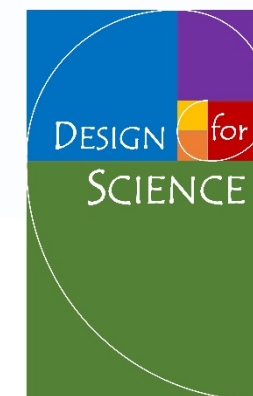
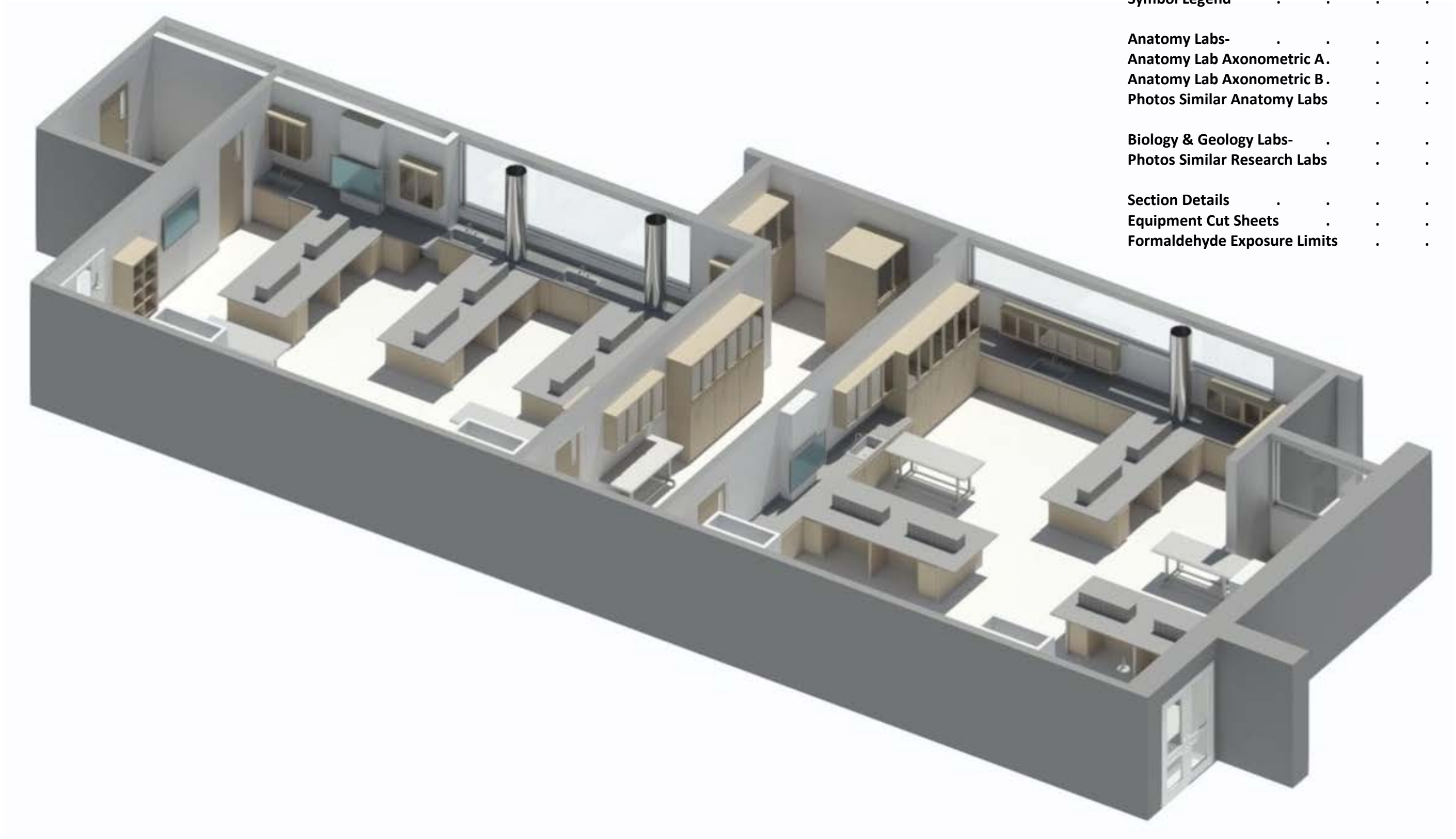


LABORATORY SKETCHBOOK
CSU San Bernardino
2018 Jun 07
Draft #5



CONTENTS

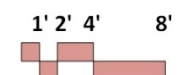
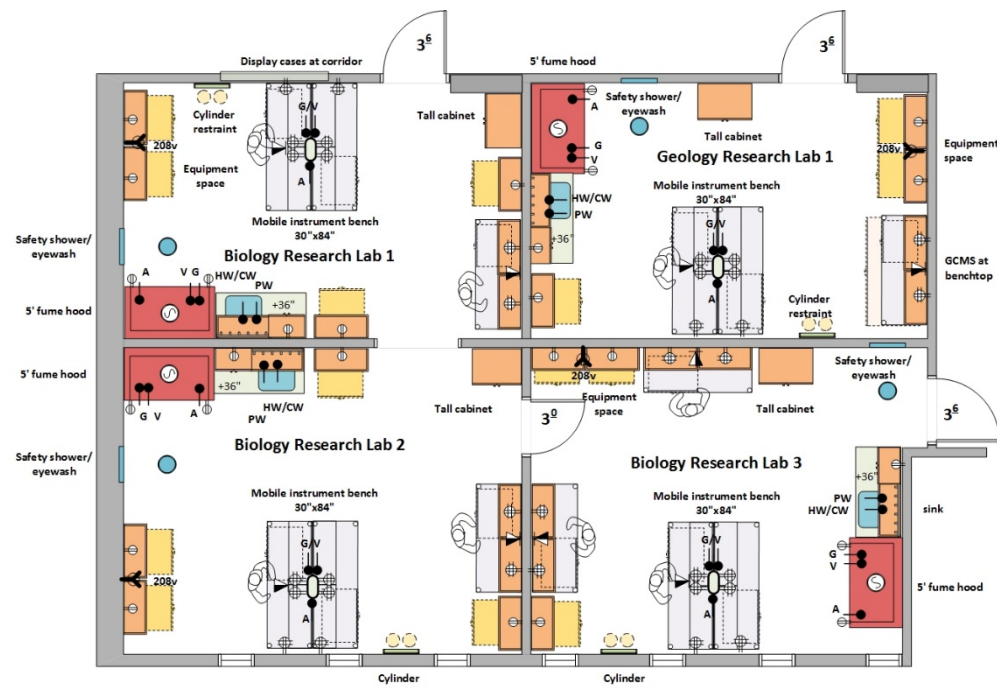
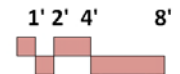
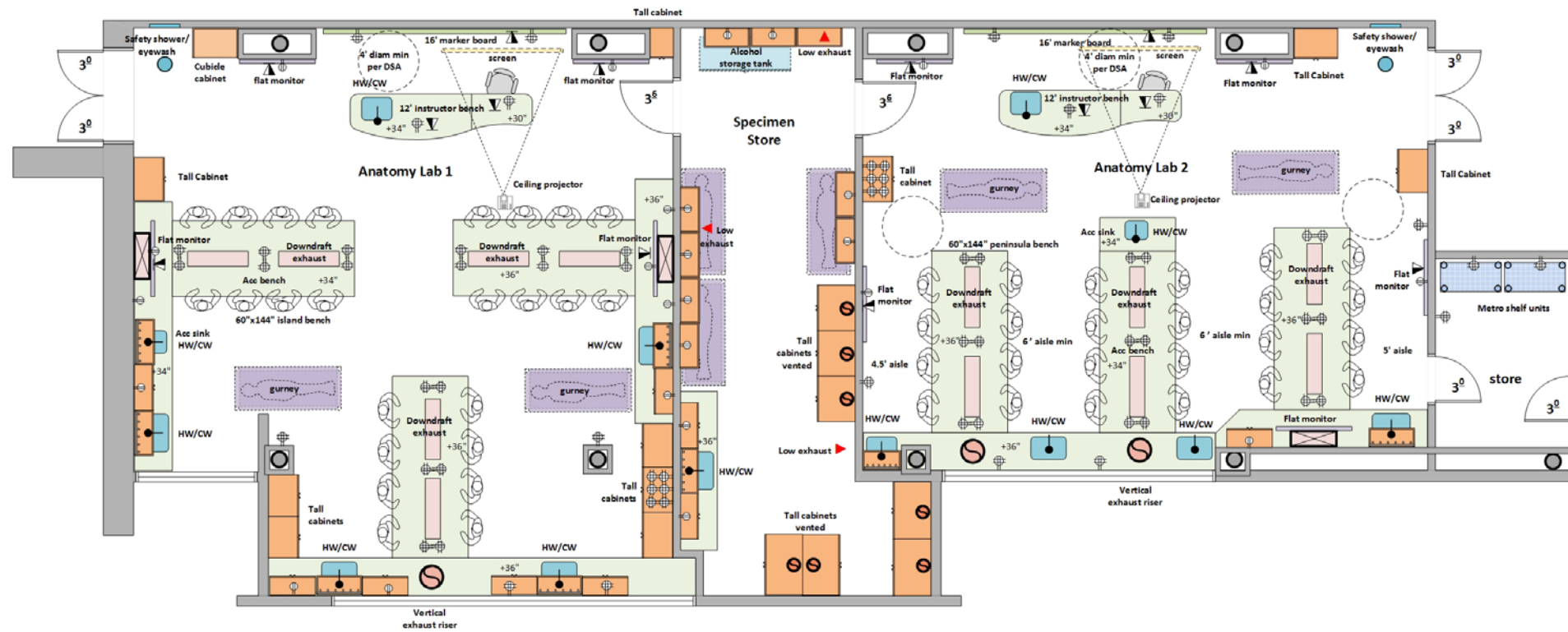
Summary	3
Symbol Legend	4
Anatomy Labs-	5
Anatomy Lab Axonometric A.	7
Anatomy Lab Axonometric B.	8
Photos Similar Anatomy Labs	9
Biology & Geology Labs-	13
Photos Similar Research Labs	15
Section Details	20
Equipment Cut Sheets	31
Formaldehyde Exposure Limits	40



SUMMARY

This is the 5th draft of the laboratory design sketchbook, and serves as the Basis of Design for the anatomy, biology, and geology labs renovation at the Biology (BI) Building at CSU San Bernardino campus. The lab concepts noted herein are based upon information received to date, two faculty/admin review work session held at CSUSB on 2018 Jan 24, and Mar 19; email comments received to date, and go-to meeting held 2018 Feb 28.

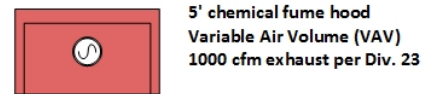
No changes have been made to the Biology/Geology Lab Suite pending direction from CSU regarding the budget requirements for the project.



Glen Berry, AIA
 Laboratory Planning Consultant
 designforscience@icloud.com



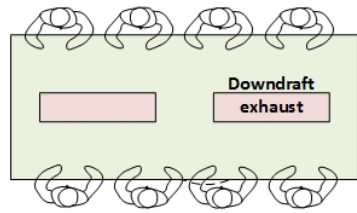
SYMBOL LEGEND



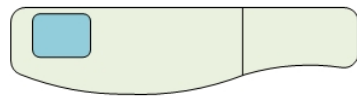
5' chemical fume hood
Variable Air Volume (VAV)
1000 cfm exhaust per Div. 23



Safety shower/
eyewash
Vertical exhaust riser
Anatomy lab peninsula bench



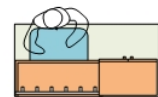
60"x144" peninsula bench
Downdraft exhaust at work surface
Anatomy labs



12' instructor bench
Accessible sink
Anatomy labs



Fixed work surface
30" deep
36" height at standing bench
34" height at acc bench



Sink workstation
30"x60"
Drying rack and shelf above sink
Wall cabinet above at side of sink
Bio/Geo Labs



Accessible (Acc) sink
15" front to back x 5/11" deep x 18" side to side



Anatomy student sink
16" front to back x 17.8" deep x 30" side to side



Sink at fixed bench
Drying rack and shelf above
Anatomy Specimen Store



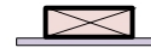
Safety shower/eyewash
Tepid domestic water
Floor drain below
Hard drain connection to eyewash



16' marker board
Anatomy Labs



flat monitor
Anatomy labs



Flat monitor
Mounted on exhaust shaft
Anatomy labs



Cubicle cabinet
36" wide x 8' tall x 24" deep
Anatomy labs



Tall cabinet
36" wide x 24" deep x 96" tall
5 adjustable shelves inside



Tall cabinet with power outlets
36" wide x 24" deep x 96" tall
5 adjustable shelves inside
6 fourplex at back of cabinet for charging
electronic devices (notebook computers,
ipads, etc.)



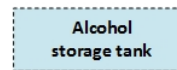
Tall cabinets vented
Wire shelves inside on ball bearing glides
Vented at top- 100 cfm per Div. 23



Equipment space
2 rows shelves above
Open floor space below for owner furnished equipment
(refrigerators, freezers, alcohol storage tank, etc.)
All power on standby and dedicated circuits



Wall cabinet above benchtop
36" wide x 15" deep x 36" tall
2 adjustable shelves inside
Task light valance at bottom of cabinet
Bottom of cabinet light valance at 60" above floor

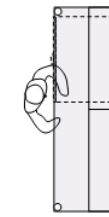


Alcohol storage tank
Owner furnished & installed
~24" wide x ~24" high x ~72" long

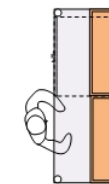
+34"

Indicates benchtop height above floor

+36"



Mobile instrument bench
30"x84"
2 integral rows shelves above
Mobile base cabinet below
Bio/Geo Labs



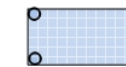
Mobile instrument table at wall
30"x72"
3 rows shelves above at wall
Mobile base cabinet below
Bio/Geo Labs



Cylinder restraint
2 rows P1000 unistrut at wall
Welded link chain restraint
For inert gases only



Gurney
Anatomy labs and Specimen store
Owner furnished and installed



Metro shelf unit
24"Dx48"Wx80"H

HW/CW

Hot/cold water faucet
Infrared sensor
Requires power outlet below sink

PW

Pure water faucet
from building pure water system

G

Natural gas valve

V

Vacuum valve

A

Compressed Air valve
30 psi

⊕

Fourplex 115v power

⊕

Duplex 115v power
Standby power and dedicated circuit at equipment space

208v

208v single phase 20 amp power
Standby

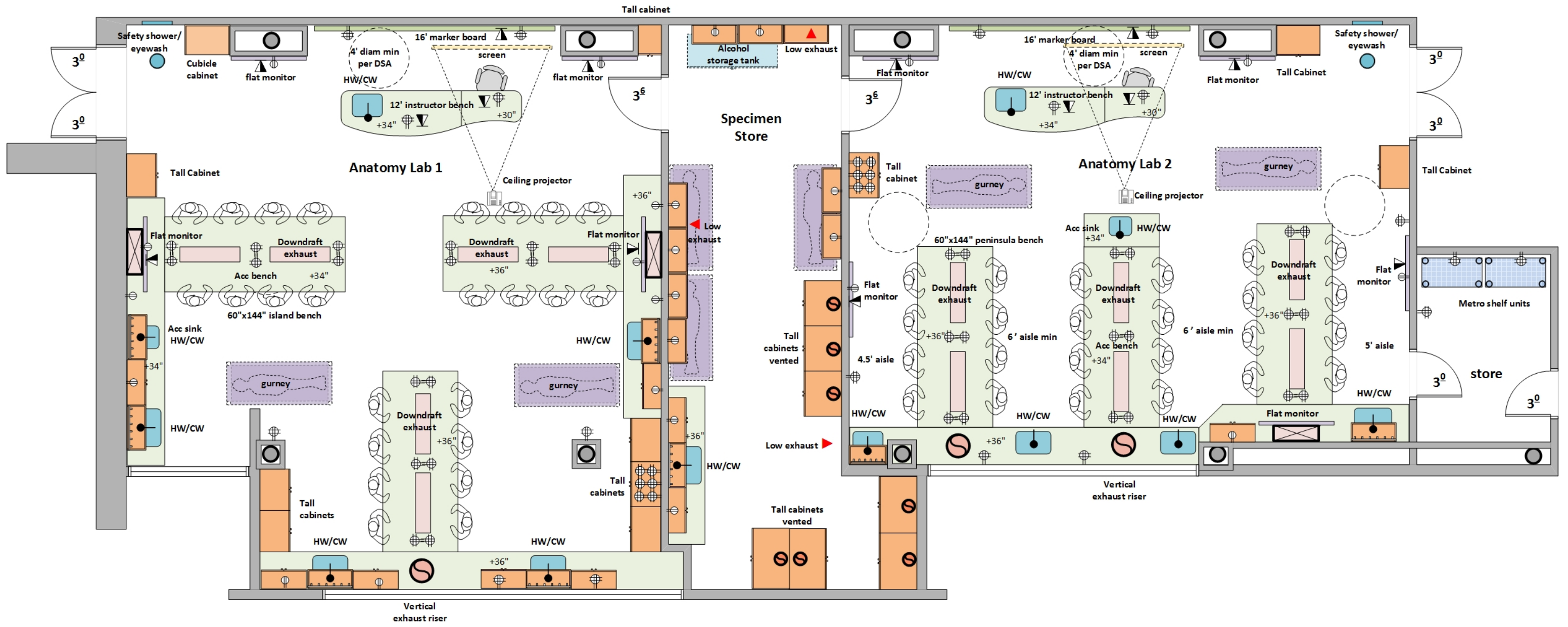
∇

Data
Number and type of ports to be determined by CSUSB

ANATOMY LABS

Rooms 141, 142, 143

Fixed Peninsula Scheme



ANATOMY LABS

Program Requirements

ARCHITECTURAL

Occupancy: B
 Number of Students: 24;
 Increase to 30 by locating students at ends of islands
 Area: Anatomy Lab #1- ~1,200 sf; Anatomy Lab #2- ~1,070 sf; Specimen Store- ~460 sf
 Floor: sealed concrete similar to existing floor
 Walls: gypsum board and enamel paint
 Ceiling: 10' acoustic tile- higher if possible to allow for suspended display of anatomy models
 Doors: 3'0"x7'0" pair at lab entries; 3'6"x7'0" with window at Specimen Store
 Acoustic Attenuation: NC 45 or less
 Security: per campus standards

STRUCTURAL

Vibration attenuation: existing structure to remain

MECHANICAL

Hours of operation: 6 am to 10 pm
 Temperature: 72 deg. F, +/- 2 deg. F
 100% exhaust- no recirculation of air
 Minimum 15 air changes per hour occupied for Anatomy Labs 1 & 2
 (half at ceiling, half at benchtop downdraft exhaust)
 6 air changes per hour unoccupied
 Minimum 25 air changes per hour occupied for Specimen Store
 (half at ceiling, half at low perimeter exhaust)
 12 air changes per hour unoccupied
 Pressure: Negative
 Humidity: Ambient
 Equipment Heat Gain: 25 btuh/sf

ELECTRICAL

110v fourplex and duplex outlets (maximum of four duplex per circuit)
 Dedicated circuits at equipment space
 Data & Wireless data
 Lighting: indirect LED @ 650 LUX
 Provide light switches at doors

PLUMBING

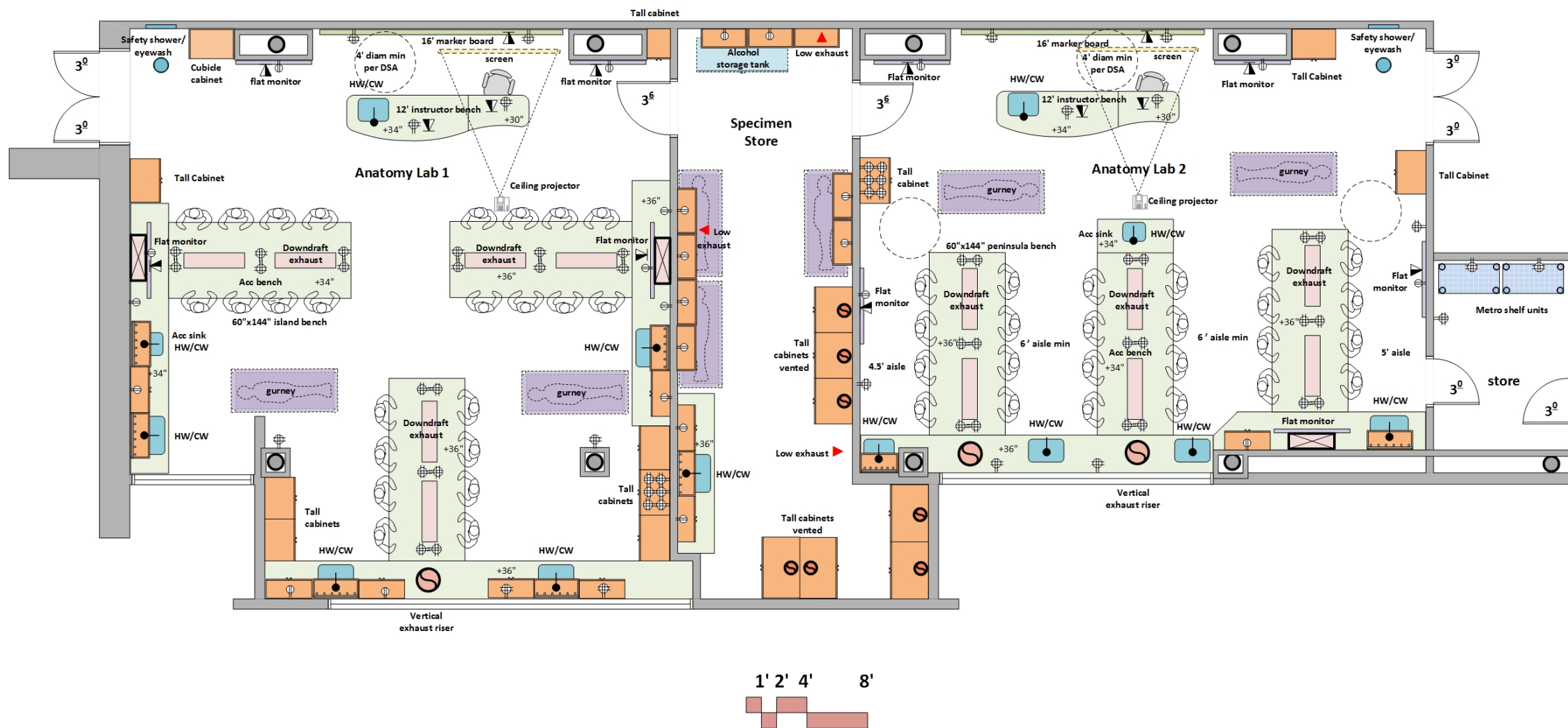
Hot/Cold water (HW/CW) at sinks with vacuum breakers
 Domestic tepid water and drain at safety shower/eyewash
 Floor drain at safety shower

CONTRACTOR FURNISHED EQUIPMENT

Laboratory casework- wall cabinets, base cabinets, tall cabinets
 Epoxy resin tops and sinks; Faucets & fittings
 Marker boards; monitors
 Safety shower/eyewash
 Fire Extinguisher

OWNER FURNISHED EQUIPMENT

Chairs; Charts
 Benchtop analytical instruments
 Scientific equipment; Gurneys

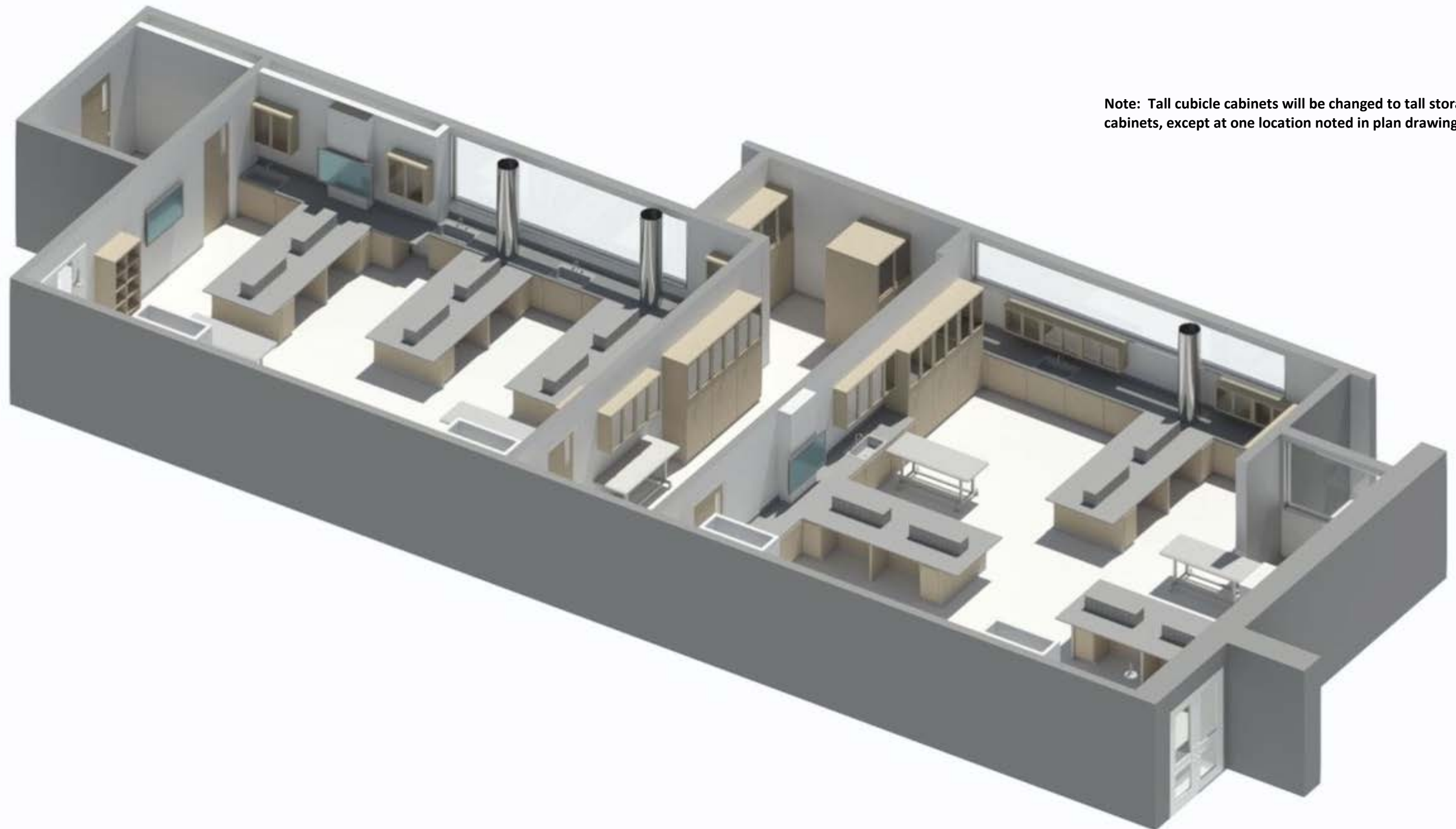


ANATOMY LAB AXONOMETRIC A

Note: Tall cubicle cabinets will be changed to tall storage cabinets, except at one location noted in plan drawing.



ANATOMY LAB AXONOMETRIC B



Note: Tall cubicle cabinets will be changed to tall storage cabinets, except at one location noted in plan drawing.

PHOTO OF SIMILAR ANATOMY LAB



Anatomy Teaching Lab
Chaffey College Health Science Building
Downdraft island workstations
5 groups of 4 students each for a total of 20 students

**PHOTO OF SIMILAR ANATOMY LAB
(continued)**



Tall Storage Cabinet

**PHOTO OF SIMILAR ANATOMY LAB
(continued)**



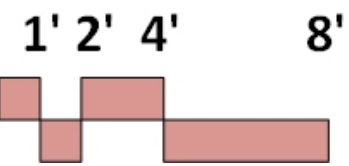
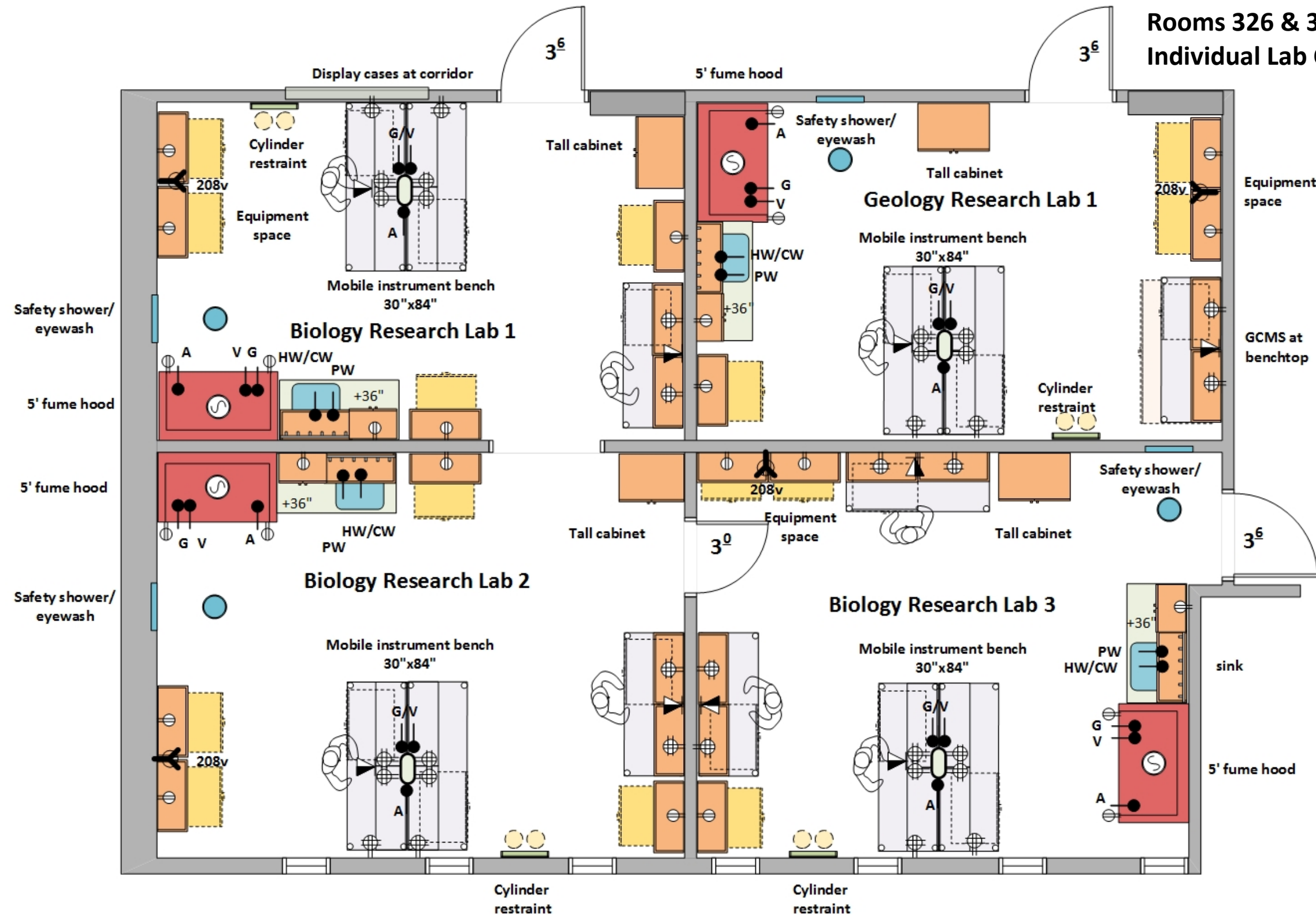
Tall Storage Cabinet- vented

**PHOTO OF SIMILAR ANATOMY LAB
(continued)**

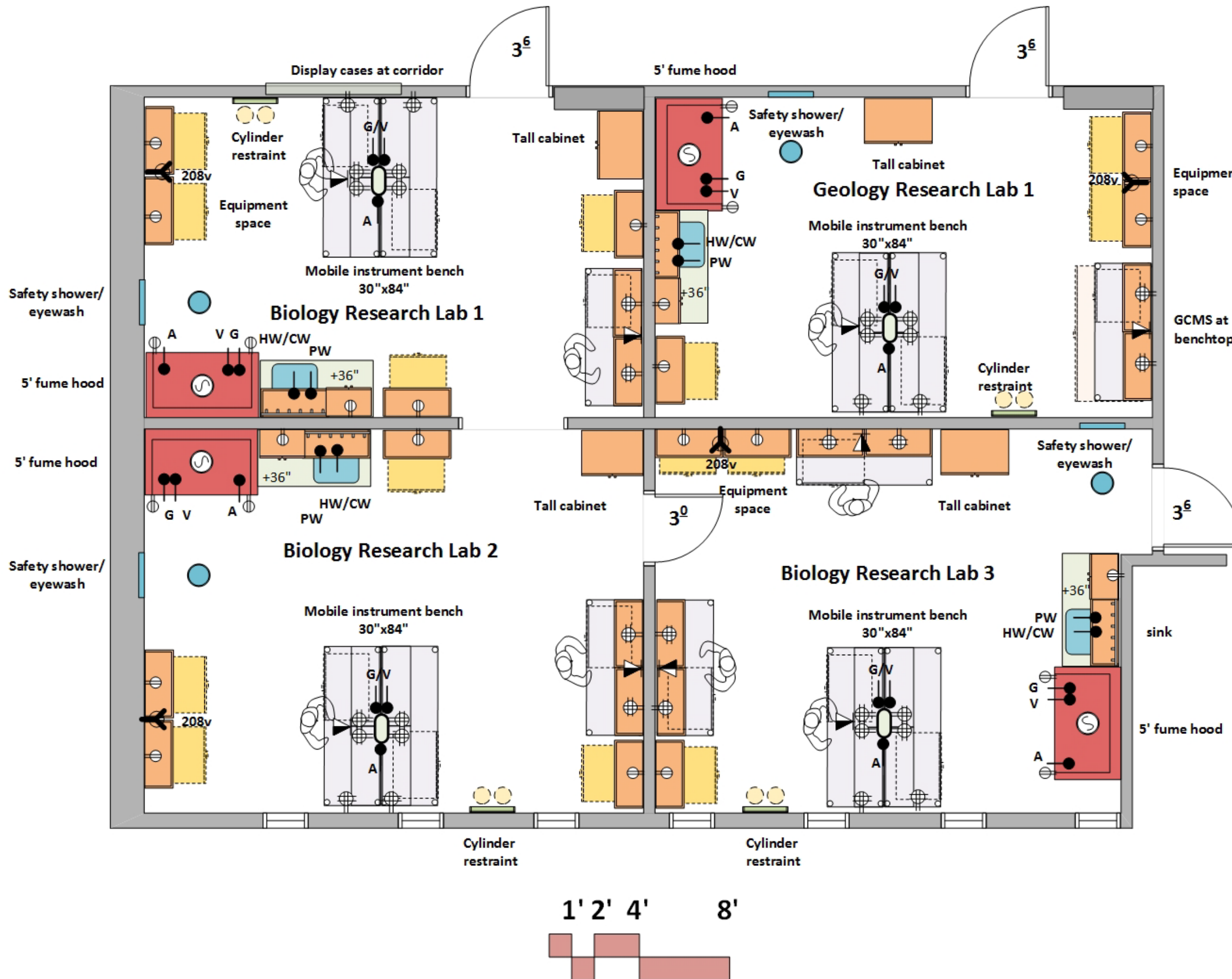


Microscope cabinet

BIOLOGY & GEOLOGY LABS- Rooms 326 & 328 Individual Lab Concept



BIOLOGY & GEOLOGY LABS- Program Requirements



ARCHITECTURAL

Occupancy: B
 Area: Bio Lab #1- ~320 sf; Bio Lab #2- ~350 sf; Bio Lab #3- ~340 sf; Geo Lab #1- ~320 sf
 Floor: sealed concrete to match existing flooring
 Walls: gypsum board and enamel paint
 Ceiling: 10' acoustic tile
 Doors: 3'x8' with window
 Acoustic Attenuation: NC 45 or less
 Security: card reader access

STRUCTURAL

Vibration attenuation: Existing structure to remain

MECHANICAL

Hours of operation: 6 am to 10 pm
 Temperature: 72 deg. F, +/- 2 deg. F
 100% exhaust- no recirculation of air
 Minimum 6 air changes per hour occupied; 4 air changes per hour unoccupied
 Pressure: Negative
 Humidity: Ambient
 Equipment Heat Gain: 25 btuh/sf

ELECTRICAL

110v fourplex and duplex outlets (maximum of four duplex per circuit)
 Standby power and dedicated circuits at equipment space
 208v 20 amp 1 phase outlets at equipment space
 Data & Wireless data
 Lighting: indirect LED @ 650 LUX
 Provide light switches at doors

PLUMBING

Hot/Cold water (HW/CW) at sinks with vacuum breakers
 Pure water at sinks
 Gas, vacuum, comp. air at fume hoods
 Gas, vacuum, comp. air at instrument benches
 Domestic tepid water and drain at safety shower/eyewash
 Floor drain at safety shower

CONTRACTOR FURNISHED EQUIPMENT

Laboratory casework- wall cabinets, base cabinets, tall cabinets
 Mobile lab benches and tables
 Epoxy resin tops and sinks; Faucets & fittings
 Chemical fume hoods
 Cylinder restraints
 Safety shower/eyewash
 Fire Extinguisher

OWNER FURNISHED EQUIPMENT

Chairs
 Benchtop analytical instruments
 Scientific equipment
 Refrigerators, freezers
 GCMS in Geology Research Lab 1

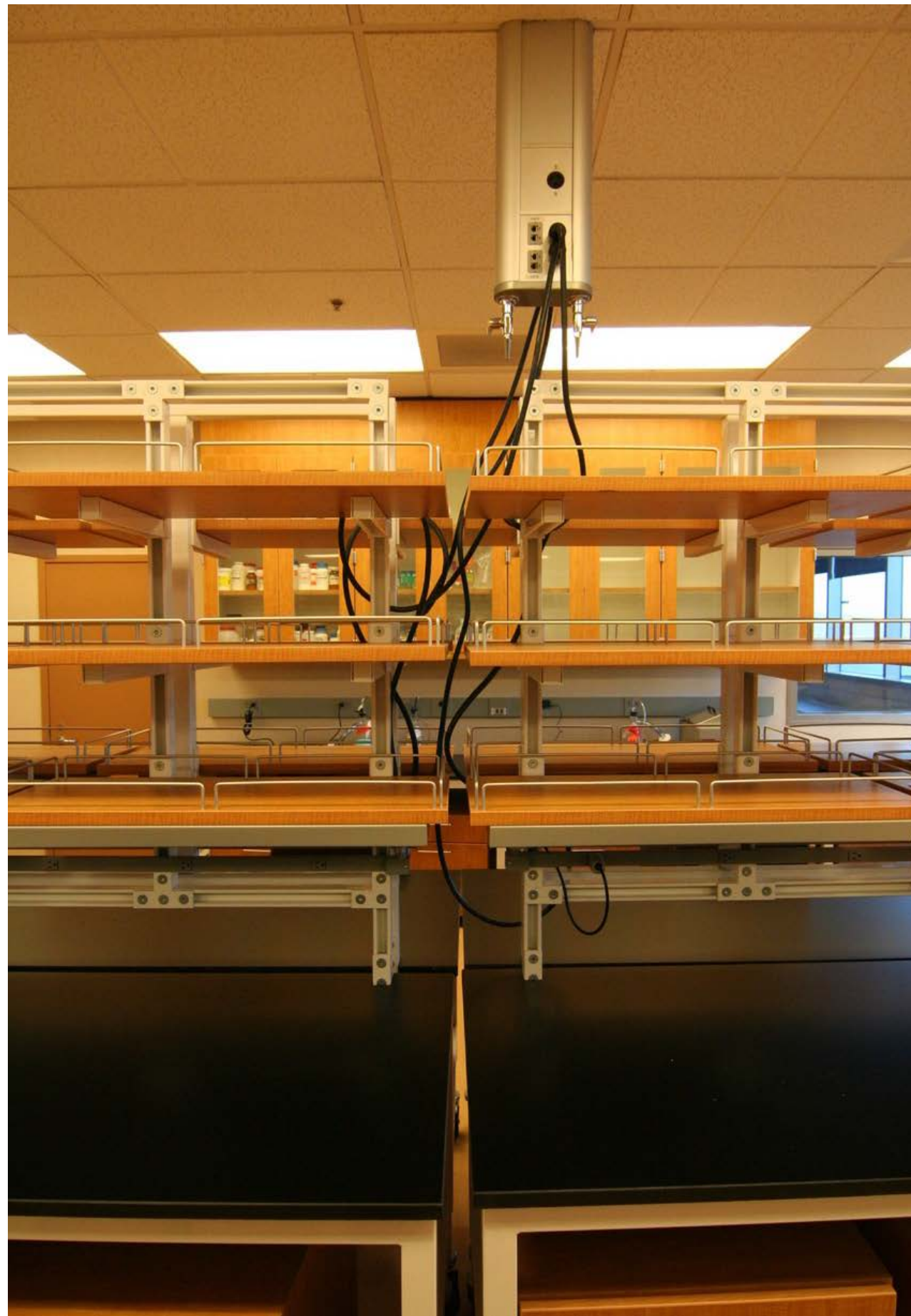
PHOTOS OF FLEXIBLE RESEARCH LABS



Life Science Research Lab at Nevada Cancer Institute

- Adjustable work surfaces
- Adjustable shelving
- Mobile lab benches
- Mobile base cabinets

PHOTOS OF FLEXIBLE RESEARCH LABS (continued)



Life Science Research Lab at Nevada Cancer Institute

- Lab benches connect to power and plumbing overhead at service column or raceway
- Overhead electrical and plumbing can be distributed with a vertical service column, as shown, or a horizontal raceway

PHOTOS OF FLEXIBLE RESEARCH LABS (continued)



**Life Science Research Lab at UC San Diego Applied Physics
Building Renovation**

- Equipment space
- 3 rows shelving at lab tables at wall
- 2 rows shelving at equipment space

PHOTOS OF FLEXIBLE RESEARCH LABS (continued)



School of Pharmacy Research Lab at Chapman University
(Renovation)-

- Mobile/adjustable instrument bench
- Equipment space at wall
- All elements are adjustable/moveable/adaptable

PHOTOS OF FLEXIBLE RESEARCH LABS (continued)



**Life Science Research Lab Procedure Room
at UC San Diego Applied Physics Building Renovation-**

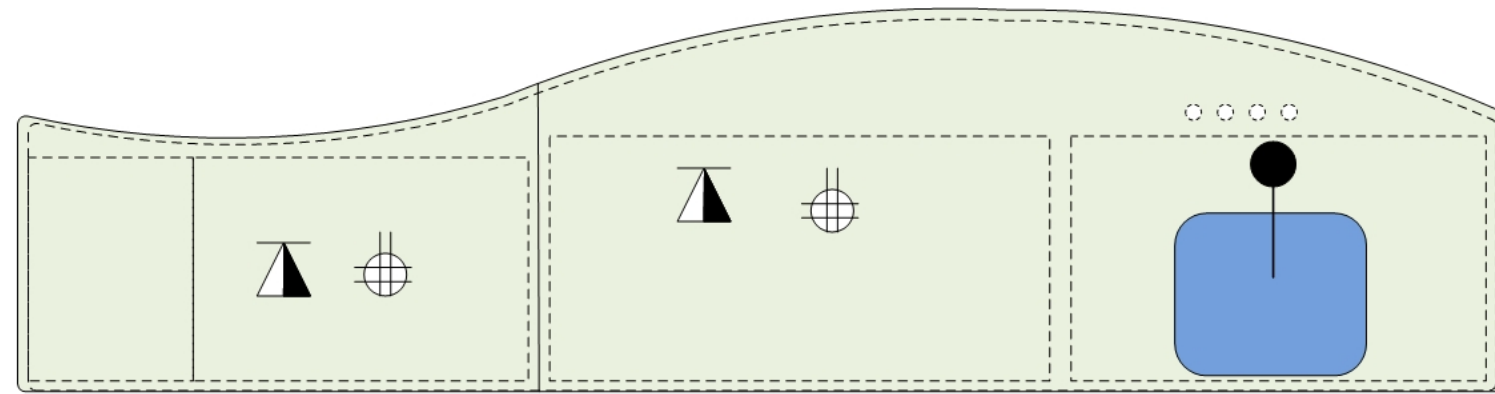
- Sink work station is the only fixed element in the lab design, other than fume hoods

SECTION DETAILS

SECTION DETAIL 01

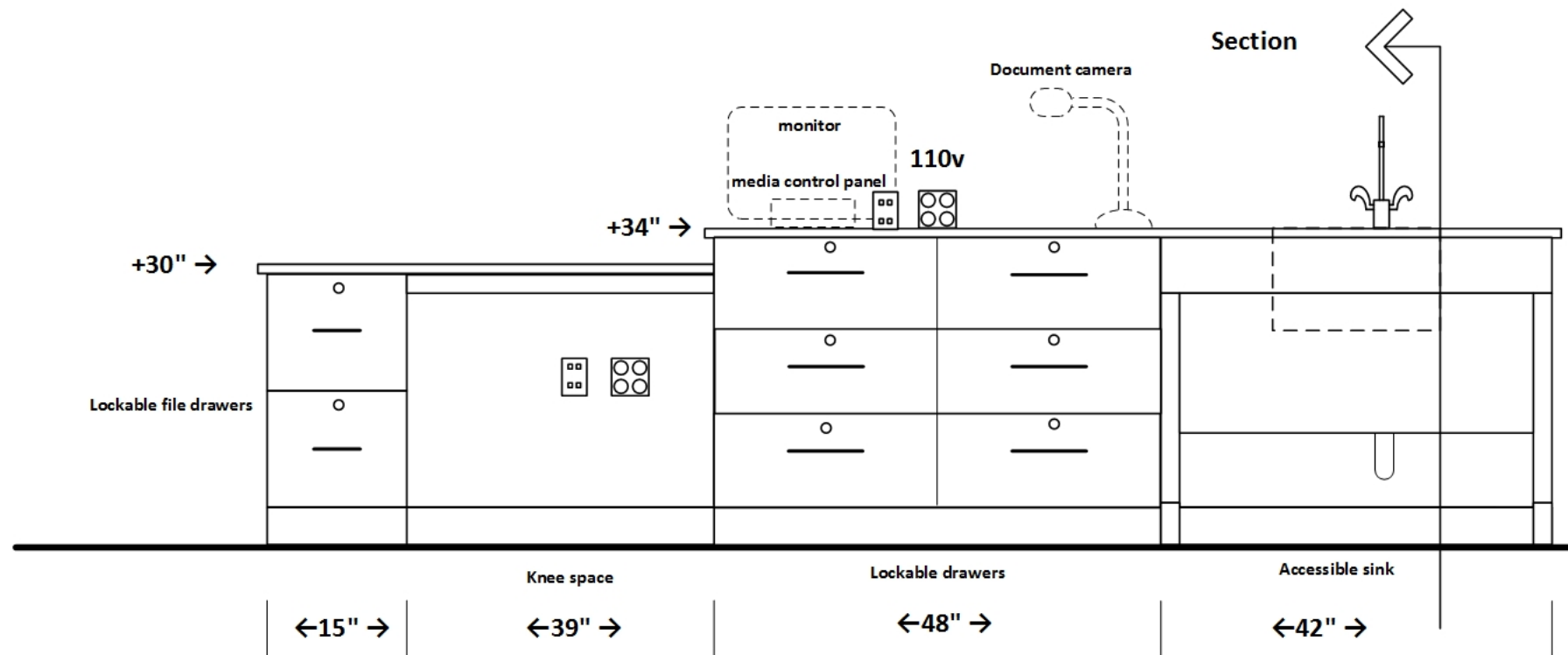
Instructor Island

Anatomy Labs

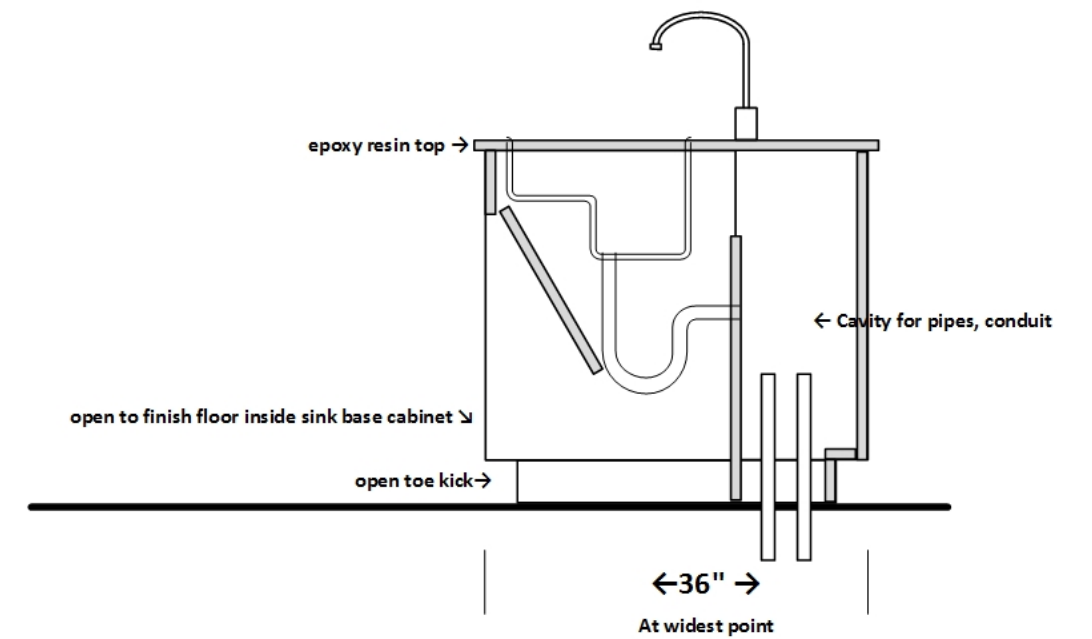
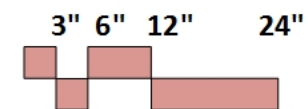


Plan

HW/CW

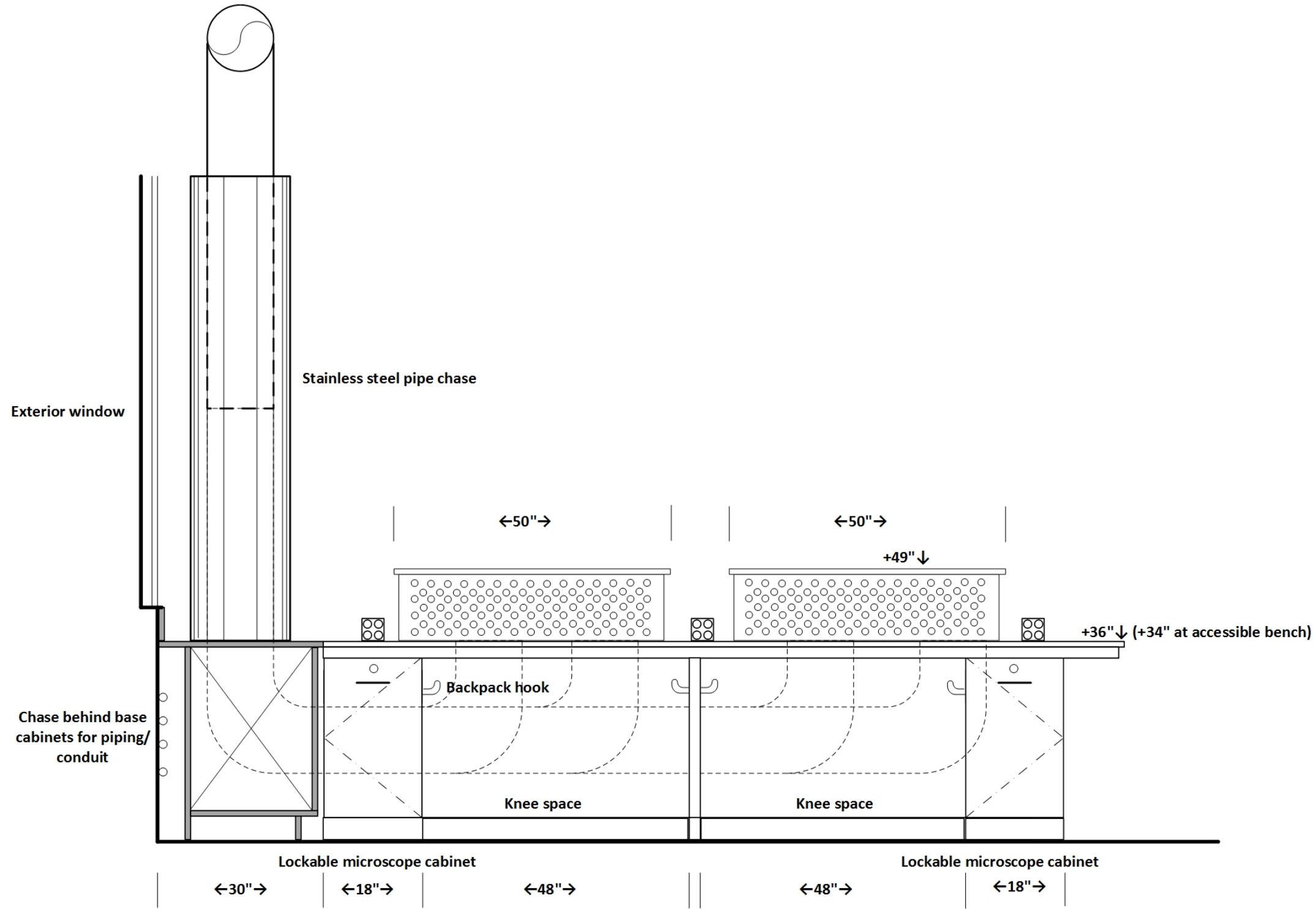


Elevation

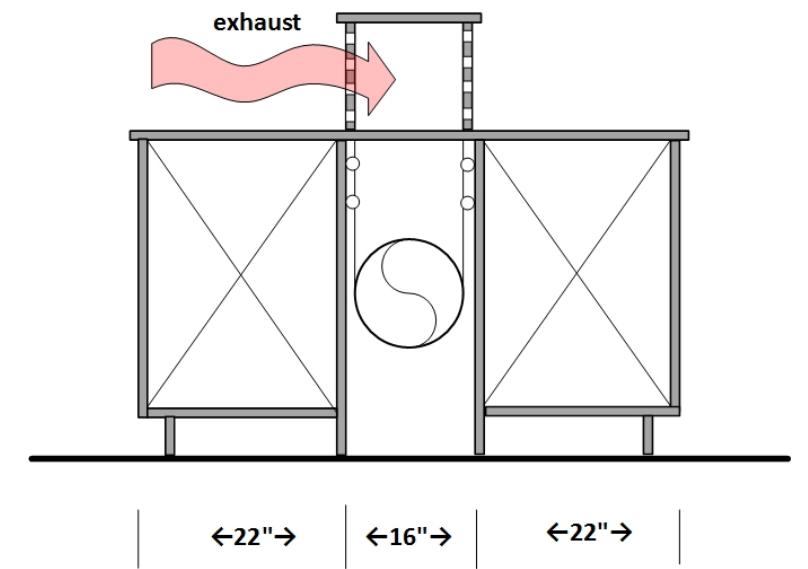


Section

SECTION DETAIL 02
Peninsula Bench
Anatomy Labs

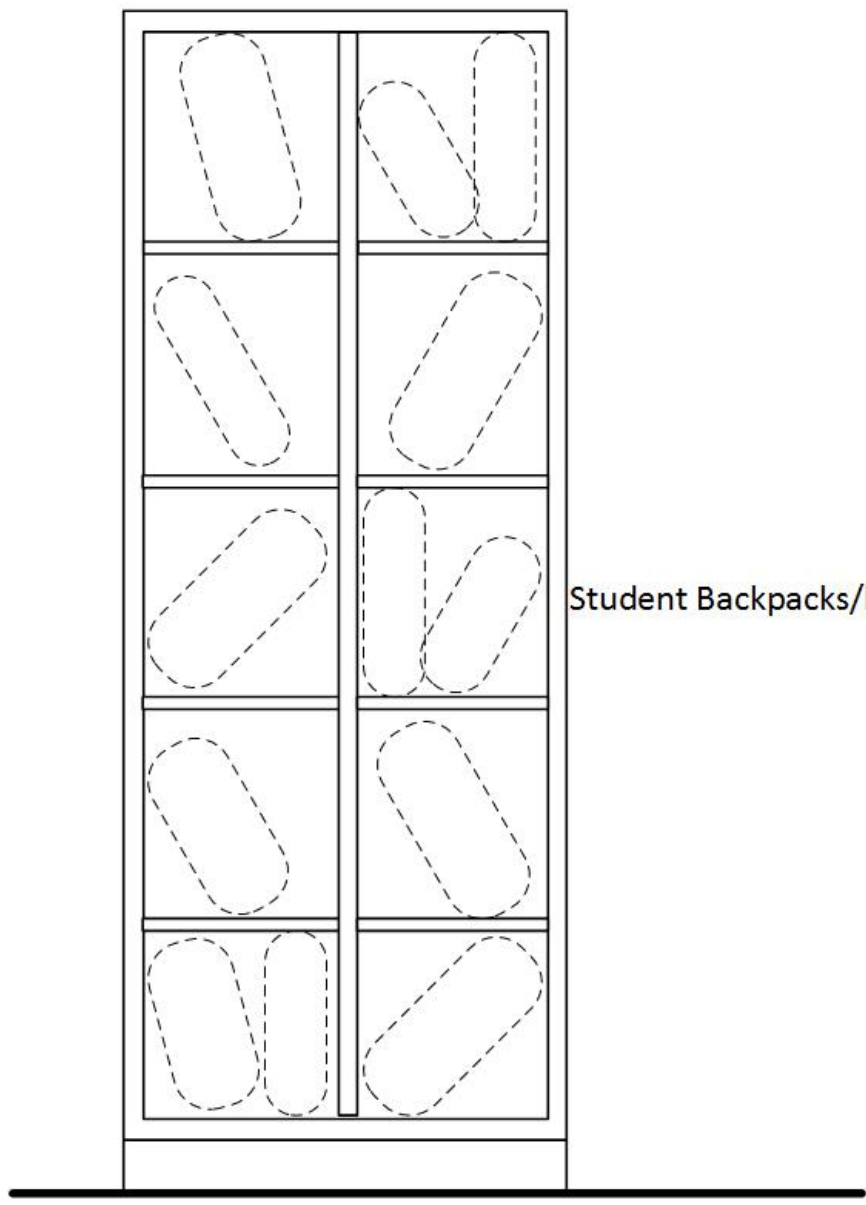


Elevation



Section

SECTION DETAIL 03
Cubicle Cabinet
Anatomy Labs

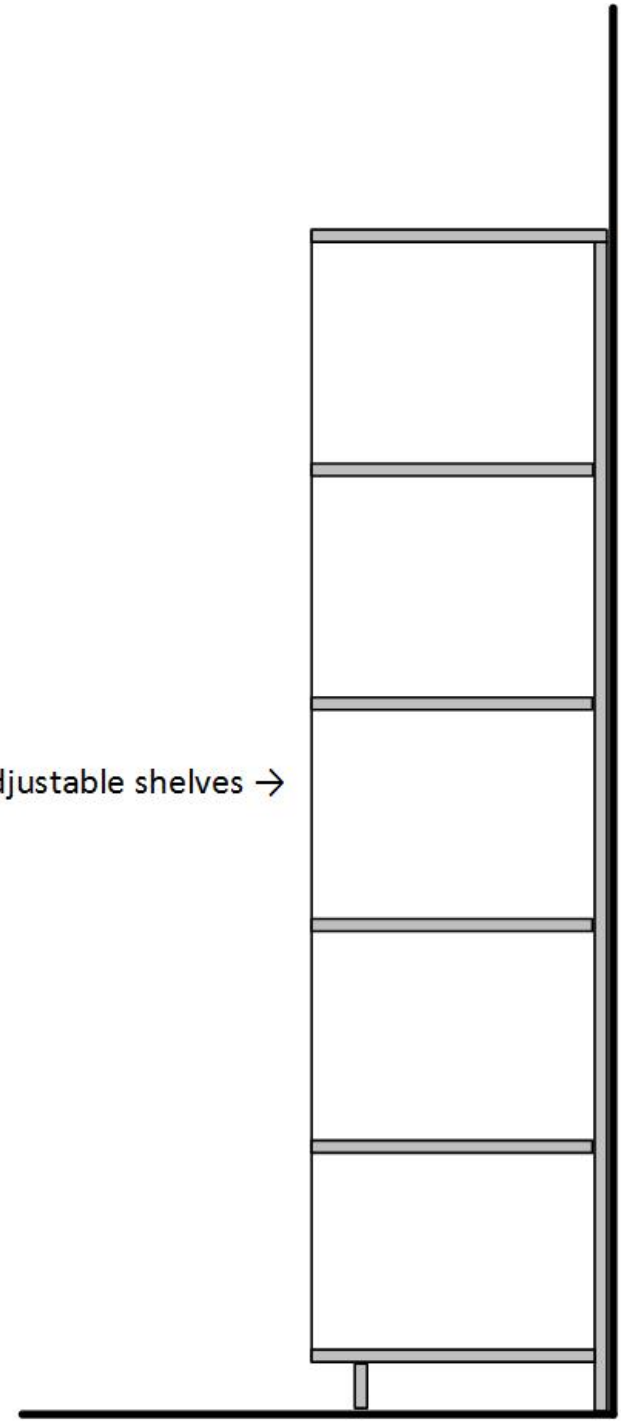


Student Backpacks/bags

←36" →

Elevation

(4) adjustable shelves →

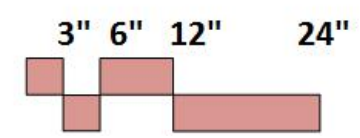


← +96" top of cabinet

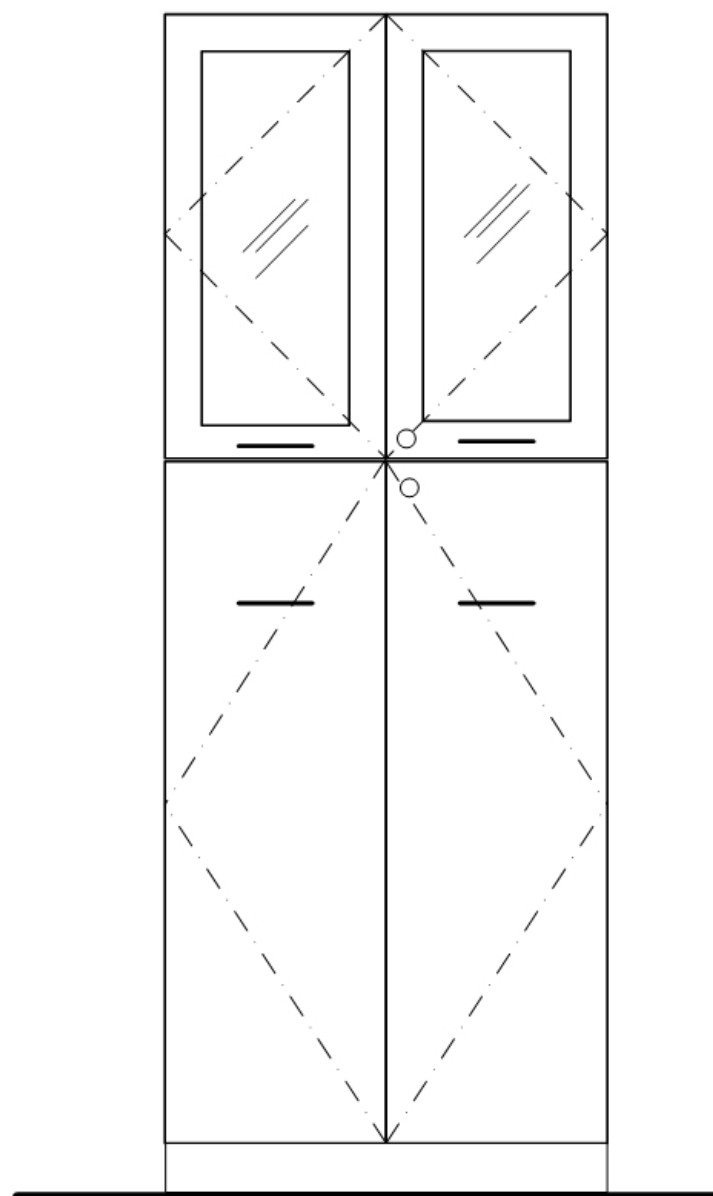
Cabinet may be used for student packs/bags or for materials storage

←24" →

Section



SECTION DETAIL 04
Tall Storage Cabinet
Anatomy Labs
Bio/Geo Labs



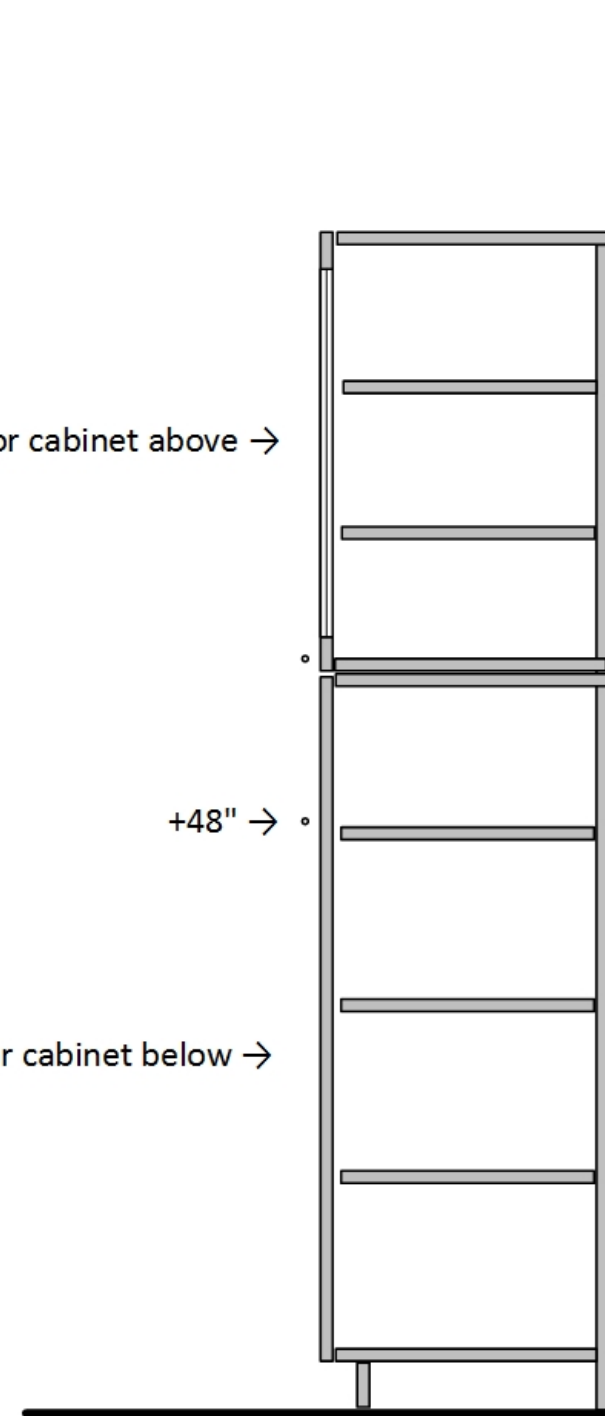
←36" →
 (width varies)

Elevation

glass door cabinet above →

solid door cabinet below →

+48" →



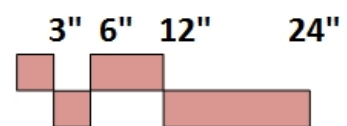
← +96" top of cabinet

← adjustable shelves

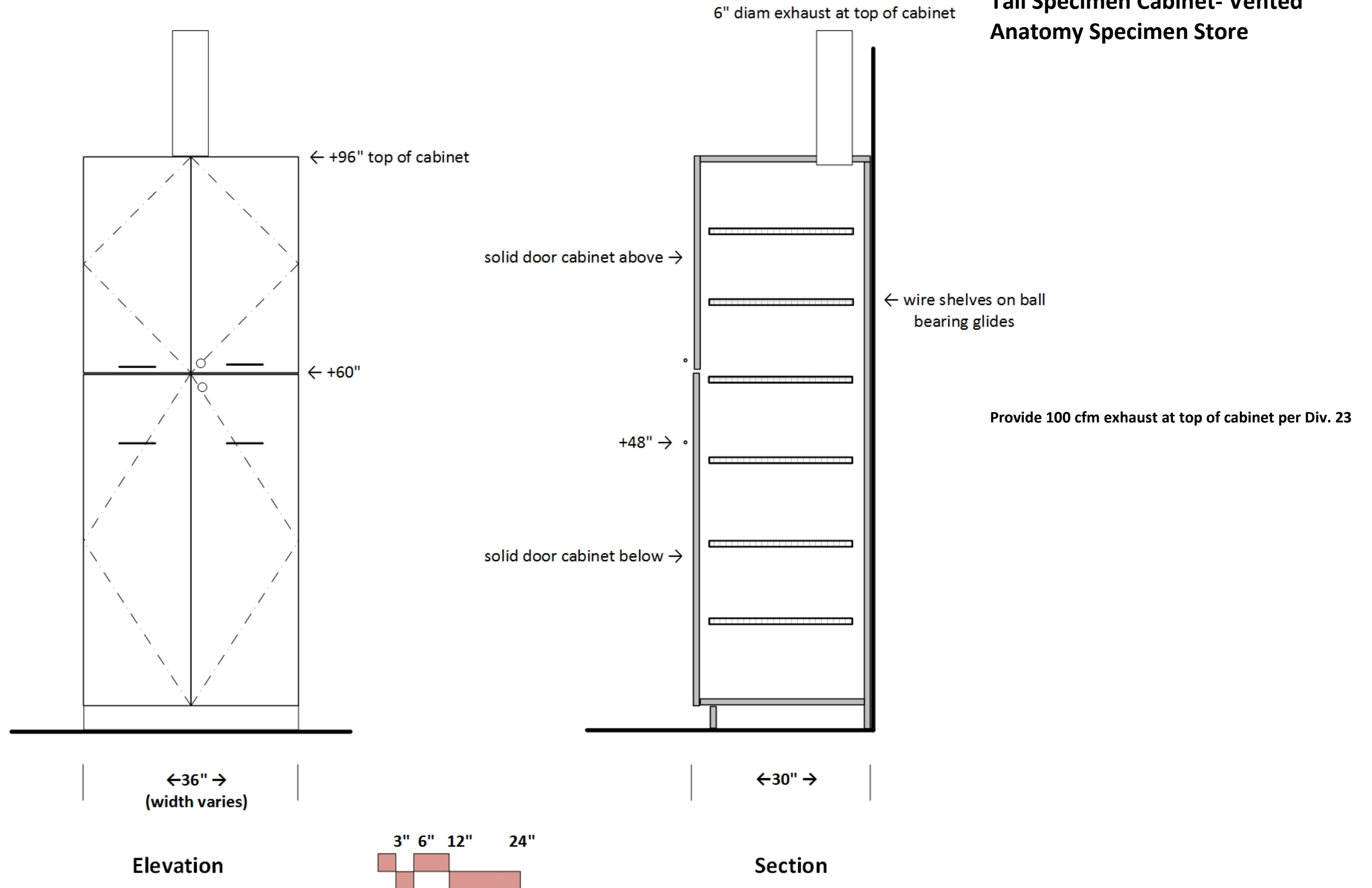
← +60"

←24" →

Section



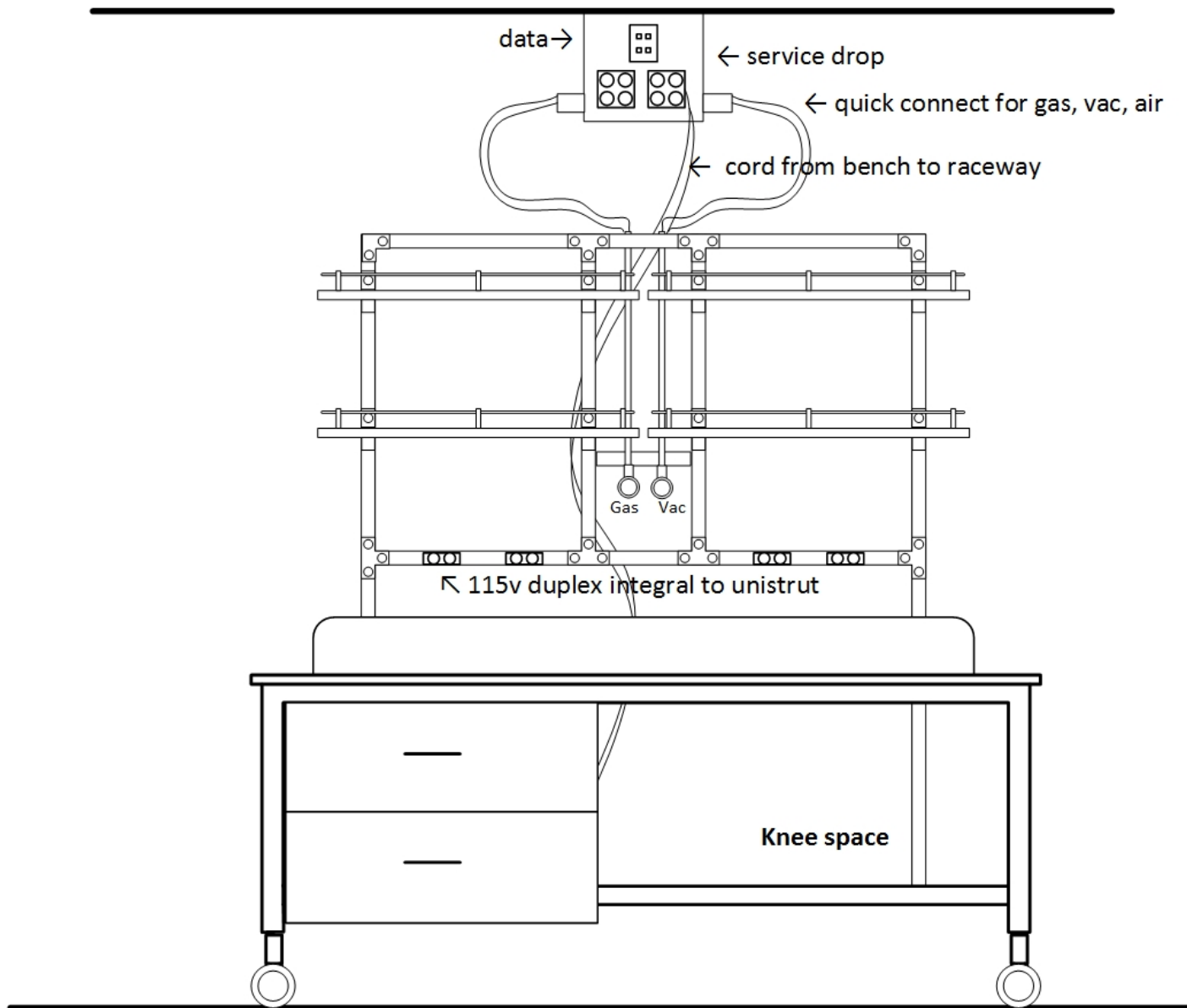
SECTION DETAIL 05
Tall Specimen Cabinet- Vented
Anatomy Specimen Store



SECTION DETAIL 07

Mobile Peninsula Bench

Bio/Geo Labs

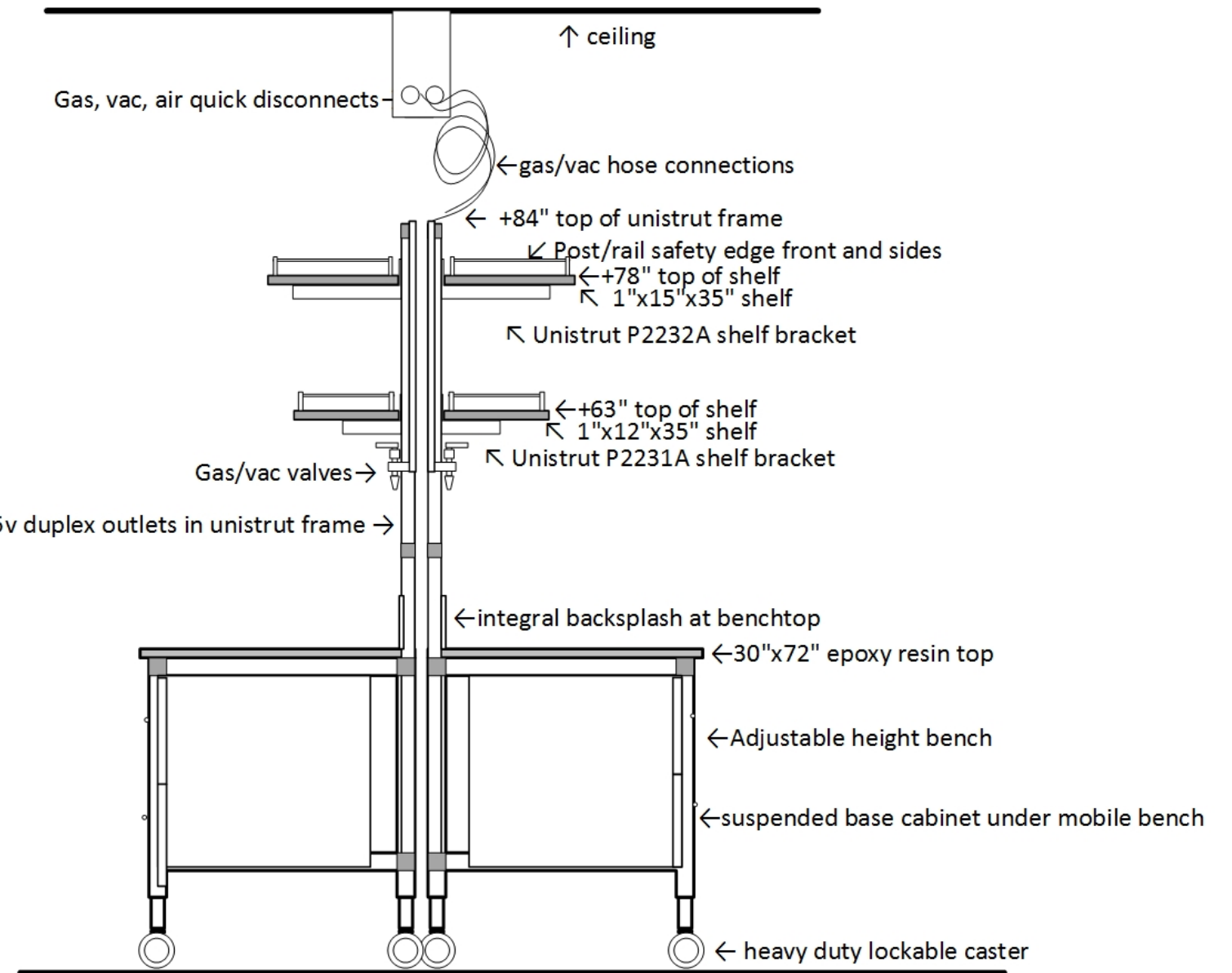
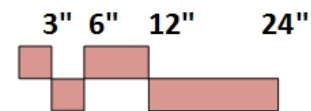


←33" →

←45" →

←84" →

Elevation

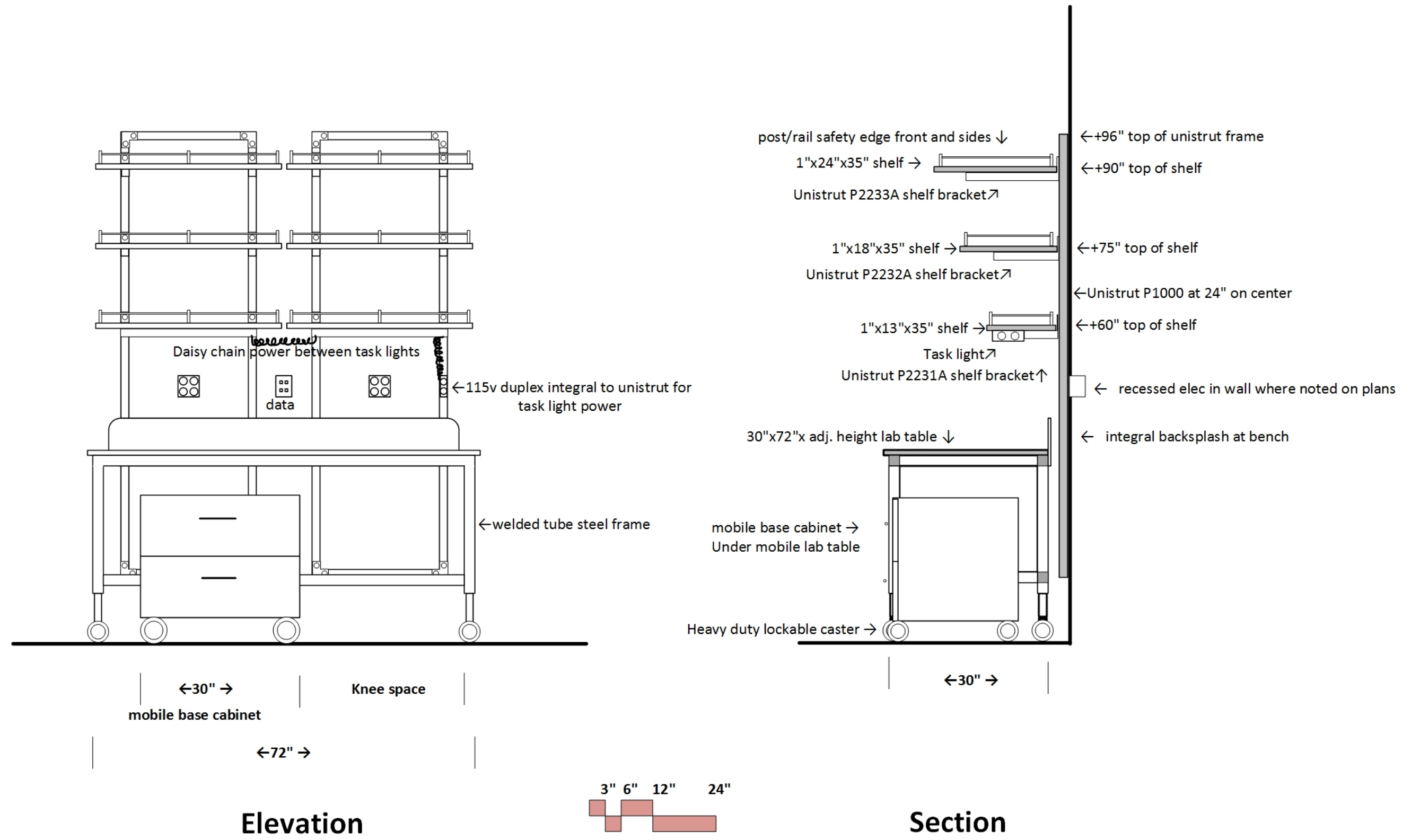


Section

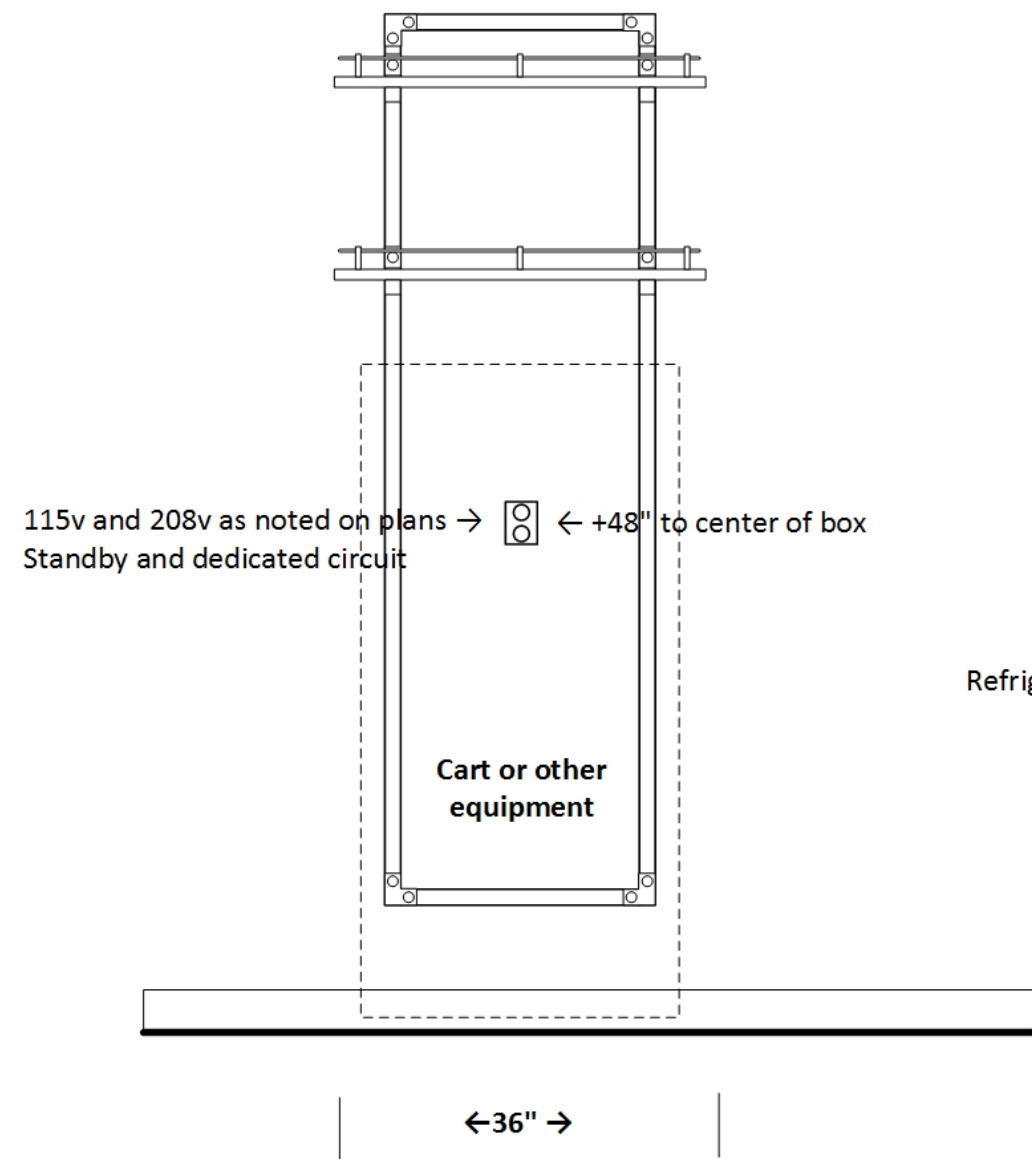
SECTION DETAIL 08

Mobile Bench at wall

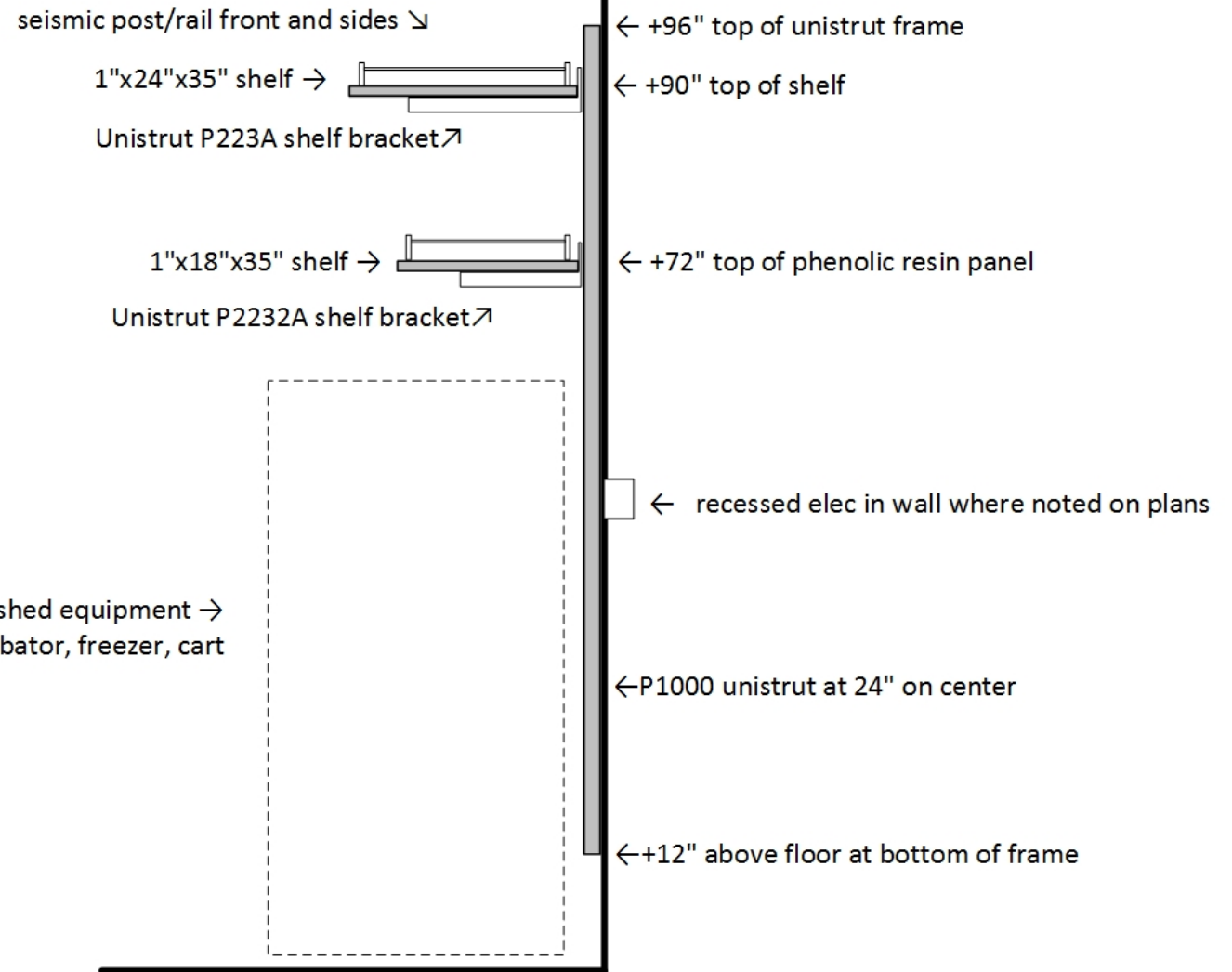
Bio/Geo Labs



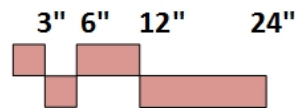
SECTION DETAIL 09
Equipment Space
Bio/Geo Labs
Anatomy Specimen Store



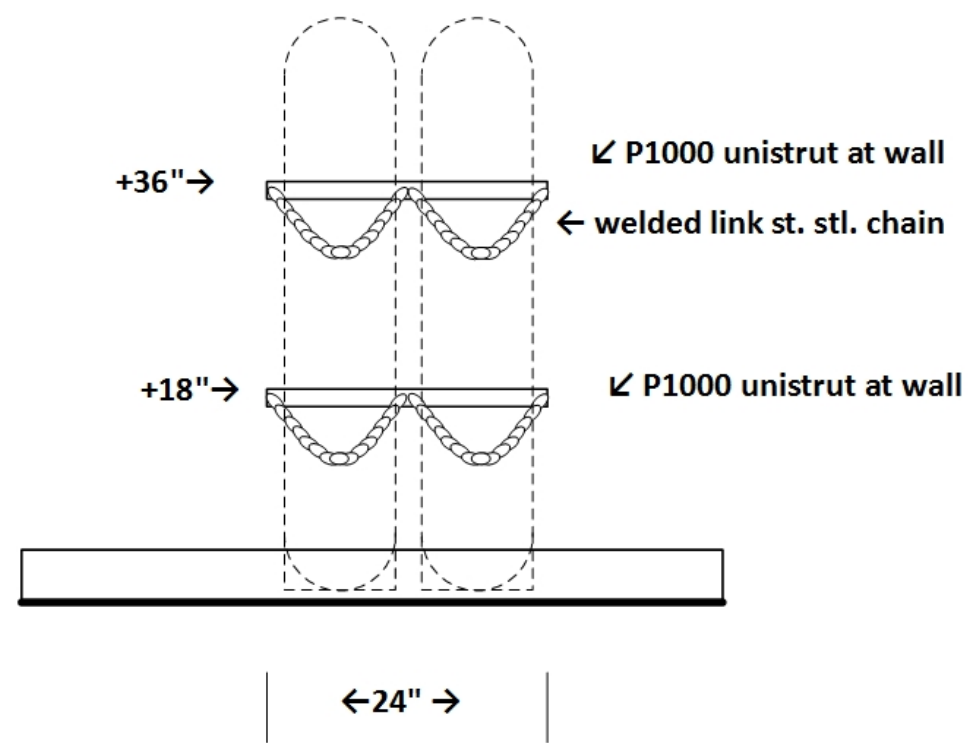
Elevation



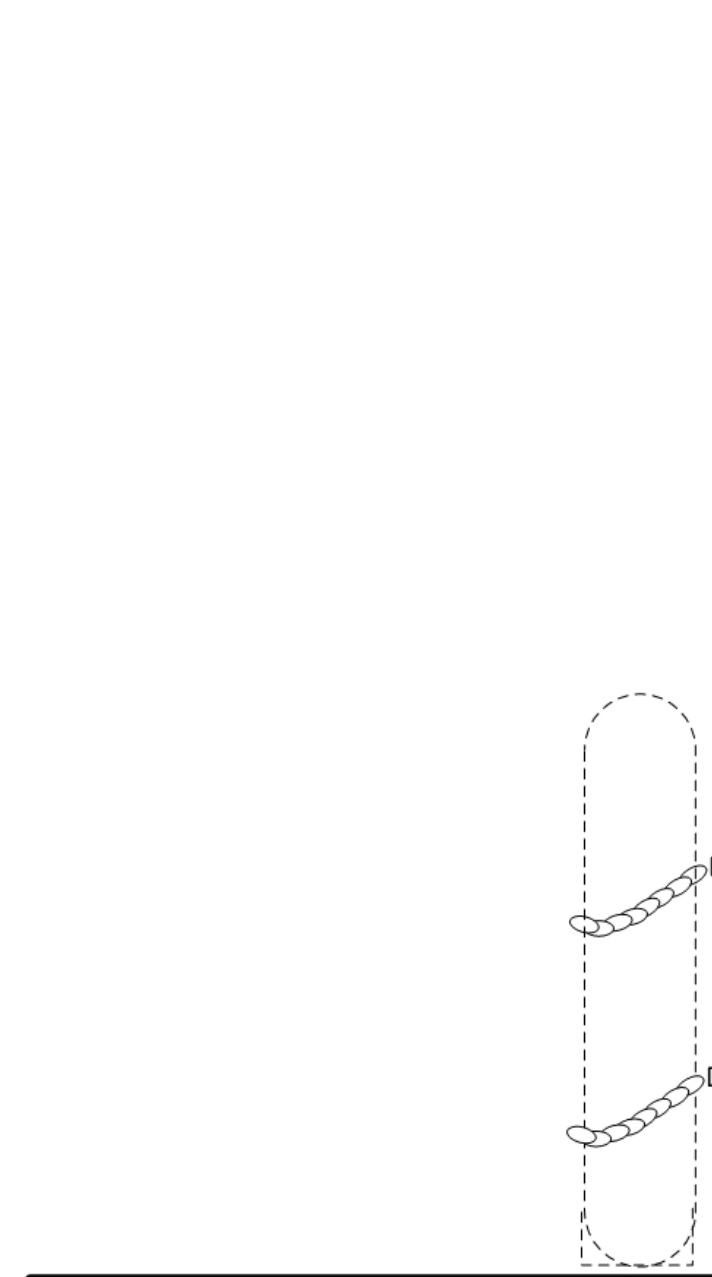
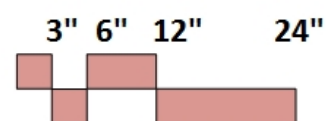
Section



SECTION DETAIL 10
Cylinder Restraint
Bio/Geo Labs



Elevation



Section

EQUIPMENT CUT SHEETS

Protector® XStream™ Laboratory Hoods



Protector XStream Laboratory Hood 9840600 is shown with SpillStopper Work Surface 9849800, Protector Acid Storage Cabinet 9901100 and Protector Standard Storage Cabinet 9900100. Blower, ductwork, work surface and base cabinets must be ordered separately.

All models feature:

- Modified by-pass airflow design.
- Ergonomic air foil with aerodynamic Clean-Sweep* airflow openings.
- Upper Dilution Air Supply.*
- Glacier white, dry powder epoxy-coated steel exterior.
- Chemical-resistant, fiberglass-reinforced, composite panel liner and pre-set Rear Downflow Dual Baffle System* with flame spread less than 25 per ASTM E-84
- 3/16" thick tempered safety glass vertical-rising sash with epoxy-coated aluminum sash handle with large radius and perforations.*

- Removable front and side panels and front and interior service access panels for access to plumbing and electrical wiring.
- Pre-wired T8 fluorescent lighting, ADA-compliant light and blower switches for 115 volt, 60 Hz operation.
- Sash stop located at 18" sash opening position.
- Epoxy-coated stainless steel, 12.81" ID exhaust connection(s).

Contact Labconco at **800-821-5525** or **816-333-8811** for ordering information on explosion-proof lighting and other sash configurations and for blower sizing assistance.

All models conform to the following regulations and standards:

- SEFA 1-2002
- NFPA 45-2000
- ASTM E84-01
- ASHRAE 110-95
- ANSI Z9.5-1993
- UL 3101-1/61010-1
- CAN/CSA C22.2 No. 1010.1
- UL 1805
- CE Conformity Marking (230 volt models)†

Fixture models feature:

- Two pre-plumbed service fixtures with forged brass valves, lower right side with brass tubing for gas and lower left side with copper tubing for cold water. Components for converting either or both fixtures to air and vacuum are provided. **Inlet tubing is not provided.**
- One pre-wired 115 volt, 20 amp electrical duplex receptacle on lower right side.

All models require (not included):

- **Remote Blower.** See back pocket.
- **Ductwork.** See back pocket.
- **Work Surface.** See pages 92-95.
- **Base Cabinet or Stand.** See pages 96-106.

Optional accessories for on-site installation include:

- **Service Fixture Kits.** See page 107.
- **Electrical Duplex Kits.** See page 108.
- **Guardian Jr. and Digital Airflow Monitor Kits.** See page 108.
- **Distillation Grid Kits.** See page 110.
- **Sash Stop Kits.** See page 108.
- **Snuffer Fire Extinguishers.** See page 110.
- **Ceiling Enclosure and Rear Finish Panel Kits.** See page 109.

* U.S. Patent No. 6,461,233

† pending

■ Heights of switches, electrical receptacle and service fixtures meet requirements of ADA.

■ Exclusive Feature

FUME HOOD CUT SHEET

Fume hood to be VAV

Ordering Information

Protector® XStream™ Laboratory Hoods

ASHRAE 110-95 tests show less than 0.05 ppm leak rate when tested at 4.0 fpm; at OSHA-approved 60, 80, and 100 fpm face velocity and sash positions of 18" and 28". To ensure performance at 60 fpm, Labconco engineers challenged the Protector XStream Hood at less

than ideal conditions such as 30 fpm cross drafts, modified ASHRAE test procedures and average face velocities lower than 60 fpm. Contact Labconco for a technical paper with complete ASHRAE test data.

Total Exhaust CFM and Static Pressure @ 18" Sash Opening (60% open)

Nominal Width	100 fpm		80 fpm		60 fpm		CFM Savings at 60 fpm vs. 100 fpm	Total Average Annual Dollar Savings at 60 fpm vs. 100 fpm*
	s.p.	s.p.	s.p.	s.p.	s.p.	s.p.		
4 feet	470	0.11"	380	0.07"	280	0.04"	190	\$760
5 feet	610	0.13"	490	0.08"	370	0.05"	240	\$960
6 feet	750	0.15"	600	0.10"	450	0.06"	300	\$1200
8 feet	1060	0.12"	850	0.08"	640	0.04"	420	\$1680

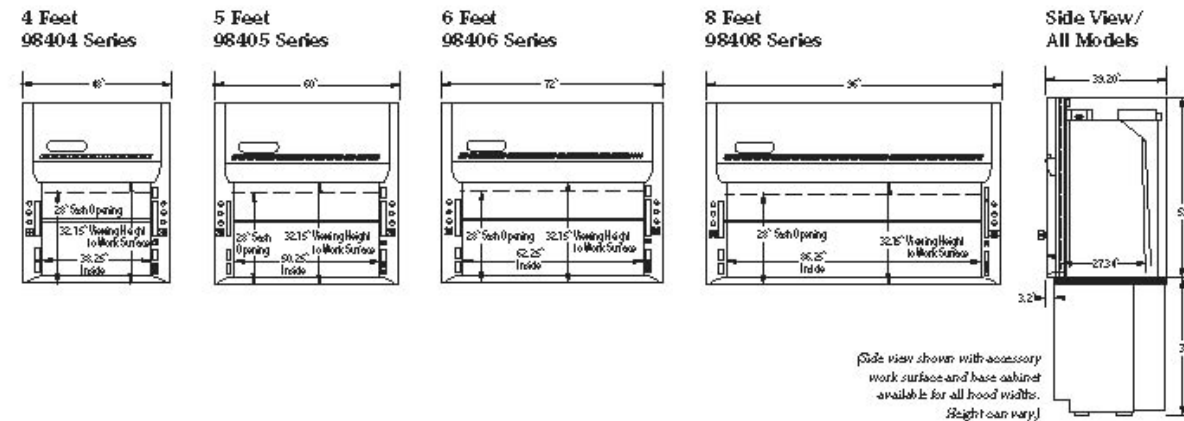
Total Exhaust CFM and Static Pressure @ 28" Sash Opening (100% open)

Nominal Width	100 fpm		80 fpm		60 fpm		CFM Savings at 60 fpm vs. 100 fpm	Total Average Annual Dollar Savings at 60 fpm vs. 100 fpm*
	s.p.	s.p.	s.p.	s.p.	s.p.	s.p.		
4 feet	730	0.25"	590	0.13"	440	0.08"	290	\$1160
5 feet	960	0.30"	770	0.19"	580	0.11"	380	\$1520
6 feet	1180	0.36"	940	0.23"	710	0.13"	470	\$1880
8 feet	1660	0.28"	1330	0.18"	1000	0.10"	660	\$2640

*Based on average annual dollars per CFM usage of \$4.00; fume hood operating 24 hours a day and 5 days per week (6240 hours per year).

Catalog Number	Nominal Width	Electrical Requirements	Exterior Depth	Interior Working Depth	Fluorescent Lamps	Service Fixtures	Electrical Duplex	Exhaust Collar(s)	Shipping Wt. lbs./kg
9840400	4 feet	115 volts, 60 Hz	39.20"	27.3"	(2) 25 watt	None	None	12.81" ID	400/181
9840401	4 feet	115 volts, 60 Hz	39.20"	27.3"	(2) 25 watt	2	1	12.81" ID	400/181
9840402**	4 feet	230 volts, 50 Hz	39.20"	27.3"	(2) 25 watt	None	None	12.81" ID	400/181
9840403**	4 feet	230 volts, 50 Hz	39.20"	27.3"	(2) 25 watt	2	None	12.81" ID	400/181
9840500	5 feet	115 volts, 60 Hz	39.20"	27.3"	(2) 32 watt	None	None	12.81" ID	460/209
9840501	5 feet	115 volts, 60 Hz	39.20"	27.3"	(2) 32 watt	2	1	12.81" ID	460/209
9840502**	5 feet	230 volts, 50 Hz	39.20"	27.3"	(2) 32 watt	None	None	12.81" ID	460/209
9840503**	5 feet	230 volts, 50 Hz	39.20"	27.3"	(2) 32 watt	2	None	12.81" ID	460/209
9840600	6 feet	115 volts, 60 Hz	39.20"	27.3"	(2) 32 watt	None	None	12.81" ID	520/236
9840601	6 feet	115 volts, 60 Hz	39.20"	27.3"	(2) 32 watt	2	1	12.81" ID	520/236
9840602**	6 feet	230 volts, 50 Hz	39.20"	27.3"	(2) 32 watt	None	None	12.81" ID	520/236
9840603**	6 feet	230 volts, 50 Hz	39.20"	27.3"	(2) 32 watt	2	None	12.81" ID	520/236
9840800	8 feet	115 volts, 60 Hz	39.20"	27.3"	(4) 25 watt	None	None	(2) 12.81" ID	700/318
9840801	8 feet	115 volts, 60 Hz	39.20"	27.3"	(4) 25 watt	2	1	(2) 12.81" ID	700/318
9840802**	8 feet	230 volts, 50 Hz	39.20"	27.3"	(4) 25 watt	None	None	(2) 12.81" ID	700/318
9840803**	8 feet	230 volts, 50 Hz	39.20"	27.3"	(4) 25 watt	2	None	(2) 12.81" ID	700/318

**International electrical configuration



Side view shown with auxiliary work surface and base cabinet behind. Slight can vary.

SSBF2150 Recessed Safety Station with Drain Pan, Exposed Shower Head

Application: Recessed barrier-free eye/face wash and shower safety station with ceiling mounted exposed shower head and drain pan. Stainless steel cover provides attractive appearance and protects unit when not in use. When activated, cover serves as pan to collect waste water and return it into unit for drainage.

ADA Compliance: When installed at recommended mounting heights, unit complies with ADA requirements for accessibility by handicapped persons.

Shower Head: 10" diameter stainless steel.

Shower Valve: 1" IPS brass stay-open ball valve with stainless steel "panic bar" actuator.

Cover/Drain Pan: 16 gauge stainless steel combination cover and drain pan. Grasping "panic bar" handle and opening cover pulls spray head assembly down from vertical to horizontal position, activating water flow. While unit is in operation, waste water is collected in drain pan and returned into cabinet for drainage. Unit remains in operation until cover is returned to closed position.

Eye/Face Wash Spray Head Assembly: Two FS-Plus™ spray heads mounted on supply arms. Each spray head has individually adjustable flow control and filter to remove impurities from water.

Eye/Face Wash Valve: 1/2" IPS brass plug-type valve with O-ring seals. Furnished with in-line strainer to protect valve from debris and foreign matter.

Mounting: 16 gauge stainless steel cabinet with flanged rim for recessed mounting in wall. Unit fits in standard 3-5/8" deep wall.

Pipe and Fittings: Exposed pipe and escutcheon are brushed stainless steel.

Supply: 1" NPT female inlet.

Waste: 2" NPT female outlet.

Sign: Furnished with ANSI-compliant identification sign.

Quality Assurance: Unit is completely assembled and water tested prior to shipment.

U.S. Patent 5,768,721

Available Options

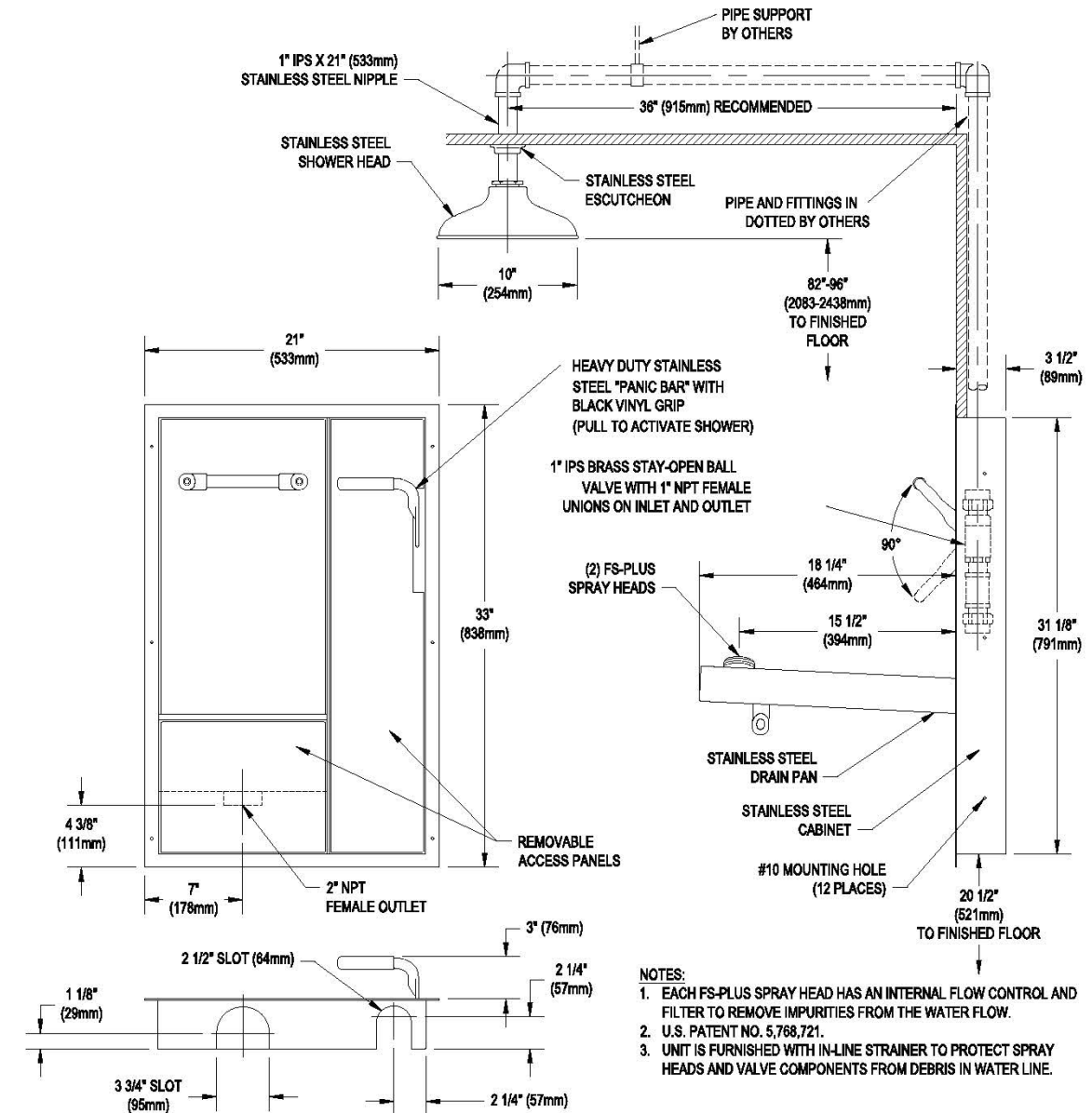
- PCC** Polished chrome plated brass shower supply nipple.
- AP250-065** Modesty Curtain
- AP280-235** Electric Light and Alarm Horn
- TMV** AP3800 thermostatic mixing valve.



Note: Shown with optional AP280-235 electric light and alarm horn unit (sold separately).



SSBF2150 Recessed Safety Station with Drain Pan, Exposed Shower Head



- NOTES:**
1. EACH FS-PLUS SPRAY HEAD HAS AN INTERNAL FLOW CONTROL AND FILTER TO REMOVE IMPURITIES FROM THE WATER FLOW.
 2. U.S. PATENT NO. 5,768,721.
 3. UNIT IS FURNISHED WITH IN-LINE STRAINER TO PROTECT SPRAY HEADS AND VALVE COMPONENTS FROM DEBRIS IN WATER LINE.

THIS SPACE FOR ARCHITECT/ENGINEER APPROVAL

Due to continuing product improvement, the information contained in this document is subject to change without notice. All dimensions are ± 1/4" (6mm). rev. 0315

Sign Included





PRODUCT DIMENSIONS

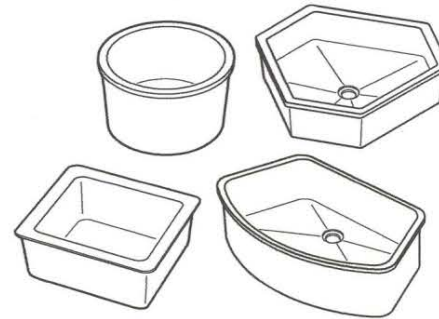
DOMESTIC SIZES

SINK CUT SHEET

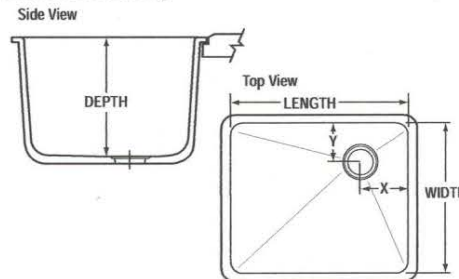
Standard DropIn® Sinks

Sink No.	Outlet	Wgt (lb)	Dimensions (in)				
			Inside Bowl			Outlet Location	
			Length	Width	Depth	X	Y
D01C	Center	9	9.0	6.0	5.8	4.5	3.0
D03C	Center	16	12.0	8.0	5.8	6.0	4.0
A05	Corner	18	14.0	10.0	5.0	3.5	3.5
D05	Corner	22	14.0	10.0	6.2	3.5	3.5
D05C	Center	24	14.0	10.0	6.2	7.0	5.0
D10	End	20	16.0	8.0	6.8	4.5	4.0
D10C	Center	22	16.0	8.0	6.8	8.0	4.0
D15	Corner	30	16.0	12.0	8.0	3.5	3.5
D15C	Center	31	16.0	12.0	8.0	8.0	6.0
D19	Corner	42	16.0	16.0	9.6	3.5	3.5
D20	Corner	32	16.0	16.0	7.5	3.5	3.5
D22C	Center	30	18.0	6.5	6.8	9.0	3.3
D24(C)	Center	30	18.0	14.0	10.5	9.0	6.8
A25	Corner	35	18.0	15.0	5.0	3.5	3.5
D25	Corner	39	18.0	15.0	7.9	3.5	3.5
D30	Corner	53	18.0	15.0	11.0	3.5	3.5
D30C	Center	50	18.0	15.0	10.8	9.0	7.5
D33E	End	59	21.0	17.0	9.8	4.5	8.5
D45	Corner	64	21.5	15.5	11.0	3.5	3.5
D50C	Center	48	24.0	16.0	8.0	12.0	8.0
D52	Corner	77	24.0	18.0	11.0	3.5	3.5
A55	Corner	47	25.0	15.0	4.8	3.5	3.5
D55	Corner	61	25.0	15.0	10.0	3.5	3.5
D59	Corner	61	28.0	15.0	11.8	3.5	3.5
DRS12	Center	18	12.0	Round	7.8	Center	

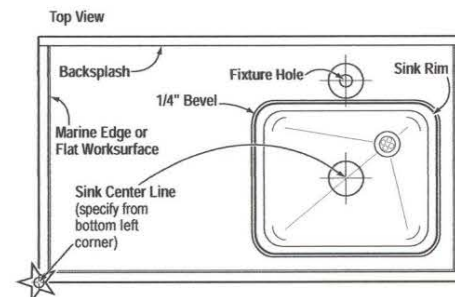
DropIn® Sink Styles



Dimensions Key



Installation Detail



Special Order DropIn® Sinks

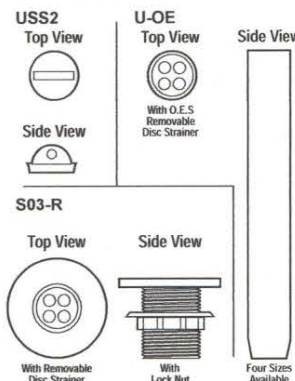
Sink No.	Outlet	Wgt (lb)	Dimensions (in)				
			Inside Bowl			Outlet Location	
			Length	Width	Depth	X	Y
D06*	Center	34	12.0	12.0	12.0	6.0	6.0
A07*	Corner	24	14.0	14.0	5.0	3.5	3.5
D08*	Corner	25	15.0	8.0	6.0	3.5	3.5
D09*	Corner	25	15.0	8.0	10.8	3.5	3.5
D21*	Corner	58	16.0	16.0	15.0	3.5	3.5
A26*	Corner	39	18.0	15.0	5/11	4.5	5.5
D32	Corner	49	18.0	15.0	15.8	3.5	3.5
D51*	Corner	60	24.0	16.0	9.6	3.5	3.5
D54*	Corner	45	25.0	15.0	8.0	3.5	3.5
D57*	Corner	71	25.0	15.0	13.6	3.5	3.5
D58*	Corner	79	25.0	15.0	17.8	3.5	3.5
D61	End	94	30.0	16.0	17.8	4.5	7.5
D65C*	Center	98	35.5	19.5	9.8	17.8	9.8
D68**	End	70	30.0	16.0	10.0	4.75	8.0
D70C*	Center	95	24.0	16.0	15.5	8.0	12.0
D100**	Center	29	22.5	Hexagon	5.0	Center	
D200**	End	64	30.9	Hexagon	7.0	15.5	8.0
DRS10*	Center	14	10.0	Round	7.8	Center	
DHC20*	End	82	30.0	Hexagon	7.0	Center	
D99*	End	56	32.0	Semi-Circle	10.0	11.5	4.5

All sinks are available at both plants unless they are Special Order Sinks, available as noted:
 * Available only from Taylor, TX, plant (colors: Black Onyx, Gray, Graphite, Tan, Forest Green and Steel Blue).
 ** Available only from Canton, MI, plant (colors: Black Onyx, Gray and Alpine White)

ADA compliant sinks are designated by this symbol.

All Dimensions are nominal. Exterior dimensions vary by MFG location. Cutsheets available upon request.

Outlets & Accessories



Accessible Sinks:

A26: 18" L x 15" W x 5/11" D

Anatomy Sinks:

D61: 30" L x 16" W x 17.8" D

Biology/Geology Sinks:

D59: 28" L x 15" W x 11.8" D

WWW.DURCON.COM

206 Allison Drive • Taylor, TX 76574 • Phone: 512.595.8000 • Fax: 512.595.8400 • E-mail: sales@durcon.com

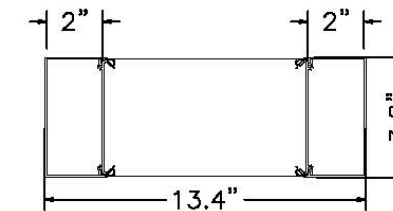
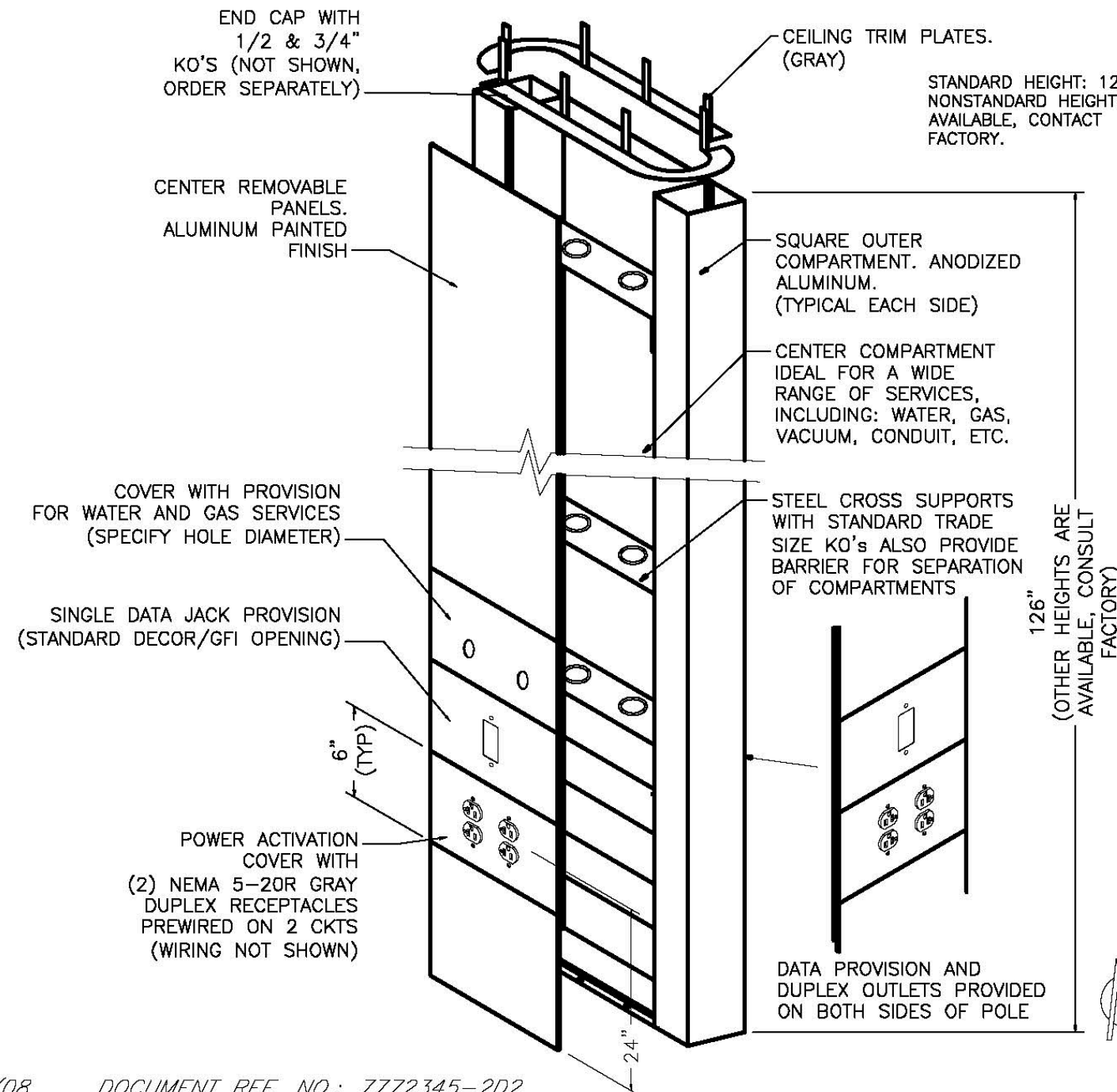
© Copyright Durcon Incorporated™ All rights reserved.

Rev: 02/08

Mono-Systems, Inc.
Mono-View
Architectural Chase System

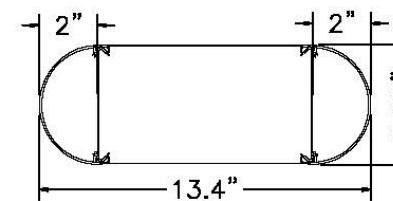
HIGH CAPACITY AESTHETIC POLE SYSTEM (MONO-VIEW)

CATALOG #: VPL-7772345-2D2*



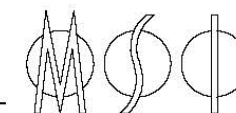
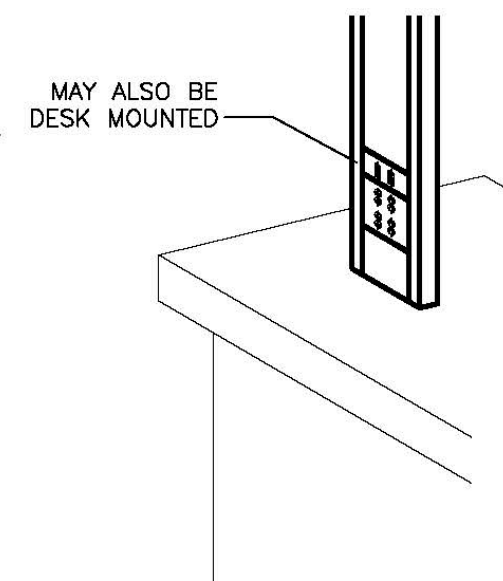
SECTION (SQUARE COMPARTMENTS)

P/N: VPL-7772345-2D2S



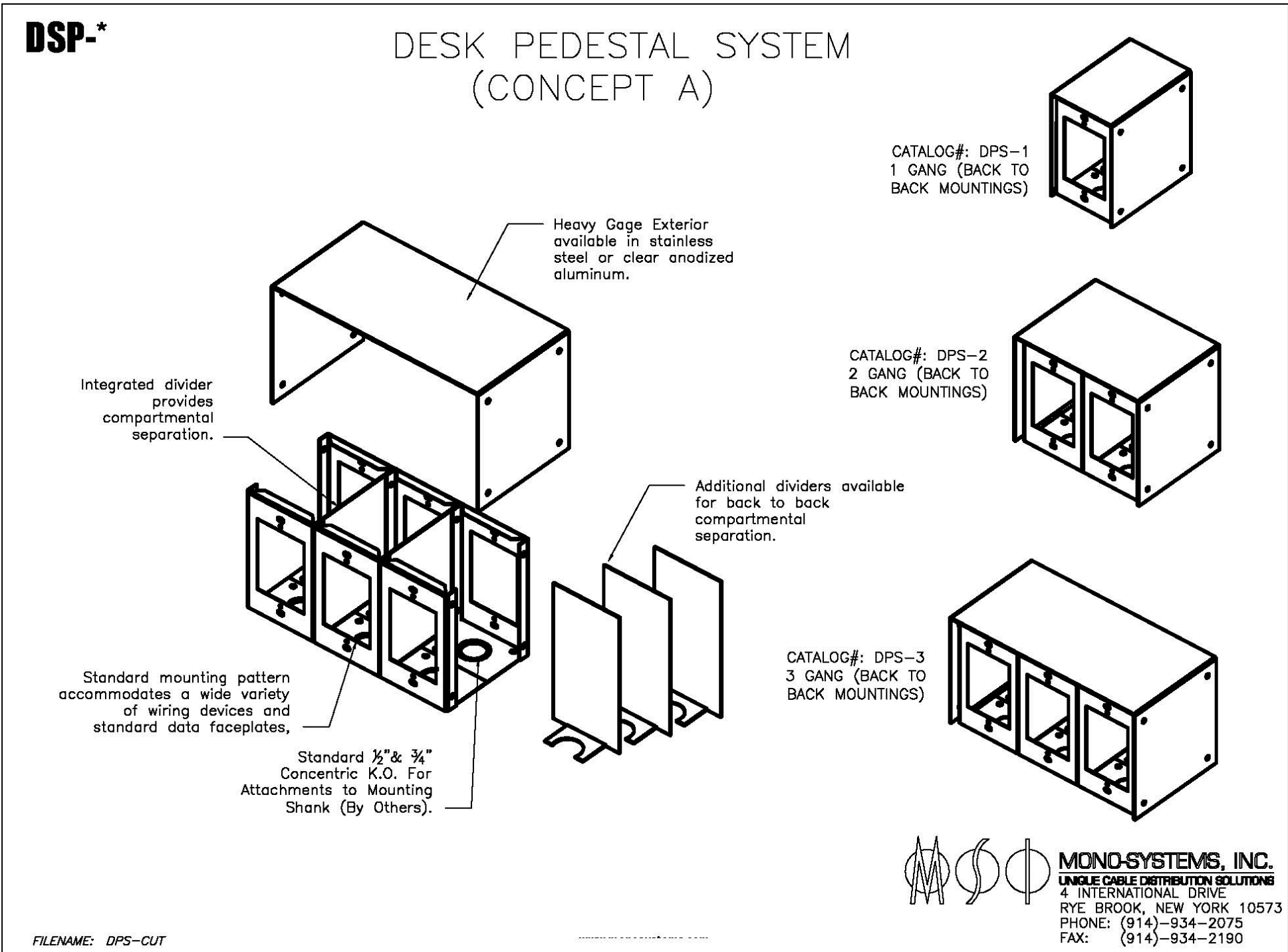
SECTION (ROUNDED COMPARTMENTS)

P/N: VPL-7772345-2D2R



MONO-SYSTEMS, INC.
 UNIQUE CABLE DISTRIBUTION SOLUTIONS
 4 INTERNATIONAL DRIVE
 RYE BROOK, NEW YORK 10573
 PHONE: (914)-934-2075
 FAX: (914)-934-2190

8/5/08 DOCUMENT REF. NO.: 7772345-2D2



SteamScrubber® Laboratory Glassware Washers

SPECIFICATIONS & ORDERING INFORMATION



SteamScrubber Laboratory Glassware Washer 4400330 is shown with 48-Pin Insert 4591601, Petri Dish Insert 4589701, Bulk Tube Insert 4542100, Utensil Holder 4542500 and BOD Bottle Insert 4589201.



All models feature:

- Upper and lower standard open racks of Type 304 stainless steel
- LCD information center, Display button, Run/Cancel button, scroll buttons and selection buttons to program and monitor cycles
- Pump to recirculate 96 gal/min (363 liters) when operated on 115 Volts, 60 Hz and 230 Volts, 50 Hz and 112 gal/min (424 liters/min) on 230 Volts, 60 Hz
- Drain pump to evacuate over 7 gal/min (26 liters/min)
- Purified water pump to bring non-pressurized or pressurized purified water into the tank for up to six pure water rinses
- Steam generator that produces hot vapor before the WASH 2 cycle (RINSE ONLY and PLASTIC programs excluded)
- Aluminum-backed insulation and fiberglass blanket for thermal and sound insulation
- Operation at 58 decibels
- Manual-fill detergent dispenser for powder or liquid detergent
- Manual-fill rinse aid solution dispenser
- Forced air drying programmable up to 99 minutes and from 38-70°C (100-158° F)
- Seven factory-set cycle programs: RINSE ONLY, PLASTIC, GLASS, GLASS PLUS, SCIENCE, SCIENCE PLUS, and DRY ONLY. All 208/230 Volt models have three additional programs for a total of ten: INTENSE, INTENSE PLUS and EXTREME.
- Two user-set cycle programs
- Alarms with display for HOT GLASS, PLEASE WAIT, WATER LOW, WATER HIGH, OVERFLOW, LIQ DETER, RINSE AID DRAIN FAIL and LOW TEMP. Audible alarms self cancel after one minute.
- User-set delayed start (up to 8 hours)

- Type 304 stainless steel top, door, tank, upper, middle and lower wash arms. Freestanding models also have stainless steel exterior sides and top.
- One-piece, stainless steel, fine mesh particle drain filter
- Four leveling feet
- 3/8" Female NPT inlet fitting for hot tap water connection
- Factory-installed drain hose and band clamp
- Two year warranty on parts and labor
- Made in the U.S.A.
- IQ/OQ available. Visit www.labconco.com or call 800-821-5525.

All models conform to:

- UL 3101-1/61010-1
- CAN/CSA C22.2 No. 1010-1
- CE Conformity Marking (208/230 Volt models only)

All models require:

- Minimum inlet water temperature 49° C (120° F)
- Recommended inlet water temperature 60° C (140° F)
- Minimum purified water pressure 0 psi
- Water consumption per fill 3.4 gallons (13 liters)
- Hot tap water pressure at the washer 20-120 psi (138-827 KPa)
- Hot tap water flow rate 1.25 gallons (4.7 liters) per minute
- 3/8" OD copper tubing for connection to the water inlet valve
- Purified water with supply piping minimum 3/8" ID to permit at least 0.9 gallon (3.4 liters) per minute flow

Options include:

- Freestanding and undercounter styles
- Water temperature to 82° C (180° F) on 115 Volt models and 93° C (199° F) on 230 Volt models
- Clear tempered safety glass viewing window and 25-watt interior light that illuminates when door is latched

Optional accessories and companion products on pages 18 - 22 include:

- Base Stand
- Upper and Lower Spindle Racks
- Baskets and Inserts
- Freestanding-to-Mobile Conversion Kits
- Drain Water Cooling Kit
- LabSolutions Detergents and Rinse
- ScrubberMate Cart, Glassware Carts and Carboy Caddy
- WaterPro RO Stations and accessories

Catalog #	Style	Electrical Requirements	Maximum Internal Water Temperature	Viewing Window and Light	Overall Dimensions with Door Closed	Shipping Weight
4400320	Undercounter	115 Volts, 60 Hz, 16 Amps	82° C (180° F)	No	24.1" w x 27.4" d x 34.1-36.1" h	206 lbs. (93 kg)
4400321	Undercounter	208/230 Volts, 50/60 Hz, 12 Amps	93° C (199° F)	No	24.1" w x 27.4" d x 34.1-36.1" h	206 lbs. (93 kg)
4400330	Undercounter	115 Volts, 60 Hz, 16 Amps	82° C (180° F)	Yes	24.1" w x 27.4" d x 34.1-36.1" h	206 lbs. (93 kg)
4400331	Undercounter	208/230 Volts, 50/60 Hz, 12 Amps	93° C (199° F)	Yes	24.1" w x 27.4" d x 34.1-36.1" h	206 lbs. (93 kg)
4400420	Freestanding	115 Volts, 60 Hz, 16 Amps	82° C (180° F)	No	24.2" w x 27.5" d x 34.2-36.2" h	235 lbs. (107 kg)
4400421	Freestanding	208/230 Volts, 50/60 Hz, 12 Amps	93° C (199° F)	No	24.2" w x 27.5" d x 34.2-36.2" h	235 lbs. (107 kg)
4400430	Freestanding	115 Volts, 60 Hz, 16 Amps	82° C (180° F)	Yes	24.2" w x 27.5" d x 34.2-36.2" h	235 lbs. (107 kg)
4400431	Freestanding	208/230 Volts, 50/60 Hz, 12 Amps	93° C (199° F)	Yes	24.2" w x 27.5" d x 34.2-36.2" h	235 lbs. (107 kg)

Perfectus Laboratory feature

SteamScrubber® Laboratory Glassware Washers

FEATURES & BENEFITS

For washing and drying primarily beakers and other wide-mouth or specialized glassware.

Steam generator. Produces hot vapor to penetrate and soften dried contaminants for more effective cleaning.

Forced air drying system. Hot air is blown into the tank to dry glassware. No separate dryer or oven is needed.

Dual pumps, one for washing and one for draining, reduce the potential for cross contamination.

Powerful pump recirculates water at a high rate to dislodge dried contaminants for thorough cleaning. Water recirculates at 96 gal/min (363 liters/min) on 115 Volt, 60 Hz and 230 Volt, 50 Hz models and 112 gal/min (424 liters/min) on 230 Volt, 60 Hz models.

Versatile rack options. The standard open racks are interchangeable with optional upper and lower spindle racks. Additional racks are sold separately. See page 18.

User-set delayed start (up to 8 hours) may be programmed so that the washer operates during off-peak hours when electricity may be less expensive and more plentiful.

Up to 6 pure water rinses may be programmed. A built-in purified water pump draws from a storage tank or pressurized source for final rinses.

360° rotating upper, middle and lower wash arms distribute water and detergent.

Full two year warranty. Is provided against defects in materials and workmanship.

Attractive and durable Type 304 stainless steel door and tank. Freestanding models also have stainless steel sides and top.

Detergent dispenser for powder or liquid detergent. Releases a manually premeasured amount ensuring clean labware.

Quiet, energy-efficient operation at 58 decibels. Aluminum-backed, sound-deadening insulation and fiberglass blanket absorb noise and optimize internal tank temperature to conserve energy.



INCLUDES Upper and lower stainless steel standard open racks. Accommodate a variety of accessory inserts holding the broadest range of glassware. Inserts are sold separately. See pages 18 and 19.

Sanitizing high heat. Water temperature reaches 93° C (199° F) on 230 Volt models to sanitize glassware and for enhanced washing, rinsing and faster drying.

Rinse solution dispenser. Allows manual addition of mildly acidic rinse to alter pH and eliminate alkaline detergent carry-over. The dispenser holds approximately 170 milliliters, enough for 40 or more cycles.

Alarms sound and/or display on the LCD to alert the user to abnormal or unsafe events such as HOT GLASS and OVERFLOW.

Optional clear tempered safety glass viewing window with 25-watt interior light allows observation of the cycle in progress. Available standard on some models.

ETL-listed. Washers carry the ETL mark signifying they are certified to UL Standard 3101-1/61010-1 and CAN/CSA C22.2 No. 1010.1.

CE Mark. Washers conform to the CE (European Community) requirements for electrical safety and electromagnetic compatibility.



Exclusive Labconco feature

There is no formal standard for ventilation of anatomy labs with respect to air change rate. However, 18 to 20 air changes per hour is a common figure used in documents addressing the design of anatomy labs. With proper high/low design, the maximum permissible exposure limit of 0.5 ppm (action level) can be maintained.

Formaldehyde

Formaldehyde is a colorless, strong-smelling gas often found in aqueous (water-based) solutions. Commonly used as a preservative in medical laboratories and mortuaries, formaldehyde is also found in many products such as chemicals, particle board, household products, glues, permanent press fabrics, paper product coatings, fiberboard, and plywood. It is also widely used as an industrial fungicide, germicide and disinfectant.

Although the term formaldehyde describes various mixtures of formaldehyde, water, and alcohol, the term “formalin” is used to describe a saturated solution of formaldehyde dissolved in water, typically with another agent, most commonly methanol, added to stabilize the solution. Formalin is typically 37% formaldehyde by weight (40% by volume) and 6-13% methanol by volume in water. The formaldehyde component provides the disinfectant effects of formalin.

What Employers Should Know

The OSHA Formaldehyde standard (29 CFR 1910.1048) and equivalent regulations in states with OSHA-approved state plans protects workers exposed to formaldehyde and apply to all occupational exposures to formaldehyde from formaldehyde gas, its solutions, and materials that release formaldehyde.

- The permissible exposure limit (PEL) for formaldehyde in the workplace is 0.75 parts formaldehyde per million parts of air (0.75 ppm) measured as an 8-hour time-weighted average (TWA).
- The standard includes a second PEL in the form of a short-term exposure limit (STEL) of 2 ppm which is the maximum exposure allowed during a 15-minute period.
- The action level – which is the standard’s trigger for increased industrial hygiene monitoring and initiation of worker medical surveillance – is 0.5 ppm when calculated as an 8-hour TWA.

Harmful Effects on Workers

Formaldehyde is a sensitizing agent that can cause an immune system response upon initial exposure. It is also a cancer hazard. Acute

exposure is highly irritating to the eyes, nose, and throat and can make anyone exposed cough and wheeze. Subsequent exposure may cause severe allergic reactions of the skin, eyes and respiratory tract. Ingestion of formaldehyde can be fatal, and long-term exposure to low levels in the air or on the skin can cause asthma-like respiratory problems and skin irritation such as dermatitis and itching. Concentrations of 100 ppm are immediately dangerous to life and health (IDLH).

Note: The National Institute for Occupational Safety and Health (NIOSH) considers 20 ppm of formaldehyde to be IDLH.

Routes of Exposure

Workers can inhale formaldehyde as a gas or vapor or absorb it through the skin as a liquid. They can be exposed during the treatment of textiles and the production of resins. In addition to healthcare professionals and medical lab technicians, groups at potentially high risk include mortuary workers as well as teachers and students who handle biological specimens preserved with formaldehyde or formalin.

How Employers Can Protect Workers

Airborne concentrations of formaldehyde above 0.1 ppm can cause irritation of the respiratory tract. The severity of irritation intensifies as concentrations increase.

Provisions of the OSHA standard require employers to do the following:

- Identify all workers who may be exposed to formaldehyde at or above the action level or STEL through initial monitoring and determine their exposure.

- Reassign workers who suffer significant adverse effects from formaldehyde exposure to jobs with significantly less or no exposure until their condition improves. Reassignment may continue for up to 6 months until the worker is determined to be able to return to the original job or to be unable to return to work – whichever comes first.
- Implement feasible engineering and work practice controls to reduce and maintain worker exposure to formaldehyde at or below the 8-hour TWA and the STEL. If these controls cannot reduce exposure to or below the PELs, employers must provide workers with respirators.
- Label all mixtures or solutions composed of greater than 0.1 percent formaldehyde and materials capable of releasing formaldehyde into the air at concentrations reaching or exceeding 0.1 ppm. For all materials capable of releasing formaldehyde at levels above 0.5 ppm during normal use, the label must contain the words “potential cancer hazard.”
- Train all workers exposed to formaldehyde concentrations of 0.1 ppm or greater at the time of initial job assignment and whenever a new exposure to formaldehyde is introduced into the work area. Repeat training annually.
- Select, provide and maintain appropriate personal protective equipment (PPE). Ensure that workers use PPE such as impervious clothing,

gloves, aprons, and chemical splash goggles to prevent skin and eye contact with formaldehyde.

- Provide showers and eyewash stations if splashing is likely.
- Provide medical surveillance for all workers exposed to formaldehyde at concentrations at or above the action level or exceeding the STEL, for those who develop signs and symptoms of overexposure, and for all workers exposed to formaldehyde in emergencies.

Recordkeeping Requirements

Employers are required to do the following regarding worker exposure records:

- Retain exposure records for 30 years.
- Retain medical records for 30 years after employment ends.
- Allow access to medical and exposure records to current and former workers or their designated representatives upon request.

Additional Information

For more information on this, and other health-related issues affecting workers, visit OSHA’s web site at www.osha.gov.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; the teletypewriter (TTY) number is (877) 889-5627.

For assistance, contact us. We can help. It’s confidential.

