOU FOR CONSTRUCTION	CCD	10 days	Tue 7/3/18	Tue 7/17/18
378	MOU REVIEW AND APPROVAL	CCD / USC	10 days	Wed 7/18/18	Tue 7/31/18
379	NEGOTIATE - FINALIZE GMP	CCD	5 days	Wed 8/1/18	Tue 8/7/18
380	PREPARE GC CONTRACT AMENDMENT	CCD	5 days	Wed 8/8/18	Tue 8/14/18
381	NTP GC - FOR CONSTRUCTION	CCD	0 days	Tue 8/14/18	Tue 8/14/18
382	**SUBCONTRACT BID / AWARD - SUBMITTAL PROCESS**		**136 days**	**Thu 4/26/18**	**Mon 11/5/18**
383	NOTICE PROCEED - MAJOR EQUIPMENT	GC	5 days	Thu 4/26/18	Wed 5/2/18
384	NOTICE TO PROCEED TRADE SUBCONTRACTORS	GC	5 days	Thu 5/3/18	Wed 5/9/18
385	PREPARE MAJOR EQUIPMENT SHOP DRAWINGS	TBD	20 days	Thu 5/3/18	Wed 5/30/18
386	REVIEW MAJOR EQUIPMENT SHOP DRAWINGS	CRB	15 days	Thu 5/31/18	Wed 6/20/18
387	APPROVE MAJOR EQUIPMENT SUBMITTALS	CRB	0 days	Wed 6/20/18	Wed 6/20/18
388	INCORPORATE APPROVAL COMENTS IN MAJOR EQUIP.	TBD	15 days	Thu 6/21/18	Thu 7/12/18
389	RELEASE MAJOR EQUIPMENT FABRICATION	TBD	1 day	Fri 7/13/18	Fri 7/13/18
390	LEAD TIME MAJOR EQUIPMENT I.E. TUNNEL WASH, STERILIZER, ANIMAL WATERING SYSTEM	TBD	80 days	Mon 7/16/18	Mon 11/5/18
391	PREPARE REMAINING SUBMITTALS	TBD	20 days	Thu 5/10/18	Wed 6/6/18
392	REVIEW REMAINING SUBMITTALS	A&E	20 days	Thu 6/7/18	Thu 7/5/18
393	APPROVE REMAINING SUBMITTALS	A&E	0 days	Thu 7/5/18	Thu 7/5/18
394	MATERIAL ORDERING FABRICATION LEAD TIME	TBD	30 days	Fri 7/6/18	Thu 8/16/18
395	**BUILDING DEPARTMENT PLAN CHECK PROCESS**	**LADBS**	**104 days**	**Wed 6/27/18**	**Wed 11/21/18**
396	OPEN CASE MANAGEMENT WITH BUILDING DEPT	HC/A&E	2 days	Wed 6/27/18	Thu 6/28/18
397	VERIFY PLAN CHECK PERIOD WITH BLDG DEPT	HC/A&E	2 days	Wed 6/27/18	Thu 6/28/18
398	SUBMIT PLAN CHECK - ARCHITECTURAL PACKAGE	A&E	0 days	Wed 7/11/18	Wed 7/11/18
399	PLAN CHECK PERIOD	LADBS	30 days	Thu 7/12/18	Wed 8/22/18
400	SUBMIT FIRE DEPARTMENT PACKAGE	A&E	1 day	Fri 6/29/18	Fri 6/29/18
401	FIRE DEPARTMENT PLAN CHECK PERIOD	LADBS	25 days	Mon 7/2/18	Mon 8/6/18
402	FIRE DEPARTMENT APPROVAL	LADBS	2 days	Tue 8/7/18	Wed 8/8/18
403	INCORPORATE PLAN CHECK COMMENTS	A&E	15 days	Thu 8/23/18	Thu 9/13/18
404	PLAN CHECK - 2ND REVIEW	LADBS	25 days	Fri 9/14/18	Thu 10/18/18
405	RTI ARCHITECTURAL ON HOLD PENDING M,P,E	A&E	4 days	Fri 10/19/18	Wed 10/24/18
406	SUBMIT PLAN CHECK PACKAGE M,P,E,	A&E	1 day	Thu 7/12/18	Thu 7/12/18
407	PLAN CHECK PERIOD - M, P, E	LADBS	30 days	Fri 7/13/18	Thu 8/23/18
408	MECHANICAL PLAN APPROVAL	LADBS	1 day	Fri 8/24/18	Fri 8/24/18
409	PLUMBING, ELECTRICAL APPROVAL	LADBS	1 day	Fri 8/24/18	Fri 8/24/18
410	M,P,E PACKAGE RTI	LADBS	1 day	Mon 8/27/18	Mon 8/27/18
411	FINAL BACKCHECK/SECURE BUILDING PERMIT	HC/CCD	20 days	Thu 10/25/18	Wed 11/21/18
412	**CONSTRUCTION - SCENARIO C**	**HC**	**248 days**	**Fri 11/23/18**	**Fri 11/8/19**
413	CONSTRUCTION IMPACT COORDINATION (OTHER TENENTS)	HC/HMR	2 days	Fri 11/23/18	Mon 11/26/18
414	MOBILIZATION	HC	10 days	Fri 11/23/18	Thu 12/6/18



SCENARIO C

CAMPUS PLANNING APPROVAL
JANUARY 17, 2018

FINANCE COMMETEE APPROVAL / NTP
FEBRUARY 6, 2017

SUBSTANTIAL COMPLETION
NOVEMBER 2019

REMAINING TIME TO DOHENY RELOCATION
TIME LINE 1 MONTHS

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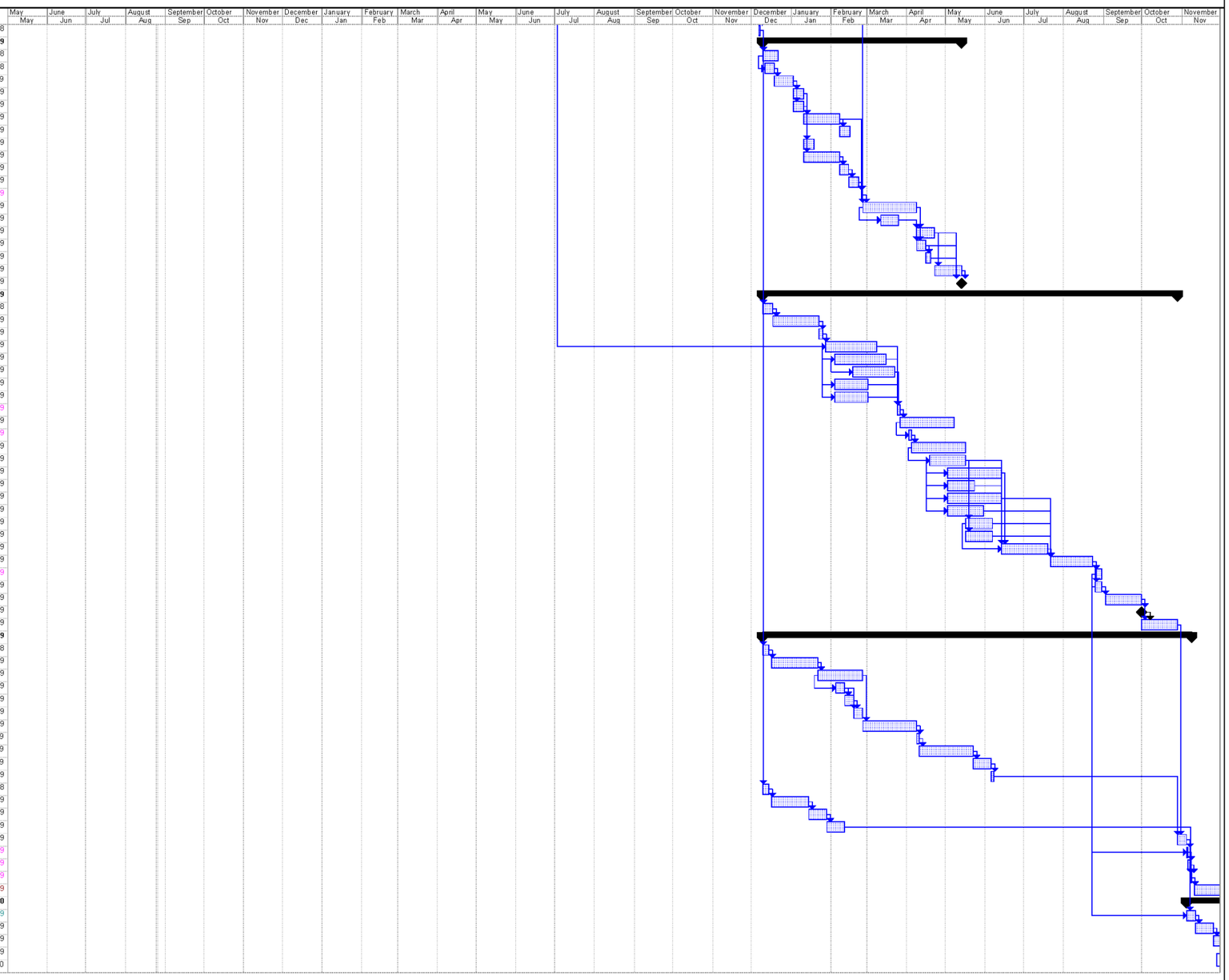
SCHEDULE DETAILS
(continued)

UNIVERSITY OF SOUTHERN CALIFORNIA
HMR VIVARIUM RENOVATION

PRELIMINARY PROJECT SCHEDULE
DRAFT #7

HAMILTON CONSTRUCTION
August 25, 2017

ID	Task Name	Resource Names	Duration	Start	Finish
415	SUBCONTRACTORS COORDINATION	HC	1 day	Fri 12/7/18	Fri 12/7/18
416	**BASEMENT**		**110 days**	**Mon 12/10/18**	**Mon 5/13/19**
417	REWORK EXISTING PLUMBING AT CAGE WASH AREA	TBD	10 days	Mon 12/10/18	Fri 12/21/18
418	RELOACTE STEAM GENERATOR	TBD	5 days	Wed 12/12/18	Tue 12/18/18
419	SLECTIVE DEMO	TBD	10 days	Wed 12/19/18	Wed 1/2/19
420	MODIFICATION TO EXISTING WALLS	TBD	6 days	Thu 1/3/19	Thu 1/10/19
421	COVER TRENCH DRAIN AT NEW DOORWAY	TBD	6 days	Thu 1/3/19	Thu 1/10/19
422	NEW MPE INFRASTRUCTURE FOR TUNNEL WASH & STERILIZER	TBD	20 days	Fri 1/11/19	Thu 2/7/19
423	INSTALL NEW SHIELDING AT DRYHEAT STERILIZER	TBD	6 days	Fri 2/8/19	Fri 2/15/19
424	INSTALL NEW AUTOMATIC SLIDING DOOR	TBD	6 days	Fri 1/11/19	Fri 1/18/19
425	INSTALL NEW STAINLESS STEEL EXHAUST DUCT	TBD	20 days	Fri 1/11/19	Thu 2/7/19
426	INSTALL NEW ST. ST. CANOPY FOR NEW STERILIZER	TBD	5 days	Fri 2/8/19	Thu 2/14/19
427	REFINISH EPOXY FLOORING	TBD	6 days	Fri 2/15/19	Fri 2/22/19
428	ROUGH-IN INSPECTION	LADBS	1 day	Mon 2/25/19	Mon 2/25/19
429	INSTALL NEW TUNNEL WASHER	TBD	30 days	Tue 2/26/19	Mon 4/8/19
430	INSATALL NEW STERILIZER	TBD	10 days	Tue 3/12/19	Mon 3/25/19
431	MPE CONENCTION AT NEW EQUIPMENT	TBD	10 days	Tue 4/9/19	Mon 4/22/19
432	NEW ST. ST. CALDDING AT WALLS	TBD	5 days	Tue 4/9/19	Mon 4/15/19
433	NEW DOOR & HARDWARE	TBD	4 days	Tue 4/16/19	Fri 4/19/19
434	EQUIPMENT START-UP , TESTING CALIBORATION	TBD	15 days	Tue 4/23/19	Mon 5/13/19
435	READY FOR PUNCH LIST	TBD	0 days	Mon 5/13/19	Mon 5/13/19
436	**HOLDING / PROCEDURE ROOMS - FLOOR 2 - 9**		**228 days**	**Mon 12/10/18**	**Mon 10/28/19**
437	CONSTRUCT DUST PARTITIONS - IMPLIMENT PROTECIVE MEASU	TBD	6 days	Mon 12/10/18	Mon 12/17/18
438	INTERIOR DEMOLITION	TBD	25 days	Tue 12/18/18	Tue 1/22/19
439	LAY-OUTS	TBD	3 days	Wed 1/23/19	Fri 1/25/19
440	INSTALL INTERIOR WALL FRAMING	TBD	30 days	Mon 1/28/19	Fri 3/8/19
441	HVAC ROGH-IN DUCT WORK / MIXING BOXES	TBD	30 days	Mon 2/4/19	Fri 3/15/19
442	INSTALL INTERIOR CEILING FRAMING	TBD	25 days	Mon 2/18/19	Fri 3/22/19
443	ROGH-IN IN WALL ELECTRICAL	TBD	20 days	Mon 2/4/19	Fri 3/1/19
444	ROUGH-IN INWALL PLMBING	TBD	20 days	Mon 2/4/19	Fri 3/1/19
445	ROUGH- IN INSPECTIONS	LADBS	2 days	Mon 3/25/19	Tue 3/26/19
446	INSTALL SHEATING / REINFORCING MESH	TBD	30 days	Wed 3/27/19	Tue 5/7/19
447	DRYWALL SCREW INSPECTION	LADBS	2 days	Wed 4/3/19	Thu 4/4/19
448	INSTALL PRIMER & FINISH	TBD	30 days	Fri 4/5/19	Thu 5/16/19
449	APPLY EPOXY PAINT WALLS / CEILING	TBD	20 days	Fri 4/19/19	Thu 5/16/19
450	INSTALL OVERHEAD PIPING FOR WATERING SYSTEM	TBD	30 days	Fri 5/3/19	Thu 6/13/19
451	INSATLL LIGHT LIGHT FIXTURES	TBD	15 days	Fri 5/3/19	Thu 5/23/19
452	INSTALL HORIZONTAL DUCT DISTRIBUTION	TBD	30 days	Fri 5/3/19	Thu 6/13/19
453	INSTALL PLUMBING FIXTURES	TBD	20 days	Fri 5/3/19	Thu 5/30/19
454	INSTALL DOOR & HARDWARE	TBD	15 days	Fri 5/17/19	Thu 6/6/19
455	INSATALL ELECTRICAL DEVICES	TBD	15 days	Fri 5/17/19	Thu 6/6/19
456	INSATLL EPOXY FLOORING	TBD	25 days	Fri 6/14/19	Fri 7/19/19
457	EQUIPMENT START UP / TEST & BALANCE	TBD	25 days	Mon 7/22/19	Fri 8/23/19
458	FINAL INSPECTIONS	LADBS	5 days	Mon 8/26/19	Fri 8/30/19
459	PREPARE INTERIOR PUNCH LIST	TBD	5 days	Mon 8/26/19	Fri 8/30/19
460	COMPLETE INTERIOR PUNCH LIST	TBD	20 days	Tue 9/3/19	Mon 9/30/19
461	READY FOR OFCI	TBD	0 days	Mon 9/30/19	Mon 9/30/19
462	INSTALL OFCI	TBD	20 days	Tue 10/1/19	Mon 10/28/19
463	**EXTERIOR WORK**		**237 days**	**Mon 12/10/18**	**Fri 11/8/19**
464	INSATLL SCAFFOLDING	TBD	5 days	Mon 12/10/18	Fri 12/14/18
465	INSATLL STRUCTURAL FRAMING FOR DUCT SHAFT	TBD	25 days	Mon 12/17/18	Mon 1/21/19
466	INSATLL NEW EXHAUST DUCT	TBD	25 days	Tue 1/22/19	Mon 2/25/19
467	INSATLL NEW EXHAUST FAN	TBD	5 days	Tue 2/5/19	Mon 2/11/19
468	ELCTRICAL CONNECTION AT EXHASUT FAN	TBD	5 days	Tue 2/12/19	Mon 2/18/19
469	START-UP / TEST & BALANCE	TBD	5 days	Tue 2/19/19	Mon 2/25/19
470	INSATLL FRAMING AT EXHAUST SHAFT	TBD	30 days	Tue 2/26/19	Mon 4/8/19
471	FRAMING INSPECTION	TBD	2 days	Tue 4/9/19	Wed 4/10/19
472	LATH AND PLASTER	TBD	30 days	Thu 4/11/19	Wed 5/22/19
473	EXTERIOR PAINTING	TBD	10 days	Thu 5/23/19	Wed 6/5/19
474	REMOVE SCAFFOLDING	TBD	2 days	Thu 6/6/19	Fri 6/7/19
475	INSTALL CONCRETE PAD FOR EMERGENCY GENERATOR	TBD	5 days	Mon 12/10/18	Fri 12/14/18
476	INSTALL NEW EMERGENCY GENERATOR	TBD	20 days	Mon 12/17/18	Mon 1/14/19
477	INSTALL NEW ATS AND DISTRIUTIOPN BOARD	TBD	10 days	Tue 1/15/19	Mon 1/28/19
478	EMERGENCY GENERATOR TESTING	TBD	10 days	Tue 1/29/19	Mon 2/11/19
479	FINAL CLEAN-UP	TBD	5 days	Tue 10/29/19	Mon 11/4/19
480	FIRE DEPARTMENT INSPECTION	LADBS	1 day	Tue 11/5/19	Tue 11/5/19
481	PLUMBING, MECHANICAL, ELECTRICAL INSPECTIONS	LADBS	2 days	Wed 11/6/19	Thu 11/7/19
482	FINAL INSPECTION	LADBS	1 day	Fri 11/8/19	Fri 11/8/19
483	MOVE-IN	DAR	30 days	Mon 11/11/19	Mon 12/23/19
484	**PUNCH LIST / CLOSE OUTS - SCENARIO C**		**40 days**	**Tue 11/5/19**	**Wed 1/1/20**
485	PREPARE PUNCH LIST	A&E	5 days	Tue 11/5/19	Mon 11/11/19
486	DISTRIBUTE / ADMISTRE PUNCH LIST	GC	10 days	Tue 11/12/19	Mon 11/25/19
487	COMPLETE PUNCH LIST ITEMS	TBD	5 days	Tue 11/26/19	Tue 12/3/19
488	SUBMIT AS-BUILTS O&M	GC	5 days	Wed 12/4/19	Tue 12/10/19
489	CLOSE OUT CONTRACT	GC	20 days	Wed 12/4/19	Wed 1/1/20



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Vivarium Design Guidelines

The latest versions of the *Guide for The Care and Use of Laboratory Animals* **(8th Edition is latest as of date of this report), and** *NIH Design Requirements Manual* **(2016 is latest as of date of this report) shall be referenced for specific vivarium design requirements during the design phase of the project.**

These guidelines provide information for:

- **Environment**
- **Housing**
- **Management**
- **Temperature and humidity**
- **Ventilation and air quality**
- **Illumination**
- **Noise attenuation**
- **Vibration attenuation**
- **Animal housing**
- **Environmental enrichment**
- **Animal space needs**
- **Social environment**
- **Husbandry**
- **Bedding and nesting materials**
- **Sanitation**
- **Bedding/substrate change**
- **Cleaning and disinfectant of microenvironment**
- **Cleaning and disinfectant of macroenvironment**
- **Assessing effectiveness of sanitation**
- **Pest Control**
- **Emergency, weekend, holiday care**
- **Qualitry of life**
- **Planning module**
- **Flexibility and adaptability**
- **Circulation**
- **Zoning**
- **Furniture & equipment**
- **Housing/holding**
- **Finishes and materials**
- **HVAC**
- **Plumging**
- **Electrical**
- **Health and safety**