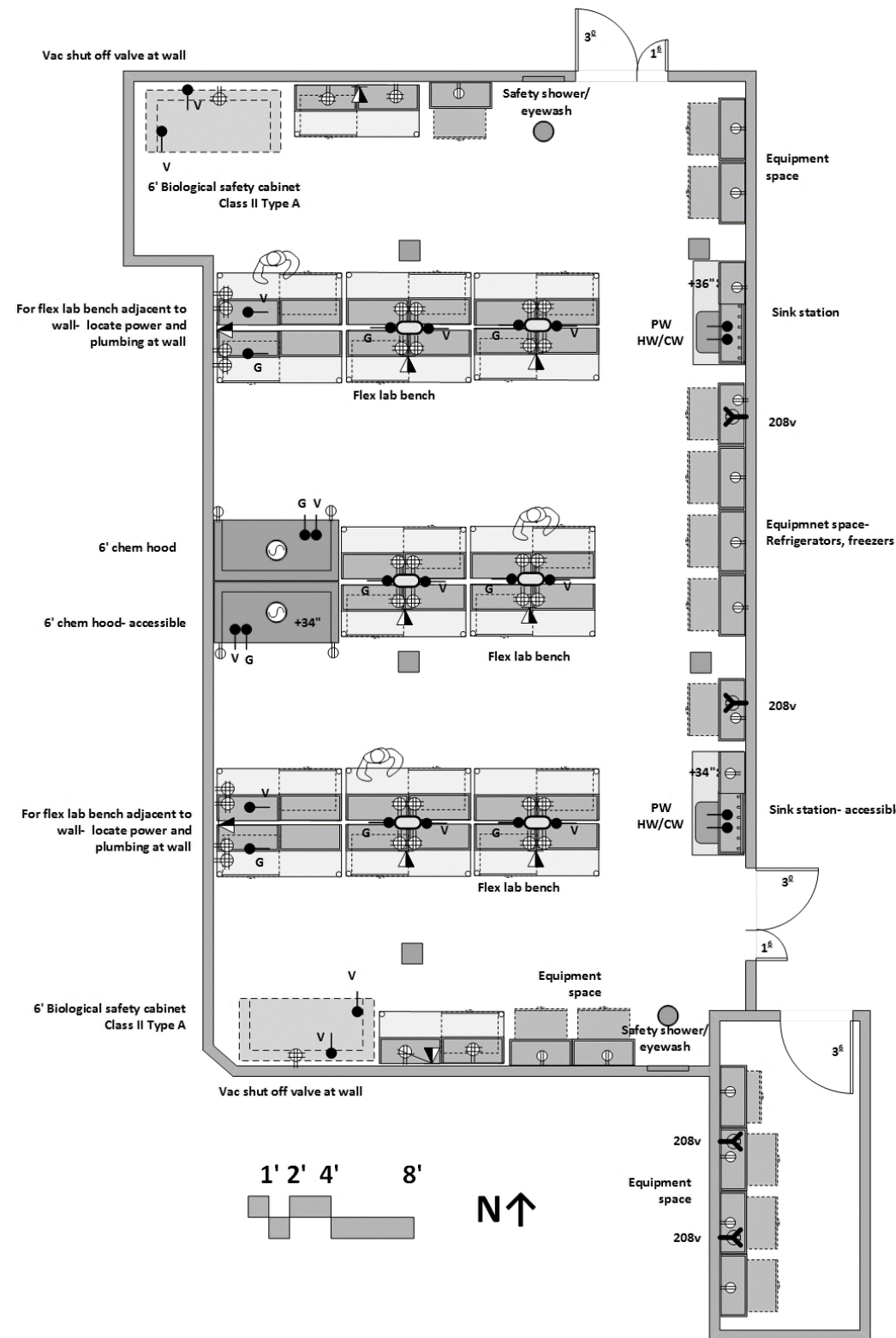


CONTENTS



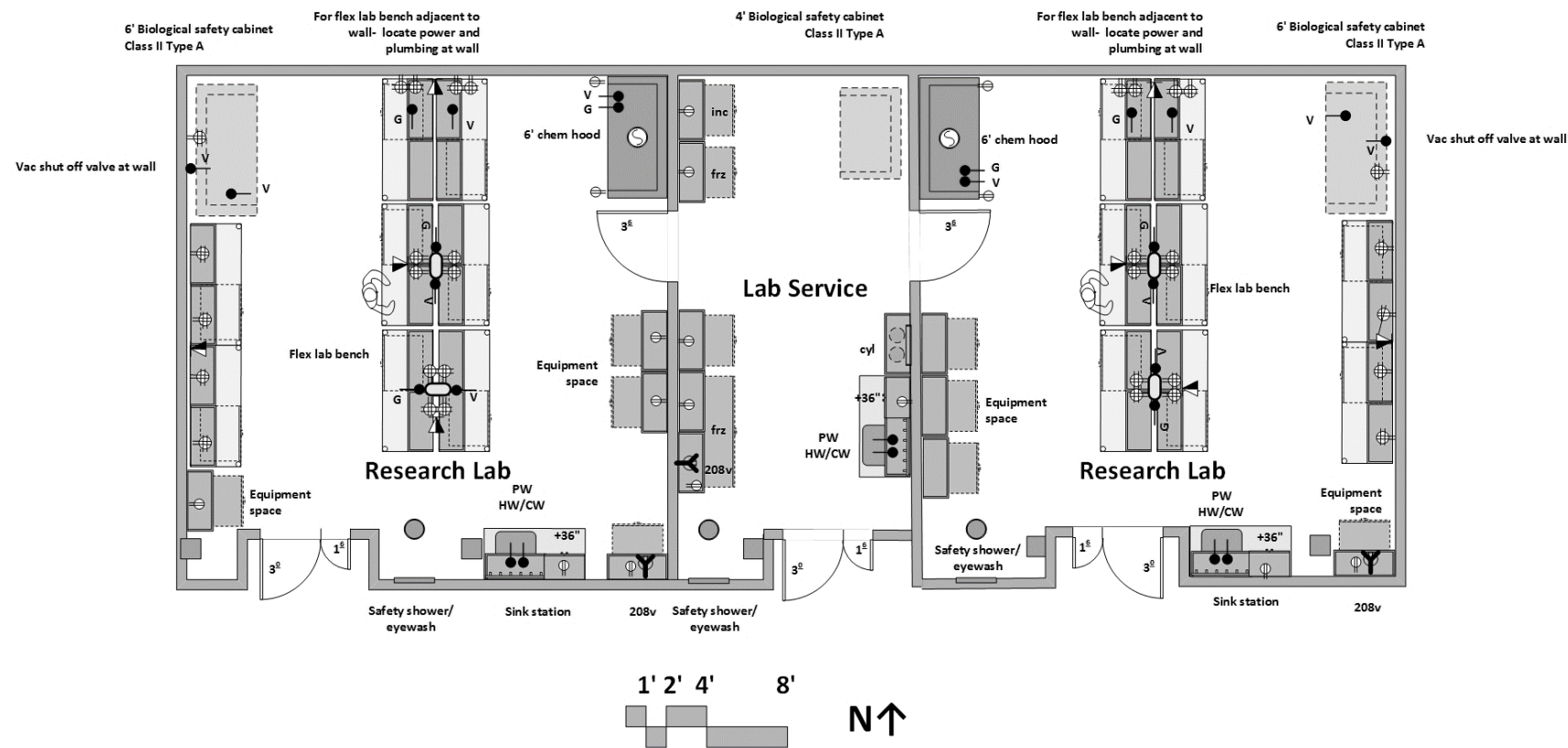
Executive Summary	3
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EXECUTIVE SUMMARY

This sketchbook provides the basis of design for the Veterinary Medicine Research Laboratories at Long Island University Post.

The lab design drawings contained herein represents a Design Development level of documentation.

All electrical outlets and plumbing fixtures have been noted for the research labs and the anatomy suite labs. Typical section details have been included.

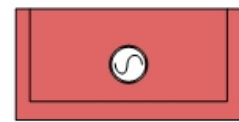


Glen Berry

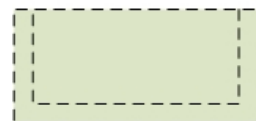
Glen Berry, AIA
Laboratory Planning Consultant to SBLM Architects



SYMBOL LEGEND



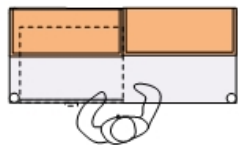
6' chemical fume hood
Variable Air Volume (VAV)
1200 cfm exhaust
Provide accessible fume hoods where noted



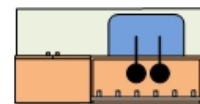
6' Biological Safety Cabinet (BSC)
Class II Type A
No external exhaust
Owner Furnished/Owner Installed



4' Biological Safety Cabinet (BSC)
Class II Type A
No external exhaust
Owner Furnished/Owner Installed



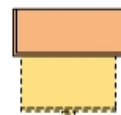
Flex lab bench
Unistrut powder coat frae
2 rows shelves above
Mobile base cabinet below
Integral power at unistrut
Gas/Vac valves connect to service drop above



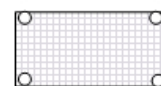
Sink station
Unistrut frame
Drying rack and shelf above
Hot/Cold faucet
Pure water faucet
Provide accessible sink stations where noted



Safety shower/eyewash
Floor drain below
Hard connection to eyewash drain
Do not daylight eyewash drain



Equipment space with 2 rows shelves above
Owner furnished floor equipment below
Power recessed at wall- 110v fourplex
Some 208v power at selected locations



Metro shelf unit
24"W x 48"L x 74" H
5 tier
Lockable casters



Utility table
44"x22"



Cylinder restraint

HW/CW



Hot/Cold water
Infrared sensor
Vacuum breaker
115v power per div 26

PW



Pure water faucet



Gas valve



Vacuum valve



115v fourplex outlet
Dedicated circuit if located at equipment space
Standby power at equipment space



115v duplex outlet
Dedicated circuit if located at equipment space
Standby power at equipment space



Data junction box
Number and type of ports by Owner

208v



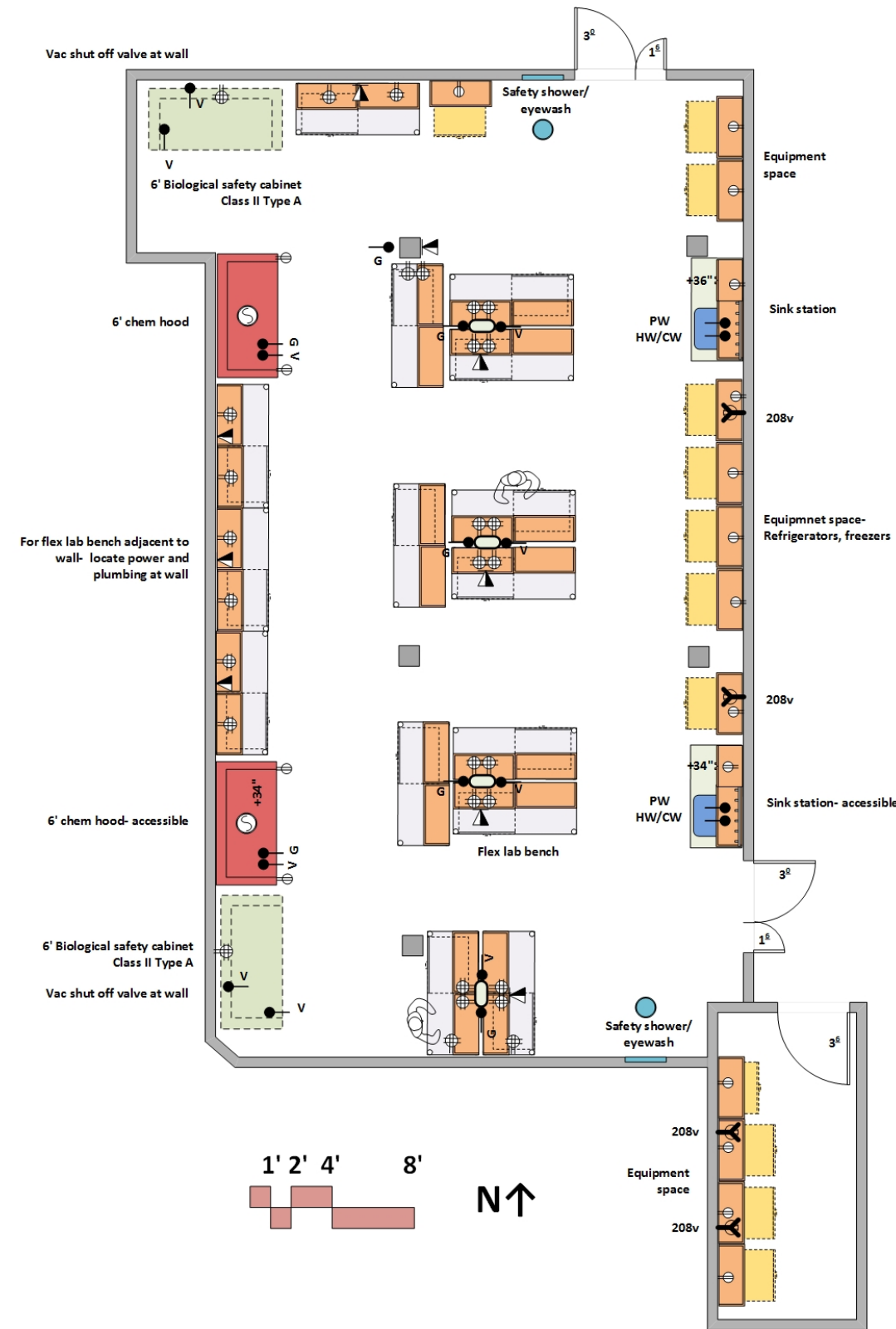
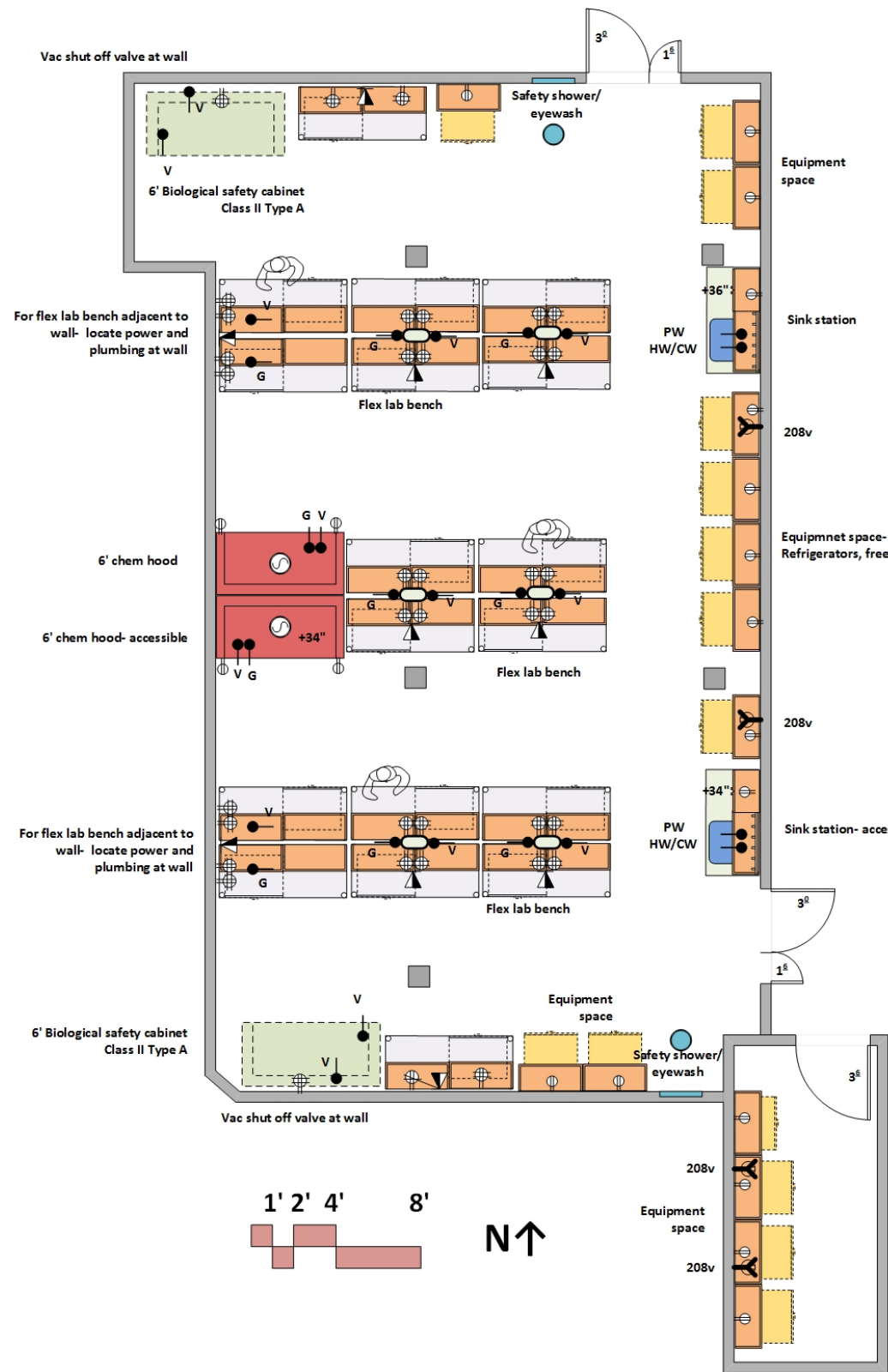
208v single phase 20 amp
Dedicated circuit

+34"

Work surface at 34" above floor
accessible

VET MED RESEARCH LABORATORY #1

Northwest



ARCHITECTURAL

Occupancy: B
 Floor: VET (vinyl enhanced tile)
 Ceiling: acoustic tile at 9' or higher
 Doors: 3'-0"/1"-6" pair x8'-0" with view window at corridor
 3'-6" x 8'-0" at interior door
 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: 8 air changes/hour
 4 air changes per hour unoccupied
 Air change rate may be higher due to equipment heat gain
 Equipment heat gain in Equipment Room: 75 btuh/sf
 Equipment heat gain in main lab: 25 btuh/sf
 Pressure: Negative
 N+1 redundancy on all building mech equipment

PLUMBING

Hot/Cold water at sinks with vacuum breakers
 Pure water at sinks
 Domestic tepid water at safety shower/eyewash
 Floor drain at safety shower/eyewash
 N+1 redundancy on all building plumbing equipment

ELECTRICAL

115v20a1ph outlets at walls and ceilings (cage racks)
 Emer power for lab exhaust
 Standby power at equipment space
 Hardwire and wireless data
 Lighting: LED at 600 LUX

CONTRACTOR FURNISHED EQUIPMENT

Flex lab bench system
 Lab casework
 Safety shower/eyewash in vestibule
 Chemical fume hood

UNIVERSITY FURNISHED EQUIPMENT

Biological safety cabinet
 Scientific Equipment
 Freezers and refrigerators

←Note: 2 options shown to address column locations
 Option at left has 18 lab workstations
 Option at right has 15 lab workstations

VET MED RESEARCH LABORATORY #2

Northeast

ARCHITECTURAL

Occupancy: B
 Floor: VET (vinyl enhanced tile)
 Ceiling: acoustic tile at 9' or higher
 Doors: 3'-0"/1"-6" pair x8'-0" with view window at corridor
 3'-6" x 8'-0" at interior door
 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: 8 air changes/hour occupied
 4 air changes per hour unoccupied
 Air change rate may be higher due to equipment heat gain
 Equipment heat gain in Equipment Room: 75 btuh/sf
 Equipment heat gain in main lab: 25 btuh/sf
 Pressure: Negative
 N+1 redundancy on all building mech equipment

PLUMBING

Hot/Cold water at sinks with vacuum breakers
 Pure water at sinks
 Domestic tepid water at safety shower/eyewash
 Floor drain at safety shower/eyewash
 N+1 redundancy on all building plumbing equipment

ELECTRICAL

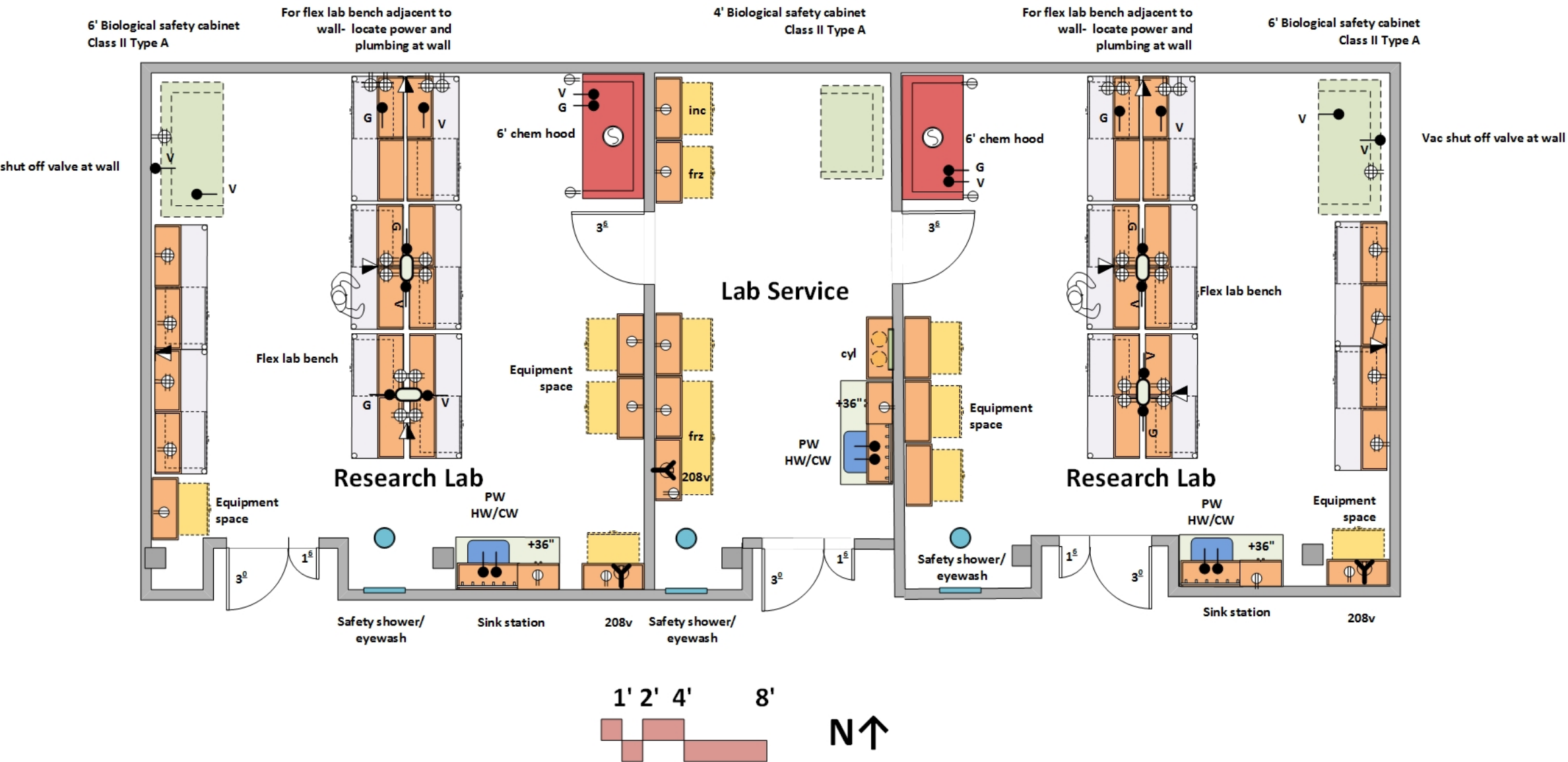
115v20a1ph outlets at walls and ceilings (cage racks)
 Emer power for lab exhaust
 Standby power at equipment space
 Hardwire and wireless data
 Lighting: LED at 600 LUX

CONTRACTOR FURNISHED EQUIPMENT

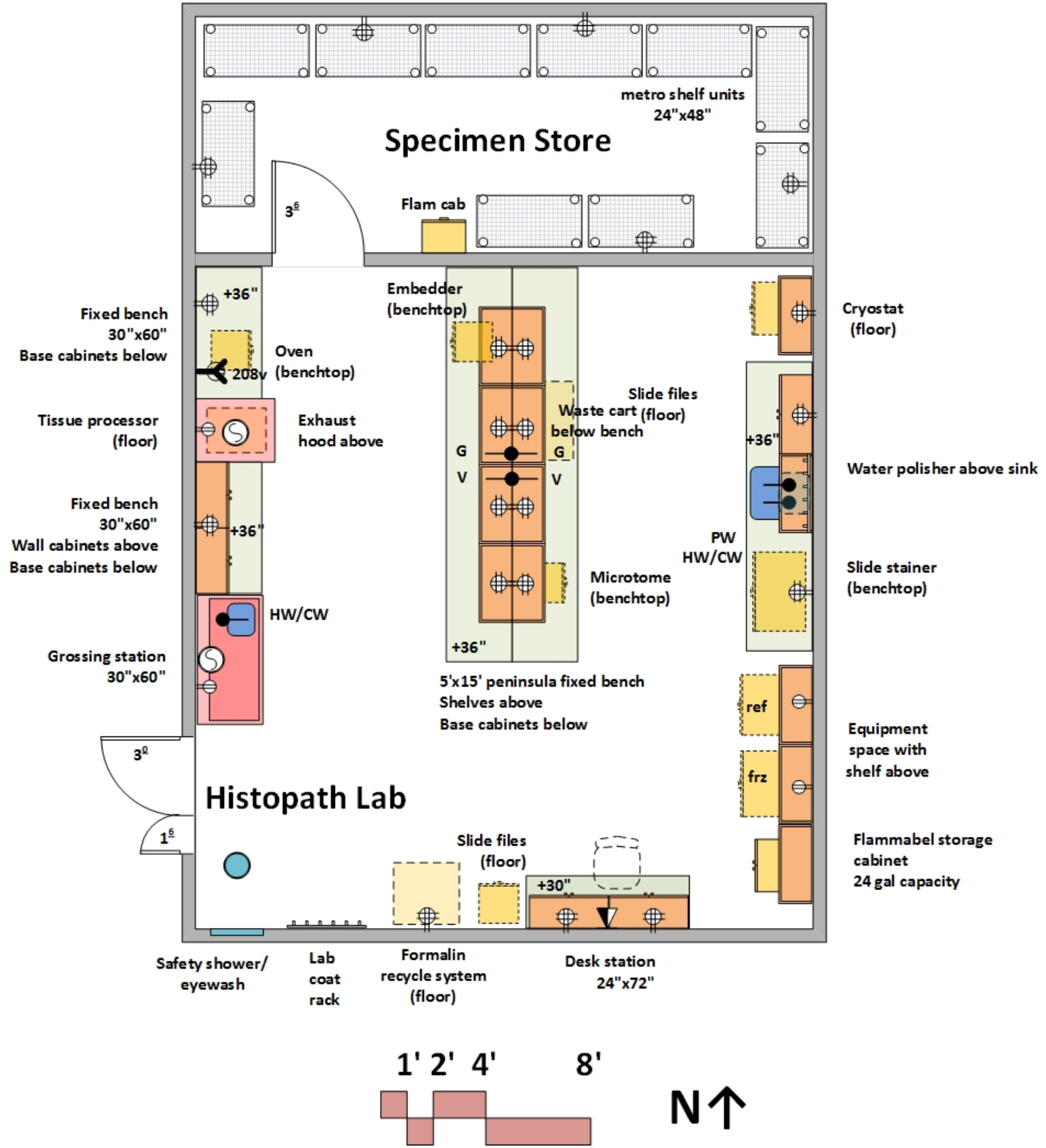
Flex lab bench system
 Lab casework
 Safety shower/eyewash in vestibule
 Cylinder restraint
 Chemical fume hood

UNIVERSITY FURNISHED EQUIPMENT

Biological safety cabinets
 Scientific Equipment
 CO2 and O2 cylinders
 Freezers and refrigerators
 Autoclave on cart
 Incubator
 Liquid Nitrogen Dewar



HISTOPATH/SPECIMEN LABORATORY



ARCHITECTURAL

Occupancy: B
 Floor: VET (vinyl enhanced tile)
 Ceiling: acoustic tile at 9' or higher
 Doors: 3'-0"/1"=6" pair x8'-0" with view window at corridor
 3'-6" x 8'=0" at interior door
 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: 8 air changes/hour occupied
 4 air changes per hour unoccupied
 Air change rate may be higher due to equipment heatgain
 Equipment heat gain in Equipment Room: 75 btuh/sf
 Equipment heat gain in main lab: 25 btuh/sf
 Pressure: Negative
 N+1 redundancy on all mech equipment

PLUMBING

Hot/Cold water at sinks with vacuum breakers
 Pure water at sinks
 Domestic tepid water at safety shower/eyewash
 Floor drain at safety shower/eyewash

ELECTRICAL

115v20a1ph outlets at walls and ceilings
 Emer power for lab exhaust
 Standby power at equipment space
 Hardwire and wireless data
 Lighting: LED at 600 LUX

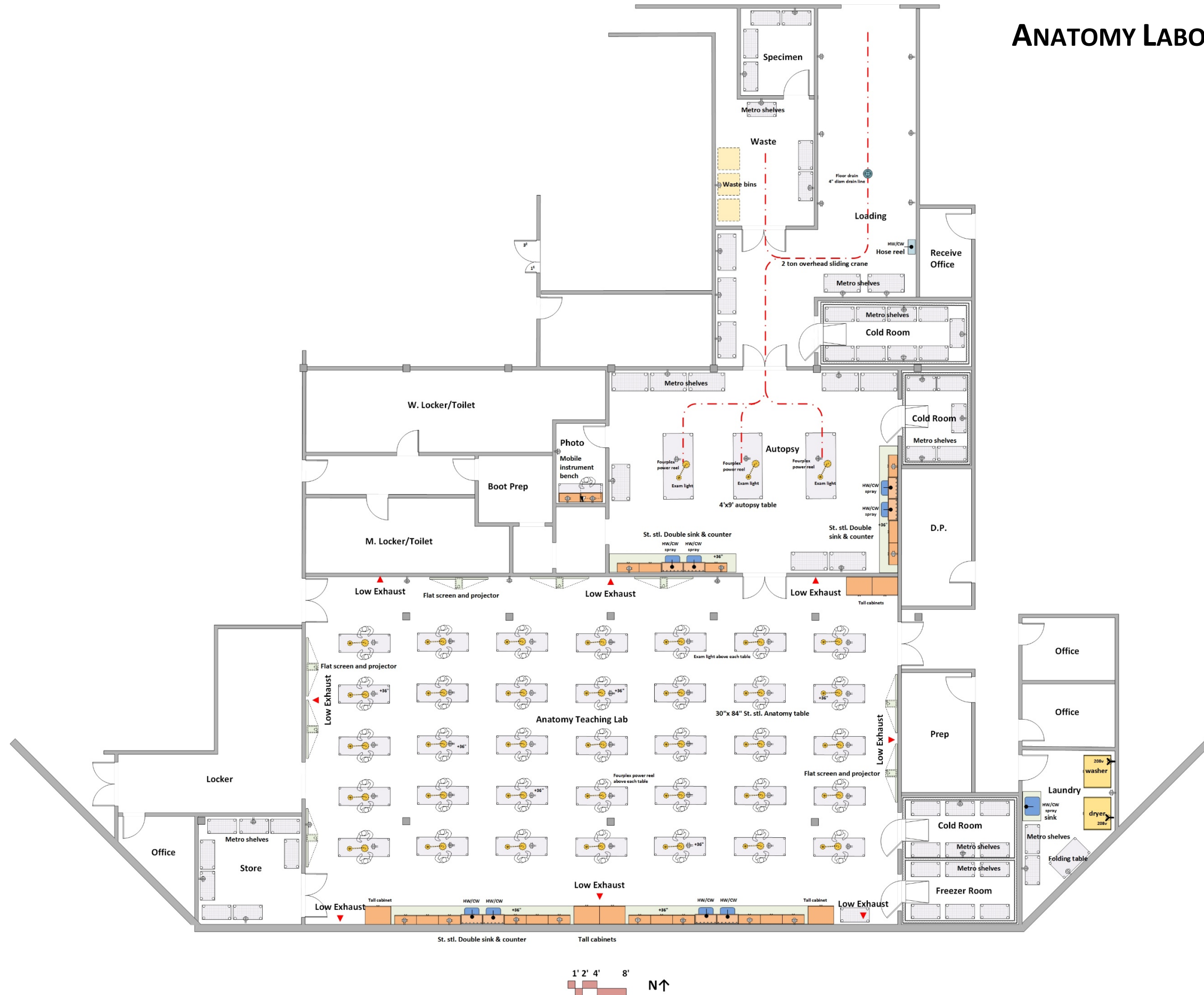
CONTRACTOR FURNISHED EQUIPMENT

Lab casework, sinks, tops, fittings
 Safety shower/eyewash in vestibule
 Grossing station
 Lab Coat Rack
 Flammable cabinet- 24 gallon

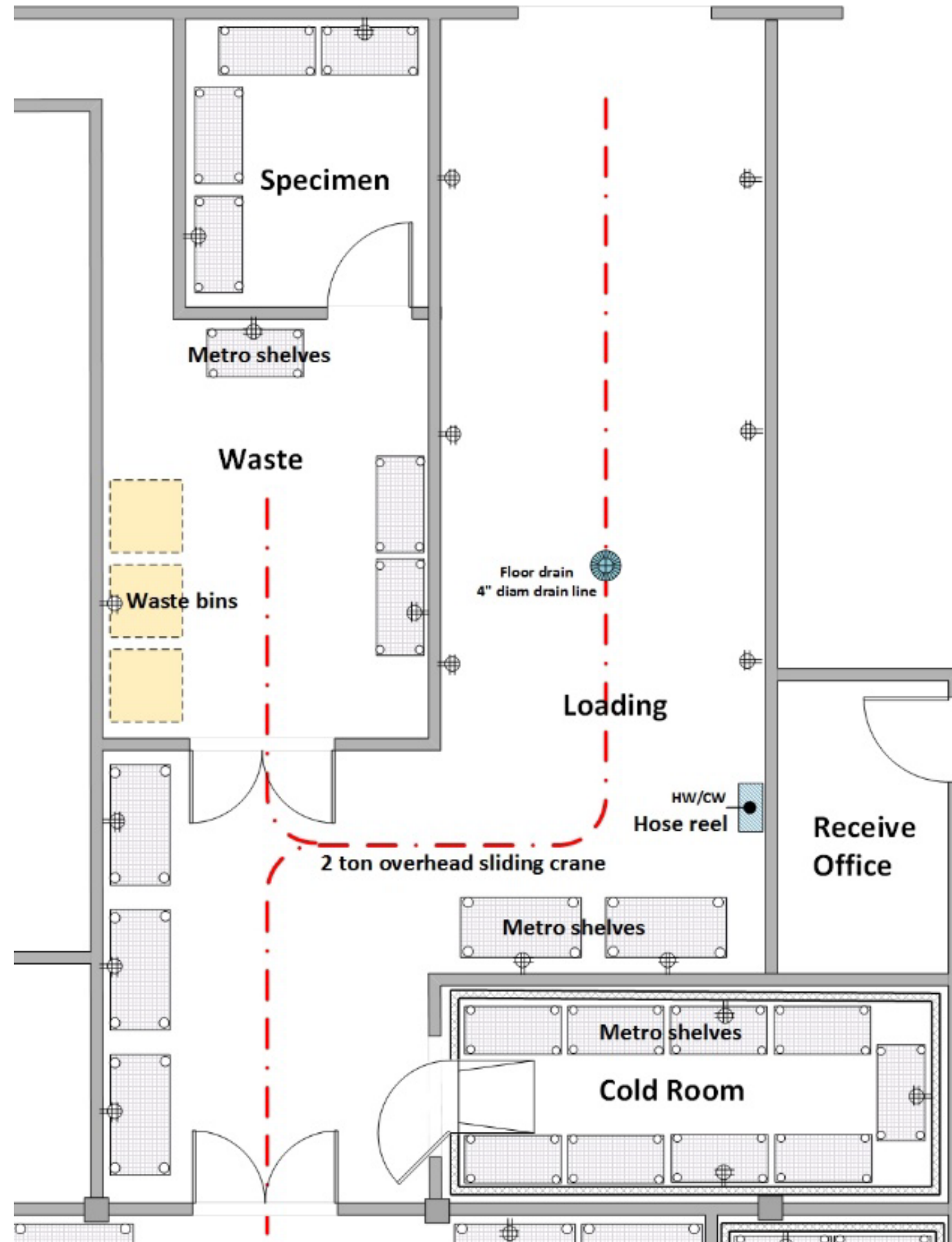
UNIVERSITY FURNISHED EQUIPMENT

Oven
 Tissue processor
 Cryostat
 Slide stainer
 Refrigerator
 Freezer
 Flammable storage cabinet
 Slide file cabinet
 Formalin Recycle System

ANATOMY LABORATORY SUITE



LOADING/WASTE/SPECIMEN Anatomy Lab Suite



ARCHITECTURAL

Occupancy: B
 Floor: Sealed concrete or methyl methacrylate with integral covered base
 Ceiling: mylar tile at 12' or higher or open to structure
 Doors: 3'-0"/3'-0" pair x8'-0" with view windows at paired doors
 3'-6" x 8'-0" at single lab doors
 3'-0" x 8'-0" at single office doors
 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: 8 air changes/hour
 Pressure: Negative

PLUMBING

Hot/Cold water at hose bib
 Floor drain

ELECTRICAL

115v20a1ph outlets at walls
 Lighting: LED at 600 LUX

CONTRACTOR FURNISHED EQUIPMENT

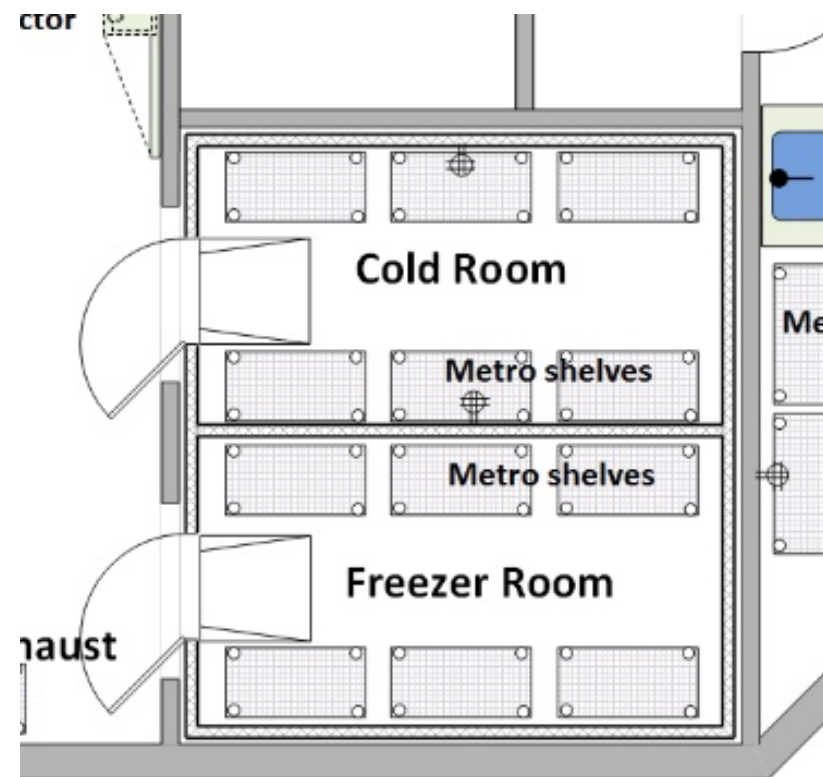
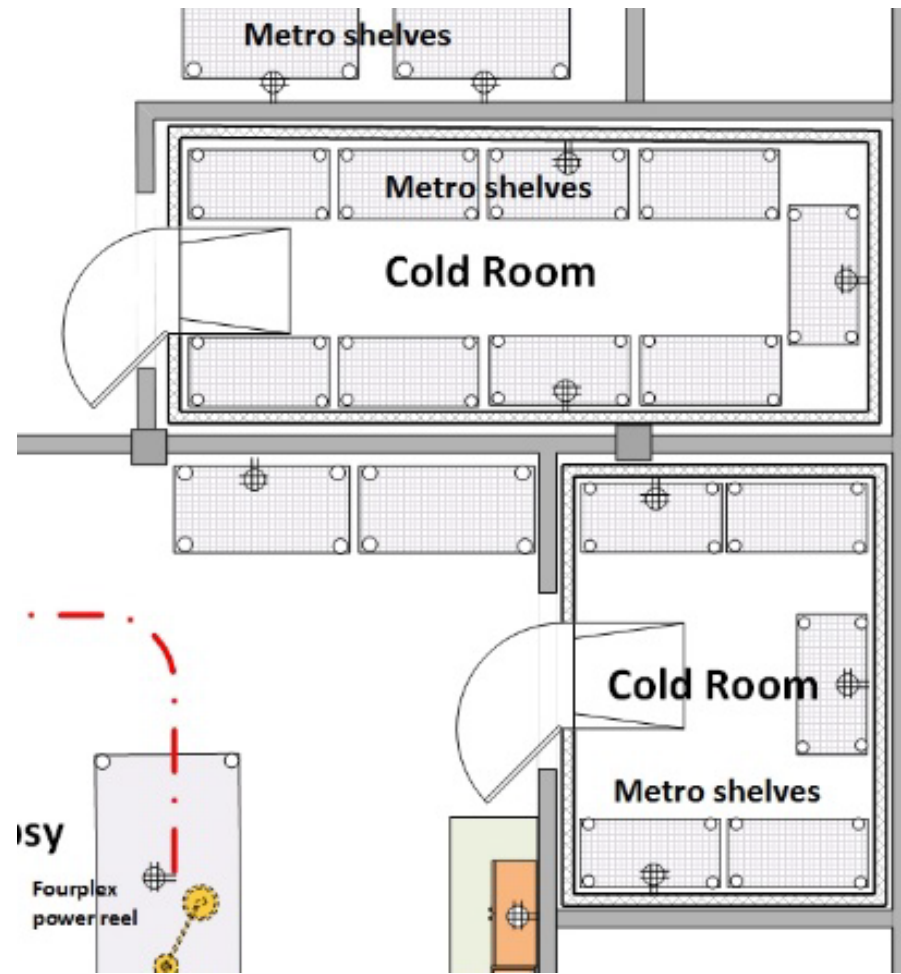
2 ton sliding crane system
 Metro shelf units

UNIVERSITY FURNISHED EQUIPMENT

Waste bins

COLD ROOMS/FREEZER ROOMS

Anatomy Lab Suite



ARCHITECTURAL

Occupancy: B
 Floor: 1" insulated panel with ramp at door
 Ceiling: 4" insulated panel with egg crate ceiling plenum at 8' above floor
 Doors: 3'-0" insulated door with view windows
 Sound attenuation: NC 45 or less
 Security: none

STRUCTURAL

Existing to remain

MECHANICAL

Cold Room Temperature: 4 degrees C plus/minus 2 degrees C
 Freezer Room Temperature: -20 degrees C plus/minus 2 degrees C

PLUMBING

None

ELECTRICAL

115v20a1ph outlets at walls
 Lighting: LED at 600 LUX

CONTRACTOR FURNISHED EQUIPMENT

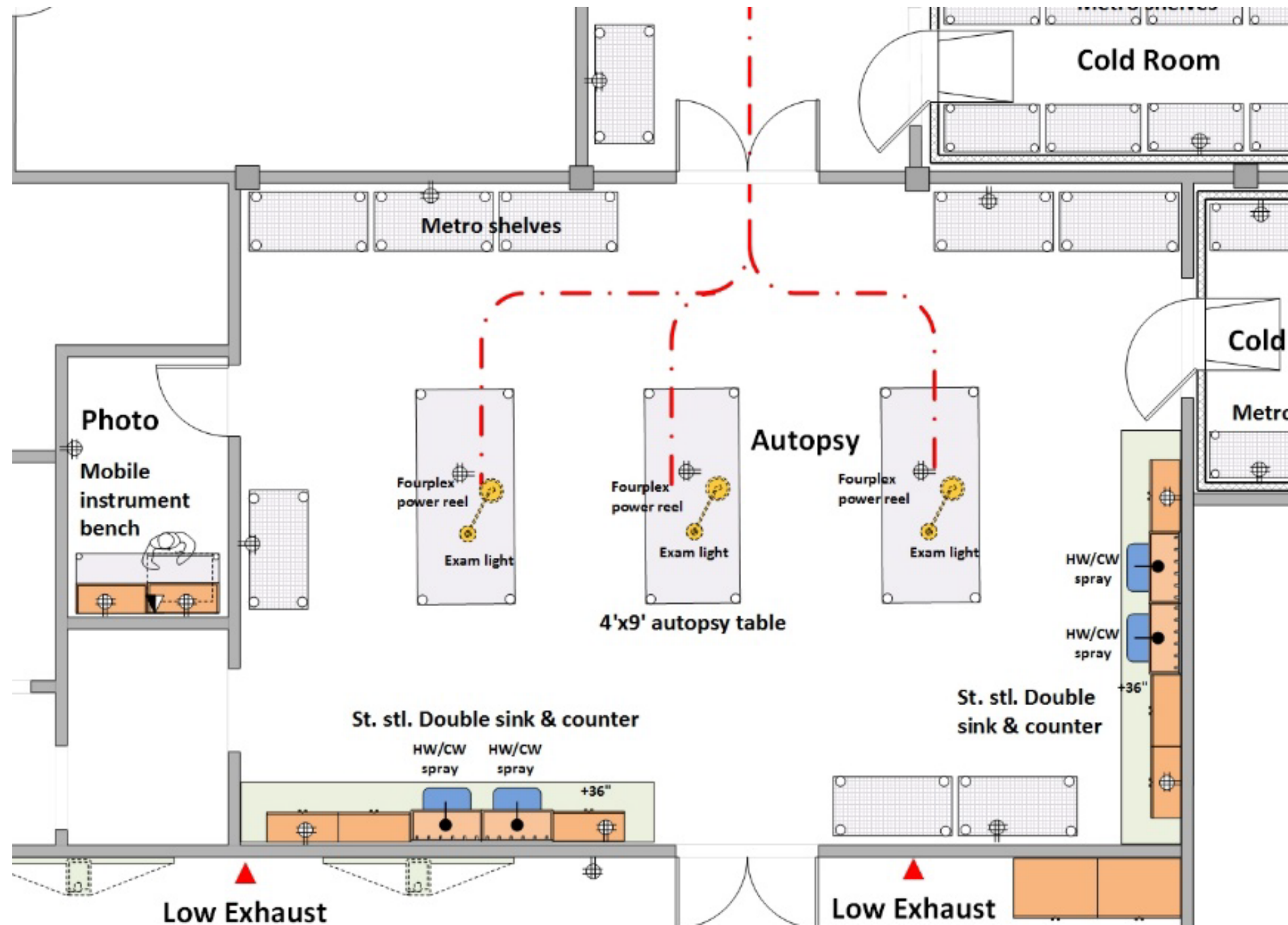
Metro shelf units

UNIVERSITY FURNISHED EQUIPMENT

None

AUTOPSY/PHOTO ROOMS

Anatomy Lab Suite



ARCHITECTURAL

Occupancy: B
 Floor: Sealed concrete or methyl methacrylate with integral covered base
 Ceiling: mylar tile at 12' or higher
 Doors: 3'-0"/3'-0" pair x8'-0" with view windows at paired doors
 3'-6" x 8'-0" at single lab doors
 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: 12 air changes/hour occupied
 6 air changes per hour unoccupied
 Air change rate may be higher due to equipment heatgain
 Equipment heat gain in Equipment Room: 25 btuh/sf
 Pressure: Negative
 N+1 redundancy on all building mech equipment

PLUMBING

Hot/Cold water at sinks
 Hot/Cold water at hose bib
 Floor sink
 N+1 redundancy on all building plumbing equipment

ELECTRICAL

115v20a1ph outlets at walls and ceilings
 Hardwire and wireless data
 Lighting: LED at 600 LUX

CONTRACTOR FURNISHED EQUIPMENT

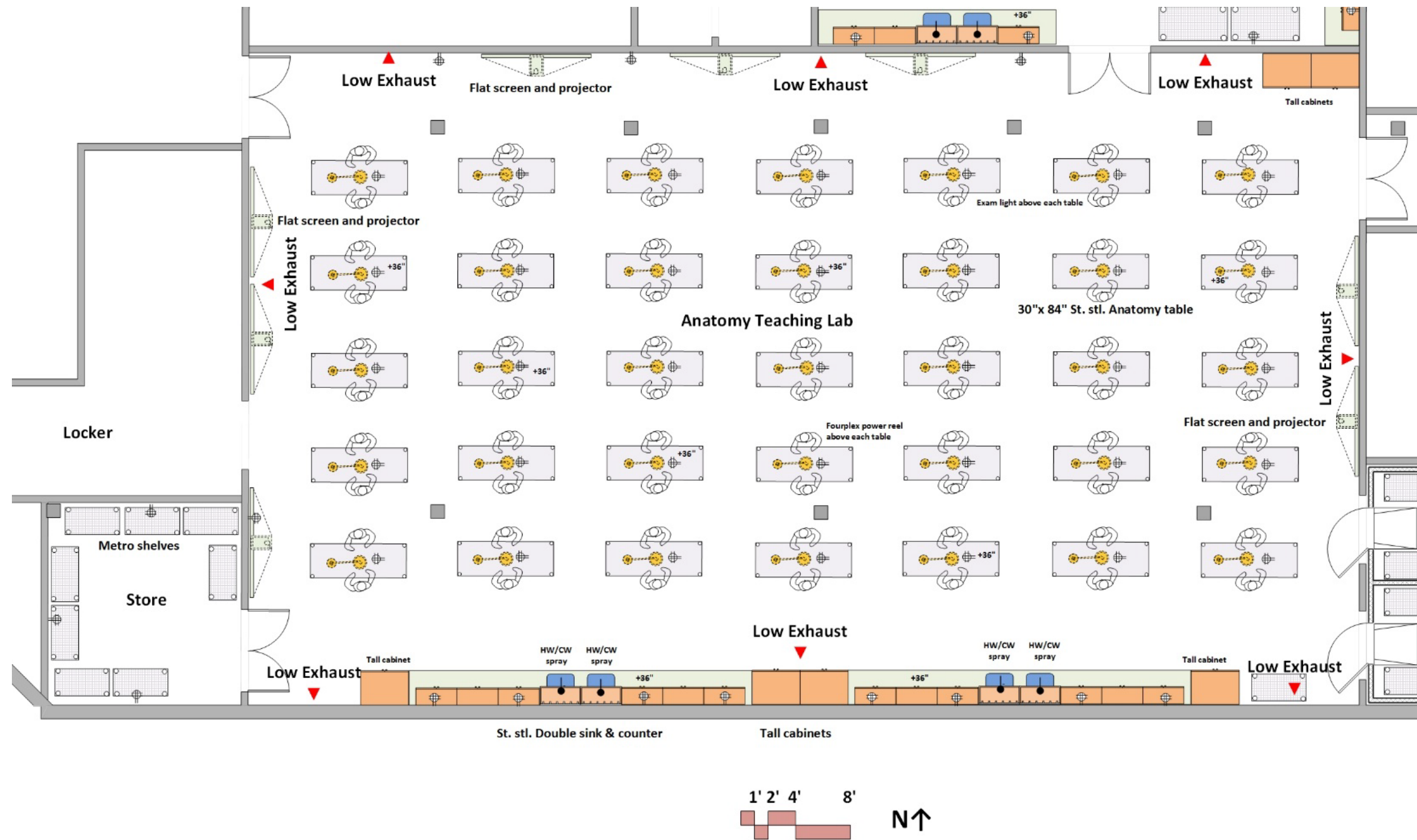
2 ton sliding crane system
 Stainless steel lab casework, sinks, tops, fittings
 Safety shower/eyewash
 Stainless steel autopsy tables
 Metro shelf units

UNIVERSITY FURNISHED EQUIPMENT

Scientific instruments

ANATOMY TEACHING LAB & STORE ROOM

Anatomy Lab Suite



ARCHITECTURAL

Occupancy: B
 Floor: Sealed concrete or methyl methacrylate with integral covered base
 Ceiling: mylar tile at 12' or higher
 Doors: 3'-0"/3'-0" pair x8'-0" with view windows at paired doors
 3'-6" x 8'-0" at single lab doors
 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: 20 air changes/hour
 10 air changes per hour unoccupied
 Provide 10 air changes per hour at ceiling exhaust
 Provide 10 air changes per hour at low perimeter exhaust
 Pressure: Negative
 N+1 redundancy on all building mech equipment

PLUMBING

Hot/Cold water at sinks
 Floor drains- location to be determined
 N+1 redundancy on all building plumbing equipment

ELECTRICAL

115v20a1ph outlets at walls and ceilings
 Hardwire and wireless data
 Lighting: LED at 600 LUX

CONTRACTOR FURNISHED EQUIPMENT

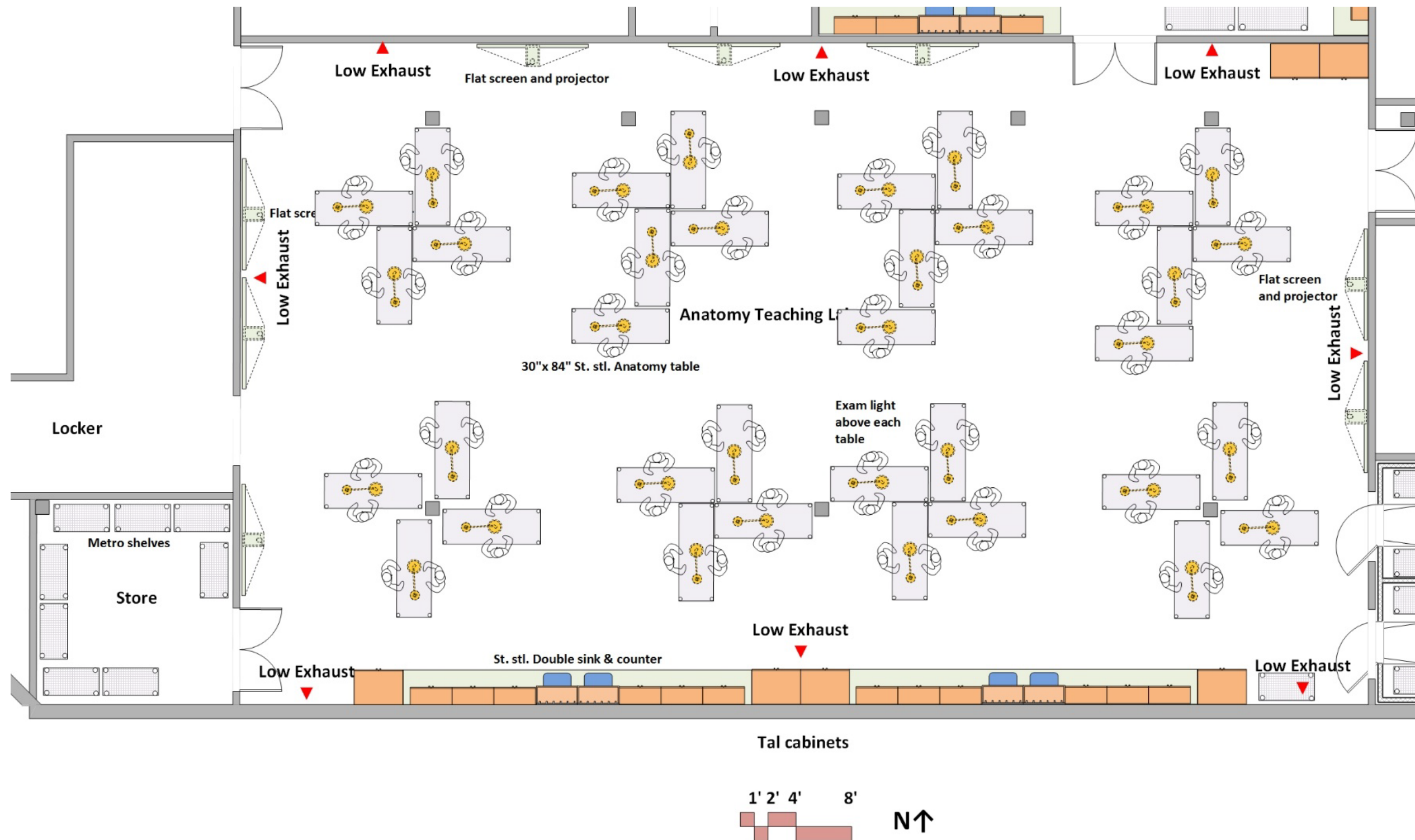
Stainless steel lab casework, sinks, tops, fittings
 Flat monitor screens and projectors at perimeter walls
 Exam lights at each anatomy tables
 Anatomy tables
 Metro shelf units

UNIVERSITY FURNISHED EQUIPMENT

Scientific instruments

ANATOMY TEACHING LAB & STORE ROOM

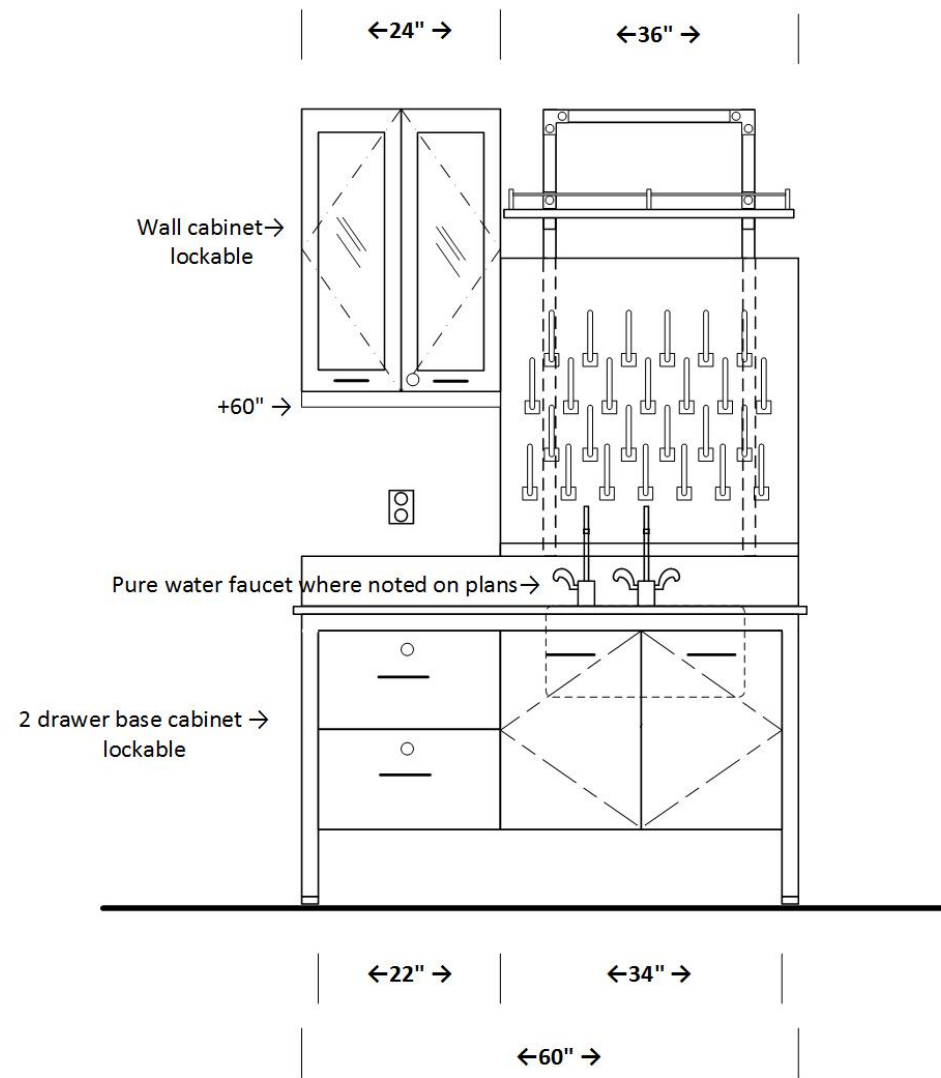
Anatomy Lab Suite
Option B- Pinwheel pattern



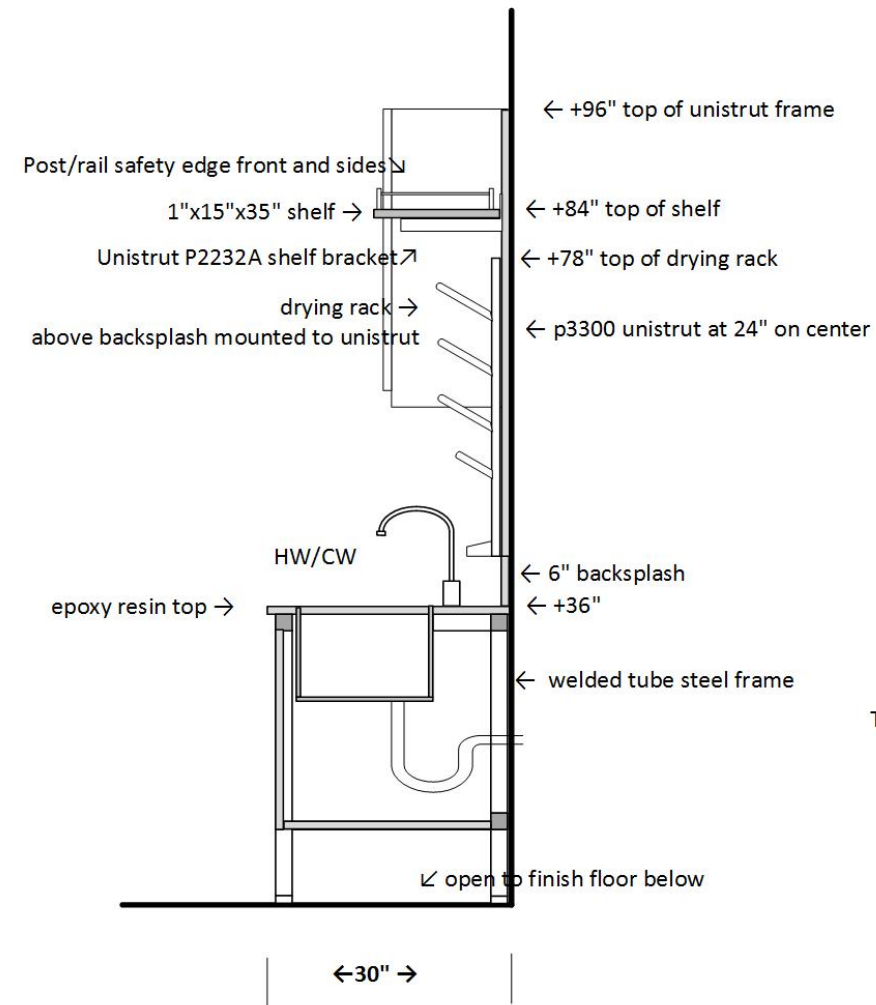
SECTION DETAILS

SECTION DETAIL #1

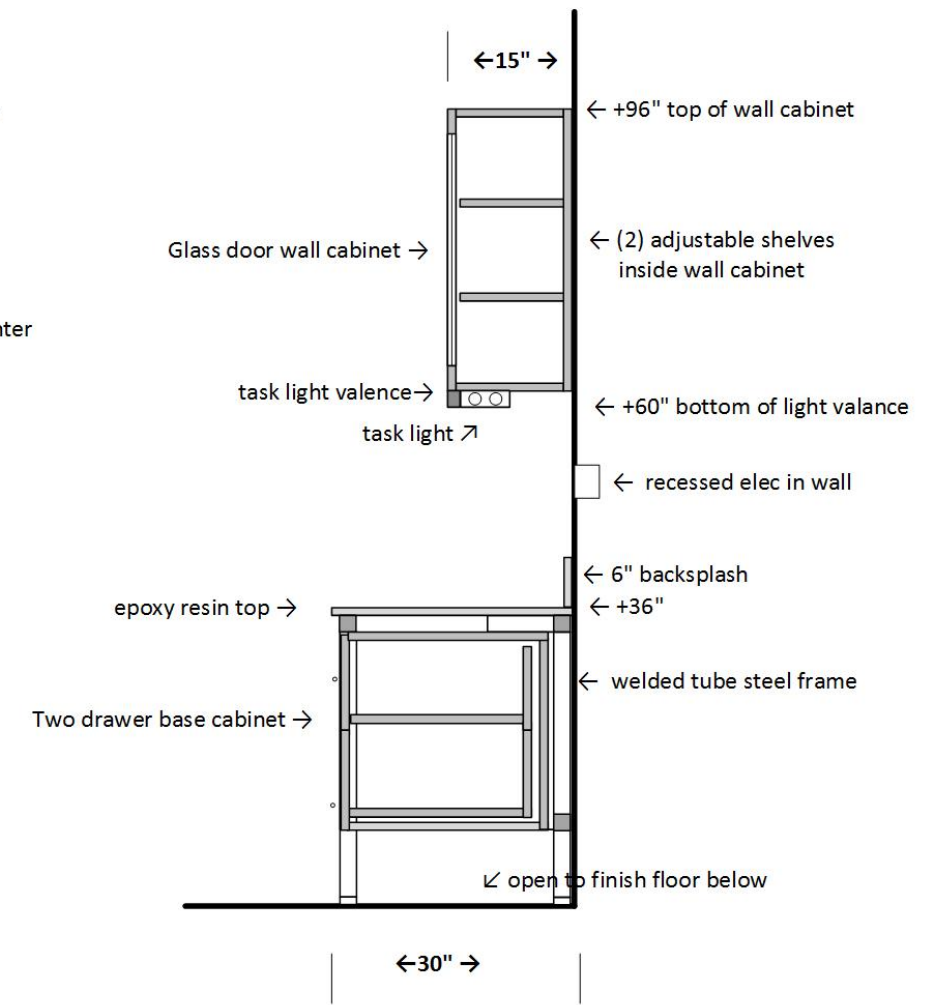
Sink Station- research labs



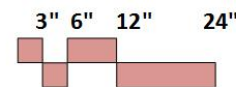
Elevation



Section at sink

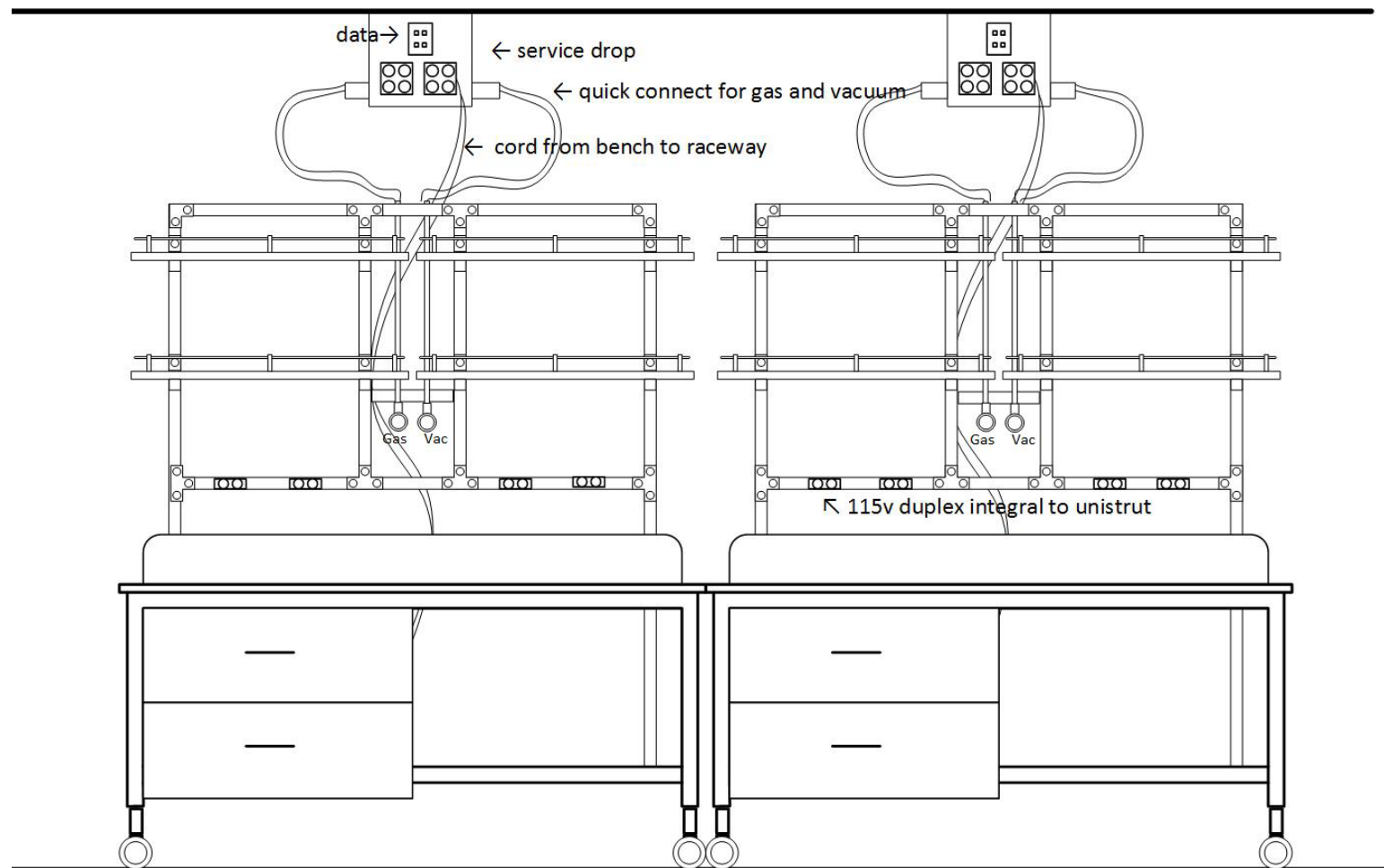


Section at wall cabinet

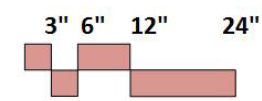
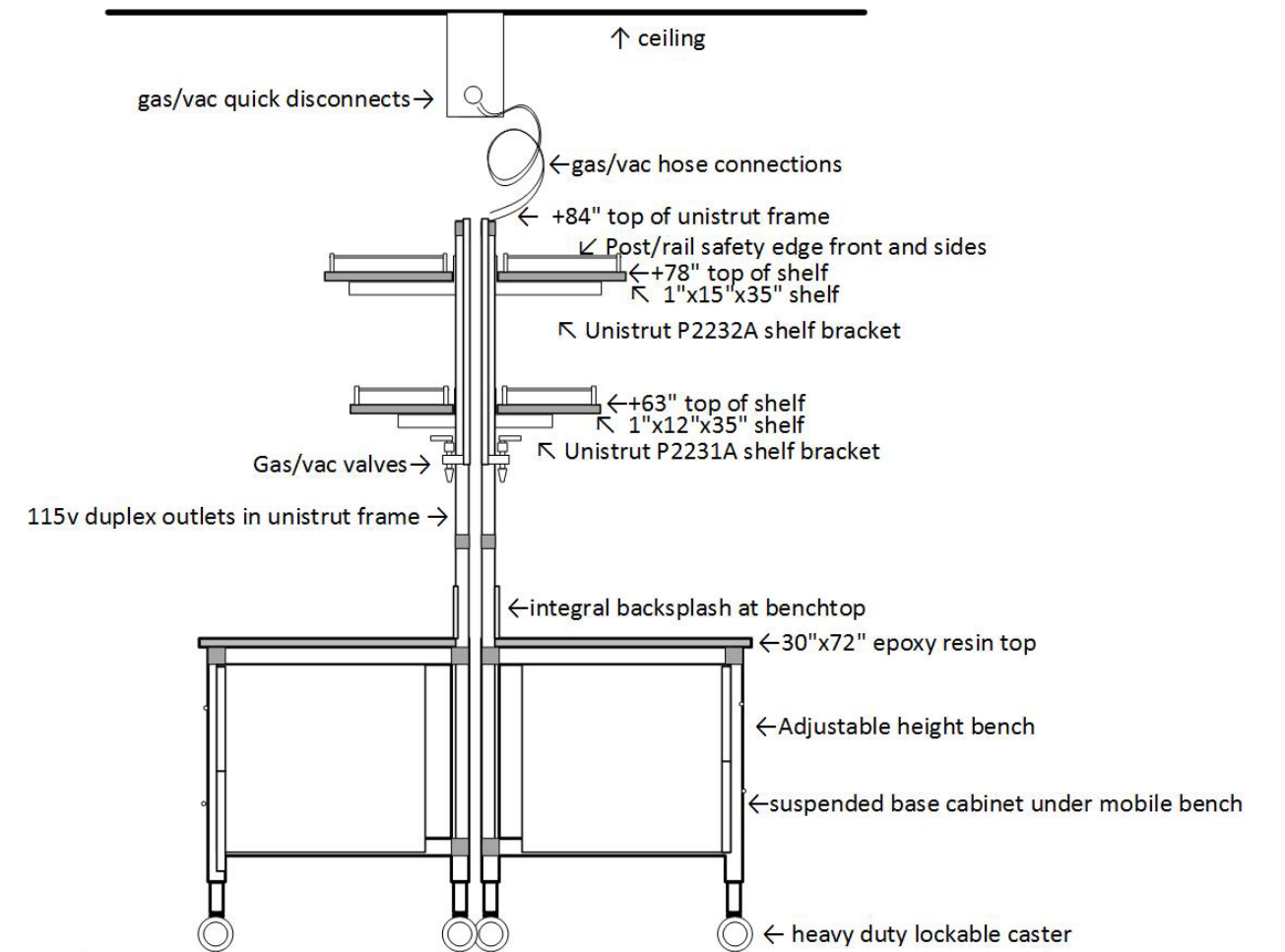


SECTION DETAIL #2

Flex Lab Bench- Non proprietary
 Proprietary system may be substituted, such as Kewaunee Enterprise

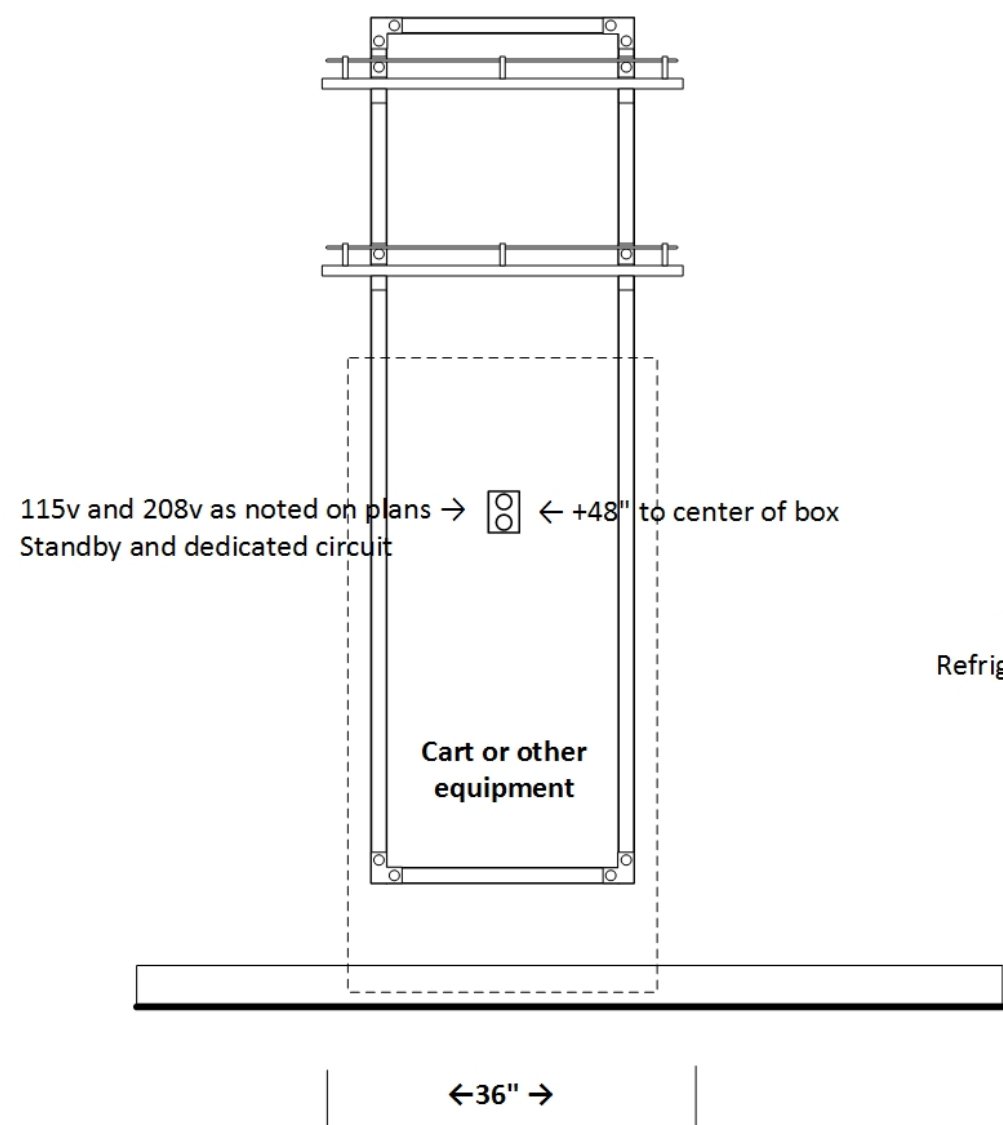


Elevation

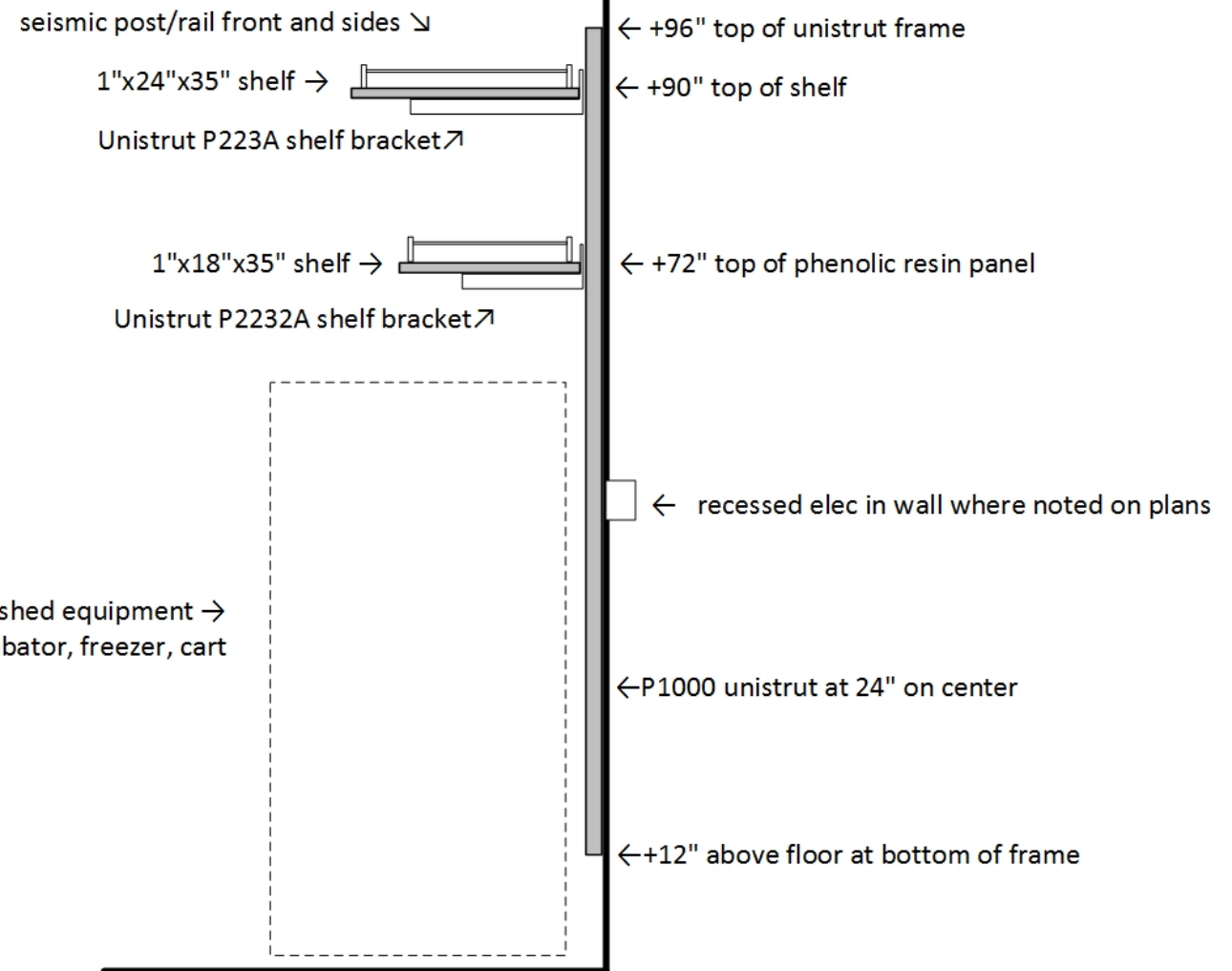


Section

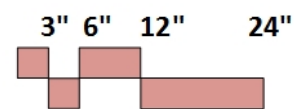
SECTION DETAIL #3 Equipment Space



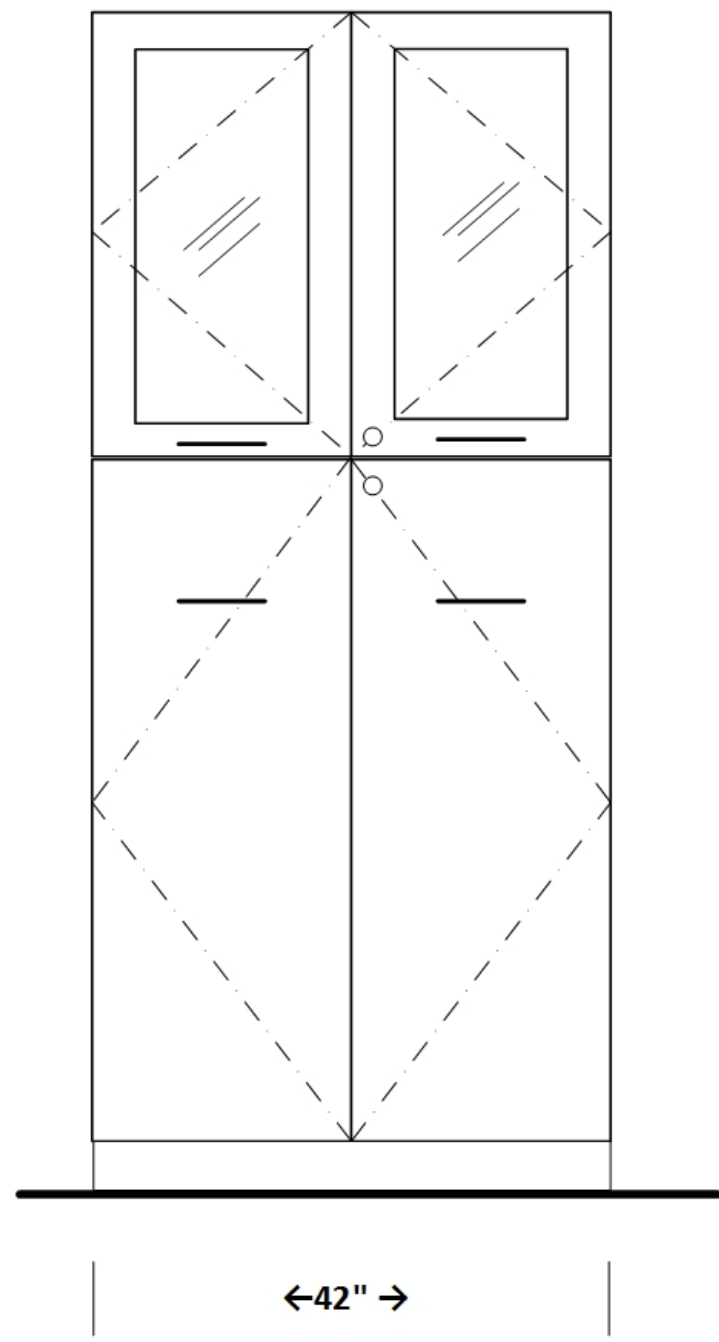
Elevation



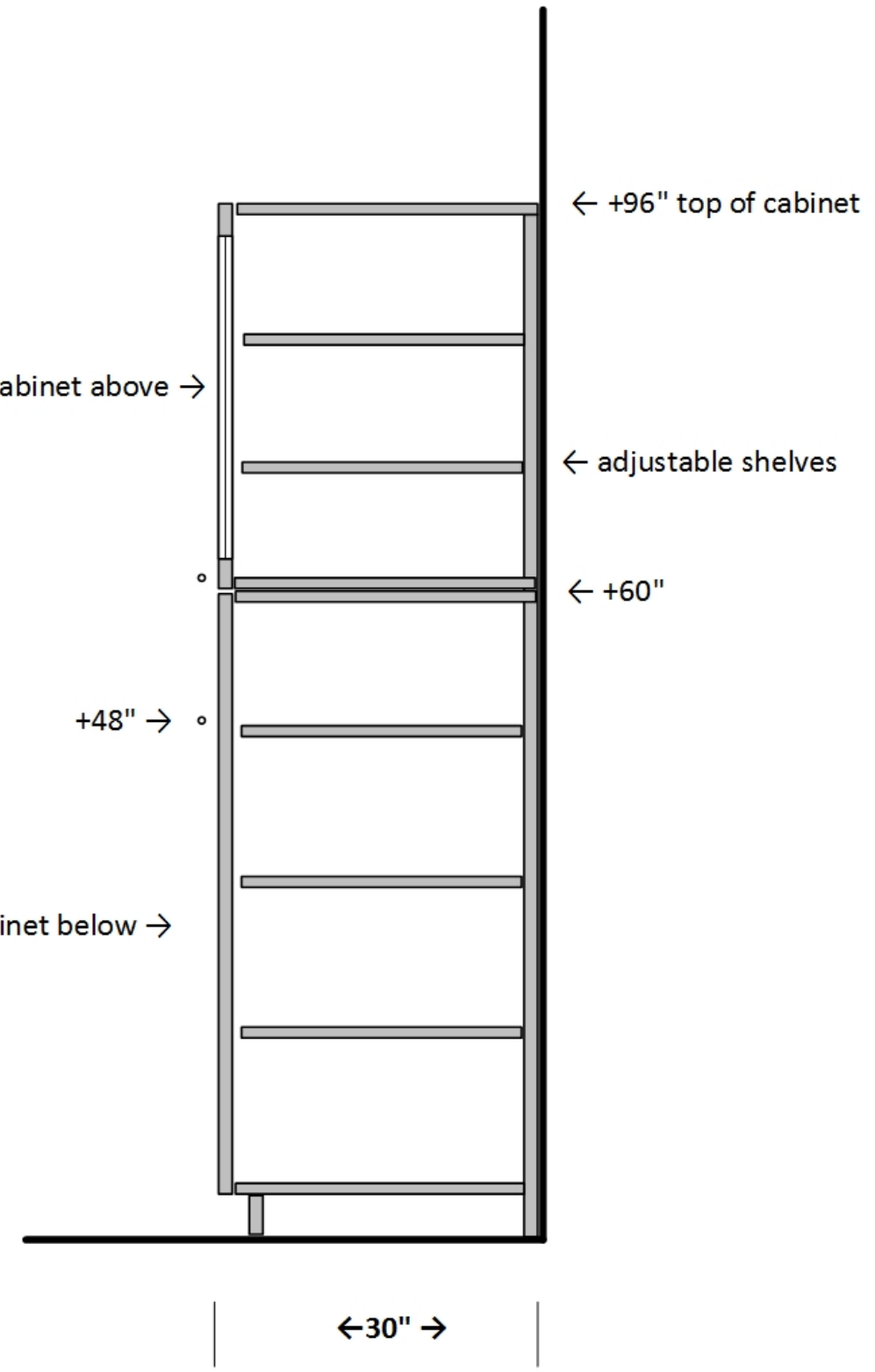
Section



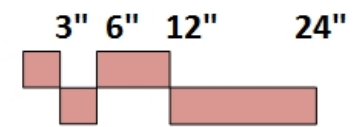
SECTION DETAIL #4
Tall Cabinet
Anatomy Lab



Elevation

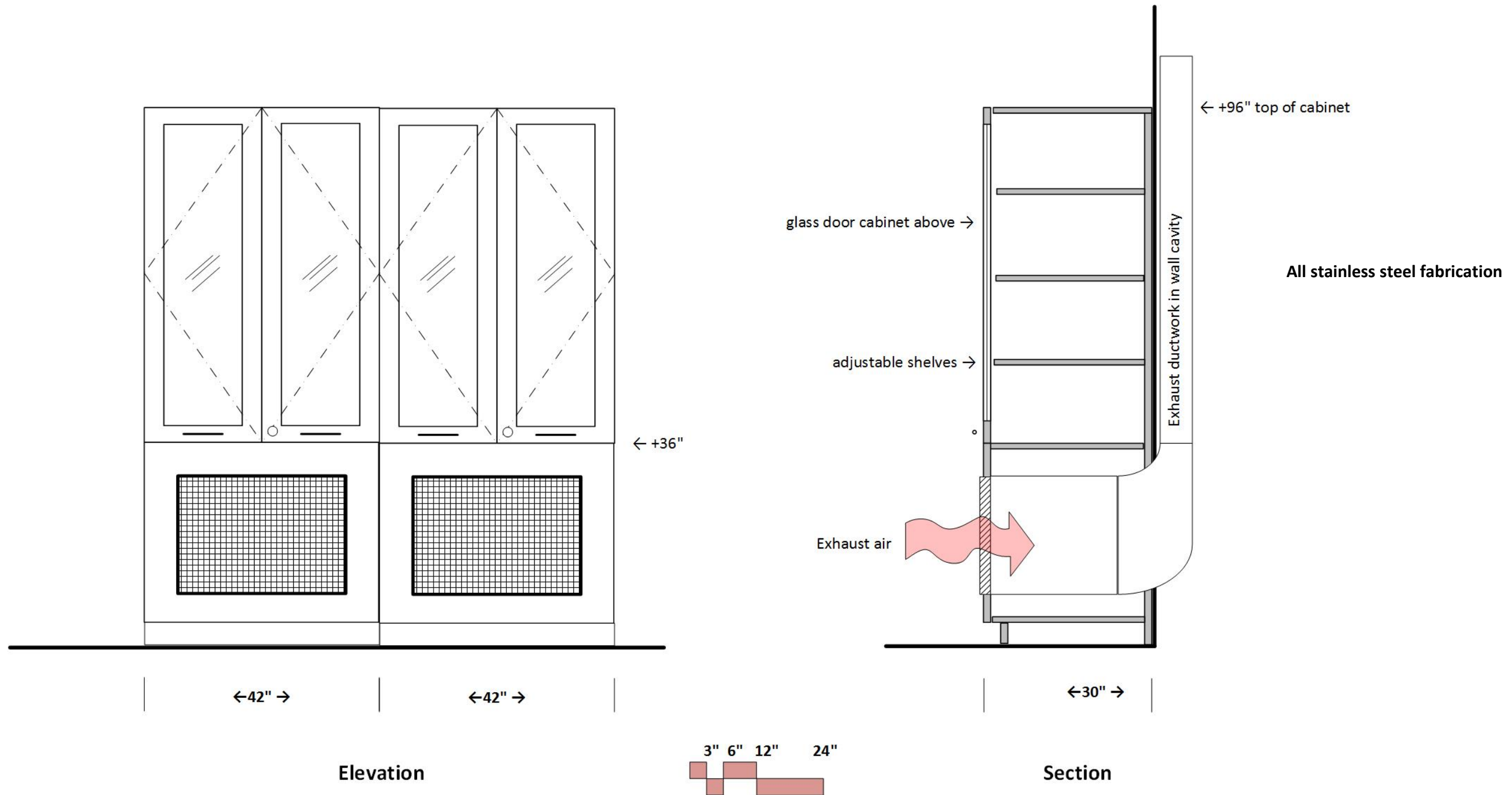


Section



All stainless steel fabrication

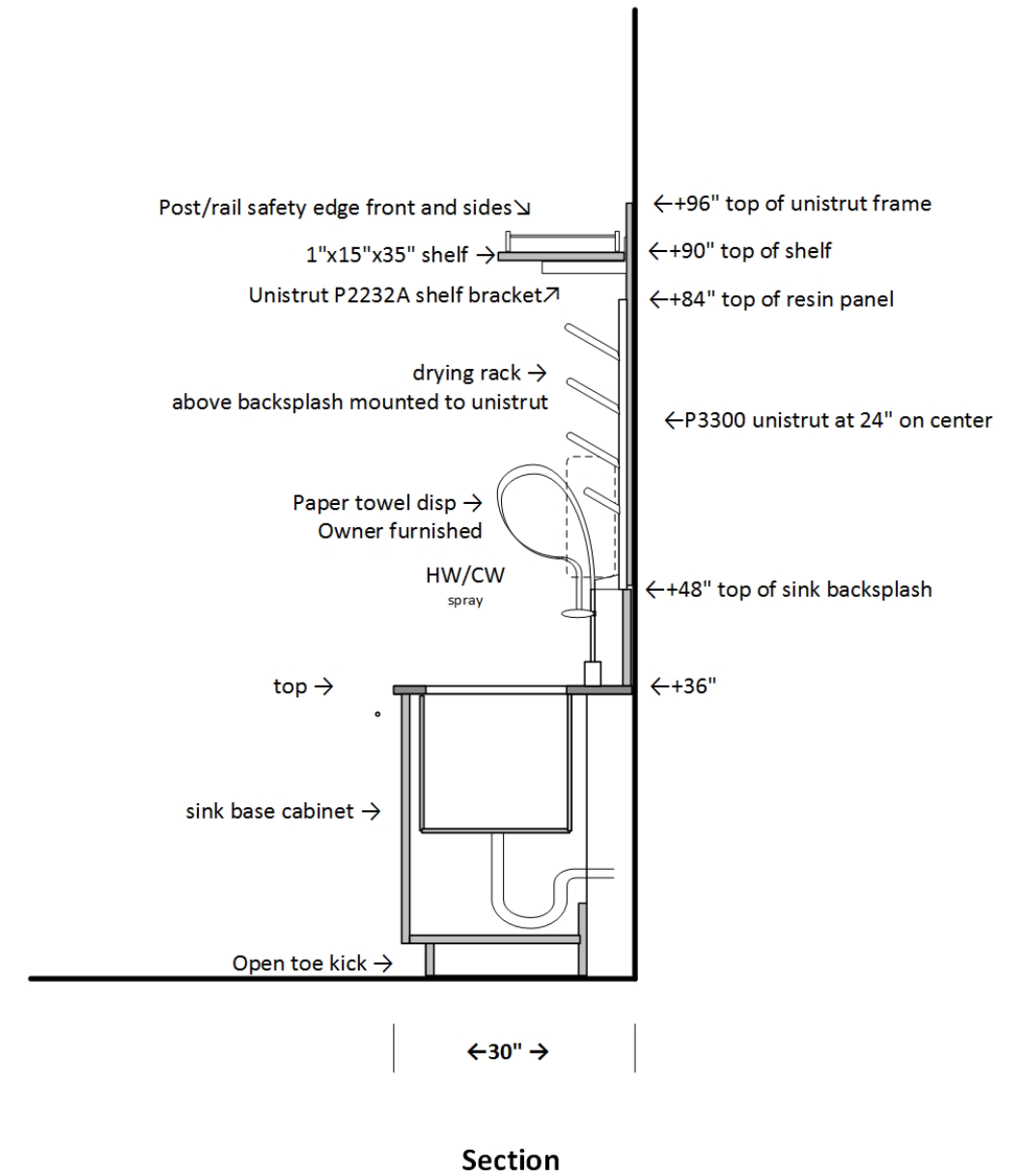
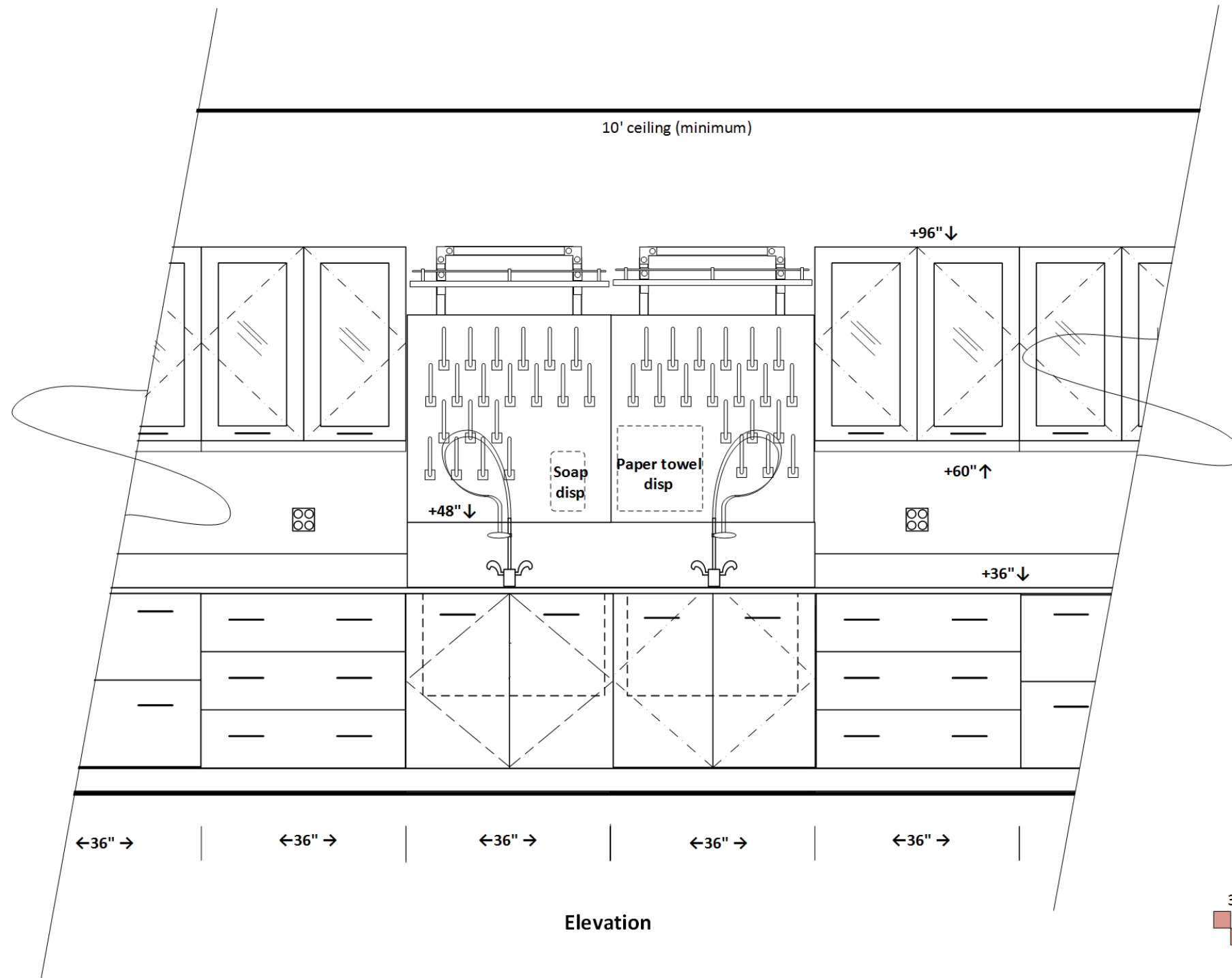
SECTION DETAIL #5
Tall Cabinet with low exhaust
Anatomy Lab



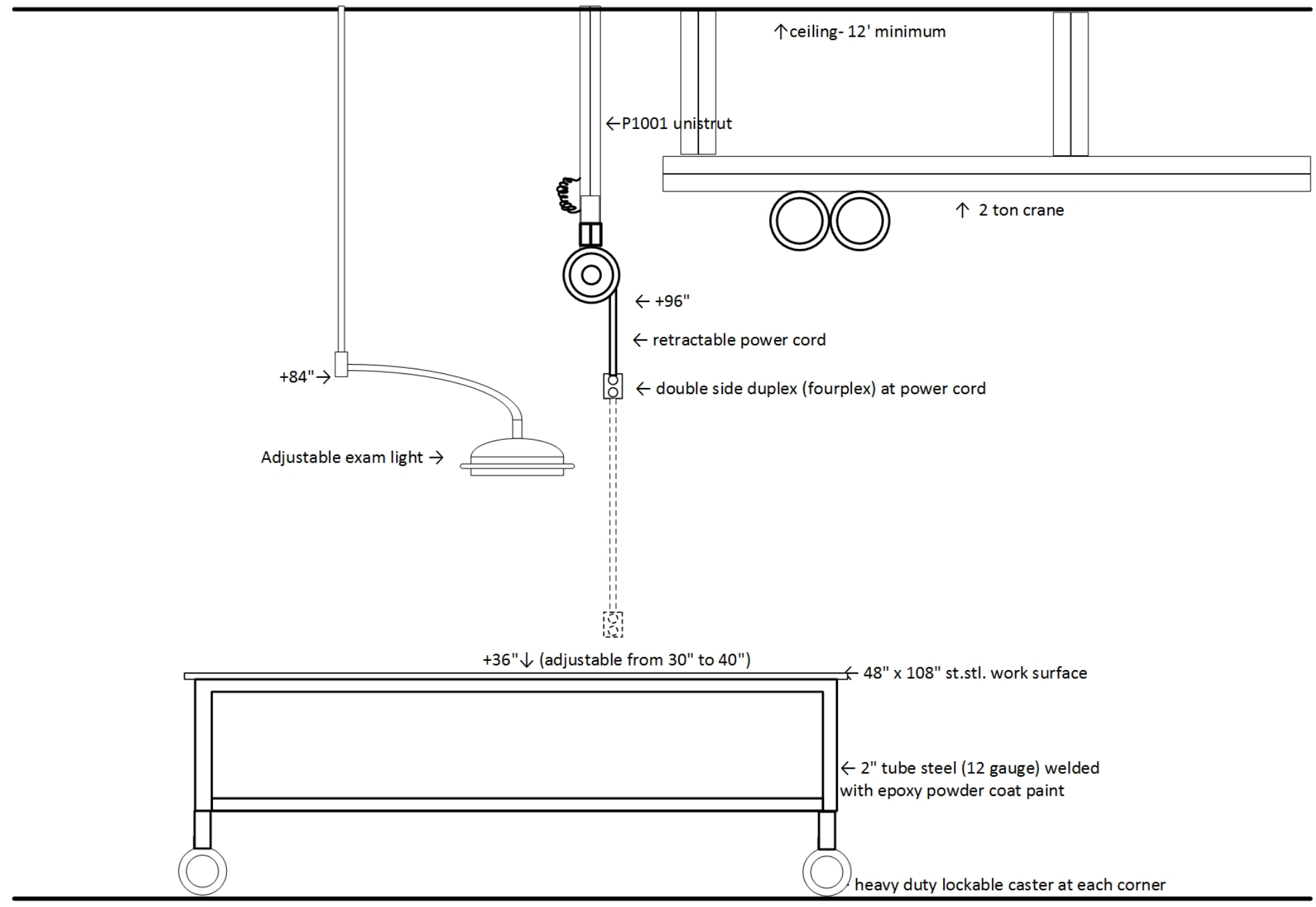
SECTION DETAIL #6

Double Sink

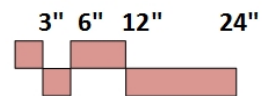
Autopsy Lab, Anatomy Lab



SECTION DETAIL #7
Autopsy table
Autopsy Lab



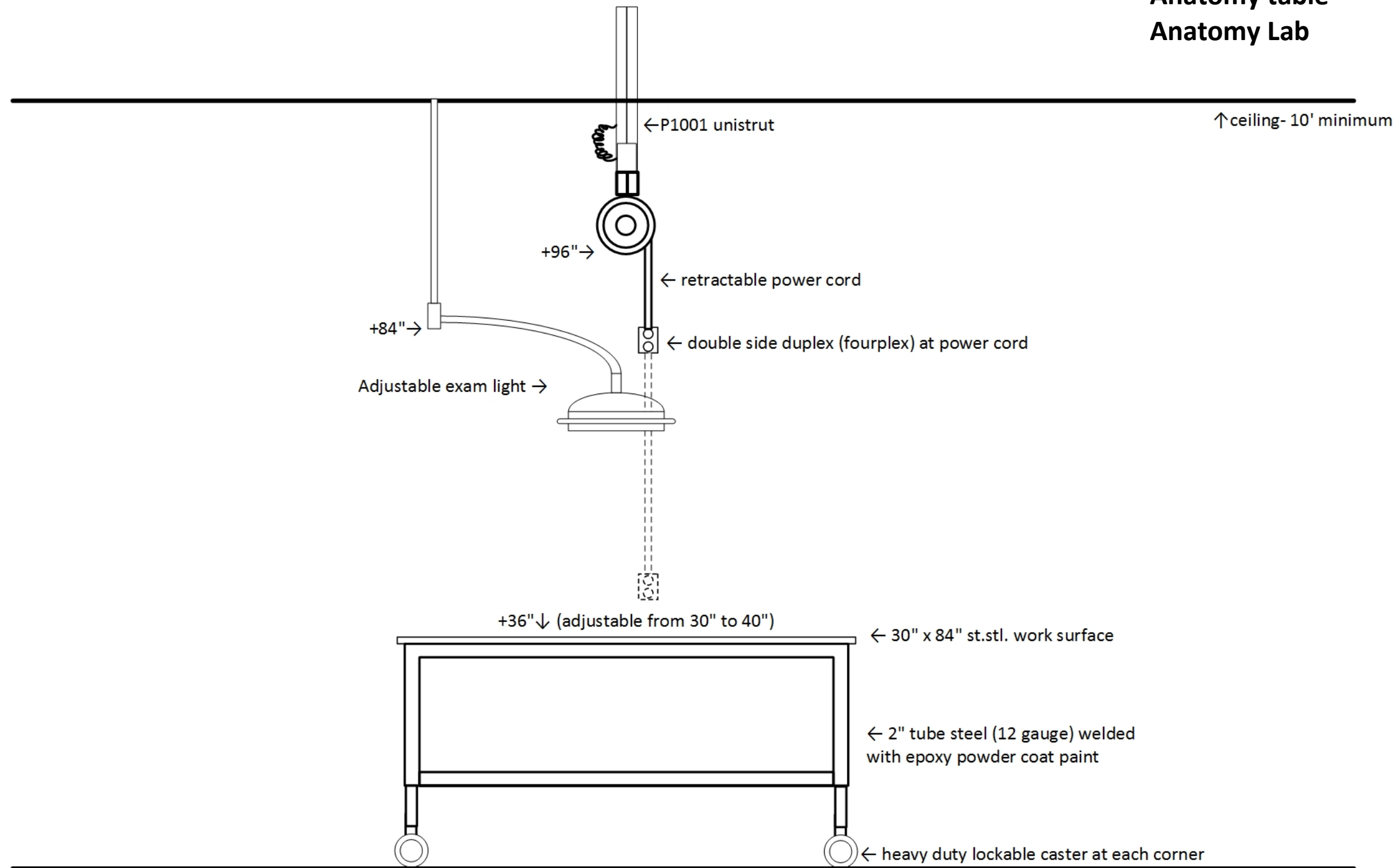
Elevation



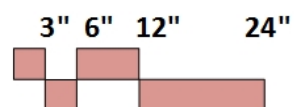
SECTION DETAIL #8

Anatomy table

Anatomy Lab



Elevation



PHOTOS OF FLEX BENCH SYSTEM

Advantages: adjustable height, moveable, adjustable



EQUIPMENT CUT SHEETS

FUME HOOD CUT SHEET

6' chem hood: 1200 cfm exhaust VAV

Protector[®] XStream[™] Laboratory Hoods



Protector XStream Laboratory Hood 9840600 is shown with SpillStopper Work Surface 9849800, Protector Acid Storage Cabinet 9901200 and Protector Standard Storage Cabinet 9900100. Blower, ductwork, work surface and base cabinets must be ordered separately.

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
1 pending

[‡] Heights of switches, electrical receptacle and service fixtures meet requirements of ADA.

[§] Exclusive Feature

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.

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"	330	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	\$1,200
8 feet	1060	0.12"	850	0.08"	640	0.04"	420	\$1,680

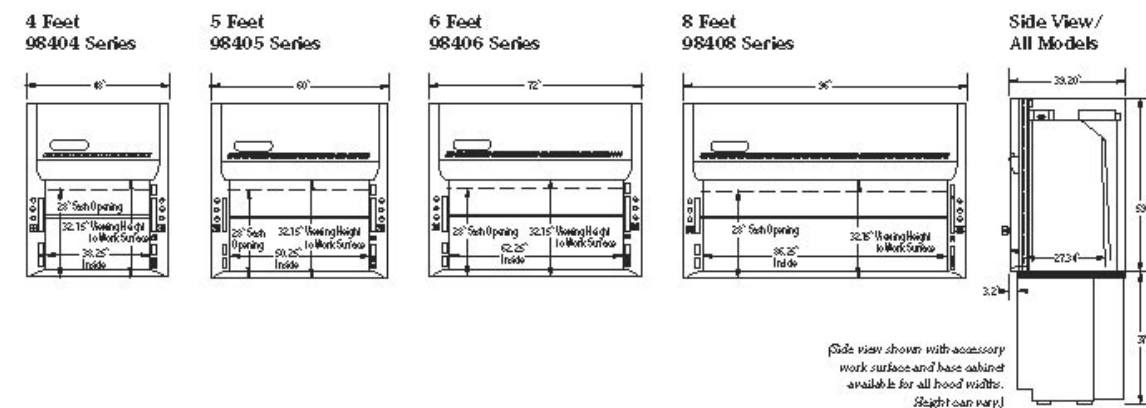
Total Exhaust CFM and Static Pressure @ 28" Sash Opening (100% open)

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"	530	0.13"	440	0.08"	290	\$1,160
5 feet	960	0.30"	770	0.19"	580	0.11"	380	\$1,520
6 feet	1180	0.36"	940	0.23"	710	0.13"	470	\$1,880
8 feet	1660	0.23"	1,330	0.18"	1000	0.10"	660	\$2,640

^{*}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



PURIFIER[®] AXIOM[™] CLASS II, TYPE C1 BIOSAFETY CABINETS

CATALOG NUMBER CONFIGURATOR

Use this key to configure the **nine digit catalog number** to order your Purifier Axiom Class II Biosafety Cabinet. For example, a 304411100 is a 4' Purifier Axiom Class II Biosafety Cabinet with 10" sash opening, service fixture, UV lamp, Vacu-Pass Portal, unassembled base stand and North America, 115 volt electrical receptacle and plug.

STEP 1: Select the **width** of your cabinet. This number is the fourth digit of your catalog number.

- 4 = 4' (Actual width = 54.3"/138 cm)
- 6 = 6' (Actual width = 78.3"/199 cm)

STEP 2: Select the **sash opening height**. This number is the fifth digit of your catalog number.

- 1 = 10" (25.4 cm)
- 8 = 8" (20.3 cm)



3 0 4

STEP 3: Select the **Accessory Package option:** service fixture(s), UV lamp and Vacu-Pass[™] Cord & Cable Portal. This number is the sixth digit of your catalog number.

- 0 = None
- 1 = Includes a right-side mounted factory-installed service fixture (two on 6' models, one on each side), UV lamp with timer, and right-side wall Vacu-Pass Portal.

STEP 4: Select **non-welded telescoping base stand option**. This number is the seventh digit of your catalog number.

- 0 = None
- 1 = Includes an non-welded telescoping base stand shipped with the cabinet.

STEP 5: Select the **electrical receptacle and plug type**. This number is the eighth and ninth digits of your catalog number.

- 00 = North America, 115 volts, 20 amps
- 10 = North America, 230 volts
- 20 = Japan, 100 volts, 20 amps
- 30 = Schuko, 230 volts
- 40 = China/Australia, 230 volts
- 50 = British (UK), 230 volts
- 70 = India, 230 volts

Technical Specifications

Nominal Width	4'	6'
Actual Width	54.2" (138 cm)	78.2" (199 cm)
Depth	32.0" (81 cm)	32.6" (83 cm)
Height	68.9" (175 cm)	68.9" (175 cm)
Shipping Weight (Cabinet only)	750 lbs. (340 kg)	1075 lbs. (488 kg)
Shipping Weight (Cabinet with Base Stand)	835 lbs. (379 kg)	1175 lbs. (533 kg)
Power Consumption	200 watts	325 watts
Exhaust Volume, 10" Sash Opening	480 CFM @ 0.3" s.p.	684 CFM @ 0.3" s.p.
Exhaust Volume, 8" Sash Opening	387 CFM @ 0.3" s.p.	556 CFM @ 0.3" s.p.



LABCONCO CORPORATION • 8811 Prospect Avenue • Kansas City, MO 64132
 800-821-5525 • 816-333-8811 • BSCno-brainer.com
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2-17-9/29/14-James-1.3M

BIOLOGICAL SAFETY CABINET CUT SHEET

Use C1 type for B2 cabinet; 500 cfm at 4' BSC; 700 cfm at 6' BSC

PURIFIER[®] AXIOM[™] CLASS II, TYPE C1 BIOSAFETY CABINETS

SPECIFICATIONS

Performance Features

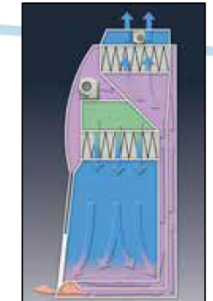
- NEW** **Omni-Flex[™]** two operation mode design: Type A mode for standard microbiological use and Type B mode for connection to exhaust system when handling hazardous chemical vapors or radionuclides
- NEW** **Dual Electronically Commutated Motors (ECM)**
- Constant Airflow Profile[™] (CAP)** Technology airflow monitoring system that provides constant and precise volume of air as required and automatically adjusts as filter load without relying on airflow or pressure sensors
- Low static pressure and volumetric rate exhaust requirements** when in Type B mode. No dedicated exhaust system per BSC required as compared to contemporary Class II, Type B biosafety cabinets.
- Air-Wave[™] Entry System***
- Contain-Air[™] Negative Pressure Channel***
- MyLogic[™] Operating System** that controls Smart-Start[™] System for allowing the user to program start up and shut down operations and Night-Smart[™] System for idling the blower when the sash is fully closed (Night-Smart operational in Type A mode only)
- Built-in interval or elapsed timer** for experiment monitoring, fluorescent light or UV light control (on models with UV light)
- Digital clock**
- Bright, 90-150 footcandle, glare-free fluorescent lighting** located outside the contaminated work area
- Five year warranty**

Safety Features

- LCD information center** with "Filter Life Remaining" bar graph for each HEPA filter, status line for alarm conditions and alerts to warn when filter life diminishes to 20% and 0%
- NEW** **Active Protection Protocol** that maintains negative pressure ensuring user safety during normal shut down and building exhaust failure (when connected to exhaust in Type B mode).**
- Electronic security lock** (optional activation) that requires code to operate the cabinet
- Two electrical duplex receptacles**, (single outlets on 230 volt models), located one on each side (GFCI on 115 volt models only)
- Intrinsically safe negative pressure design**
- Fully-closing, clear 1/4" tempered safety glass sash**
- Stainless steel inlet grille with Reserve-Air[™] Secondary Airflow Slots***
- Supply and exhaust 99.99% efficient HEPA filters.** Contact Labconco for optional 99.999% efficient ULPA filters.
- Leak-tight stainless steel interior**

Comfort Features

- Interior-mounted, line-of-sight, full color LCD information center** with easy-to-understand MyLogic[™] programming
- NEW** **22.6" (58 cm) maximum sash opening height** and 27.0" (69 cm) viewing height
- Waterfall design curved inlet grille forearm support***



Side View: Airflow Diagram

- NEW** **Removable, type 304 stainless steel 3-piece work surface** (including 2 flat sides and 1 dished center) with lift out knobs and clearly delineated working area (when handling chemicals)**
- NEW** **Latch to hold center dished Chem-Zone[™] work surface** in upright position for easy cleaning of catch pan and sump area
- 10° Angled sash** with counterbalanced, anti-racking mechanism for ease of lifting
- ADA-compliant touchpad control** on right-hand side post for manual activation of blower, light(s), timer, electrical receptacles, audible alarm mute and menu selection
- Flush-mounted stainless steel electrical receptacle covers** with dampened hinges
- NEW** **Two operational ADA-compliant sash heights.** BSC can be programmed on location to have either 8" or 10" sash height.

Specifications

- NEW** **Chem-Zone[™] work area** with dedicated direct exhaust for use with hazardous vapors or radionuclides**
- Nominal inflow velocity** of 105 feet per minute (fpm) (0.53 m/sec)
- Nominal downflow velocity** of 65 fpm (0.33 m/sec)
- Powder-coated steel exterior**
- NSF International-Listed¹ and modified ASHRAE 110 compliant**
- ETL listed¹**
- CE conformity marking¹** (230 volt models)
- Class 5 conditions per ISO 14644-1 and -2** (formerly Class 100)

Options

- Unassembled, NSF-Approved, powder-coated steel telescoping base stand** with fixed feet
- Accessory Package:** 254 nm UV lamp, ADA-compliant service fixture(s) with ball-type valve(s), and NSF-Approved Vacu-Pass[™] Cord & Cable Portal
- 10" diameter stainless steel air-tight manual damper** (recommended if connected to exhaust in Type B mode)
- Bag-In Bag-Out Exhaust Filter** for use with radionuclides or harmful pharmaceutical compounding ingredients

Required Accessory

- Supporting base** if unassembled stand option is not selected



¹U.S. Patent No. 6,368,206

**Patent pending

¹Pending

Exclusive Labconco feature

Complies with Americans with Disabilities Act Standard for height of controls and receptacles

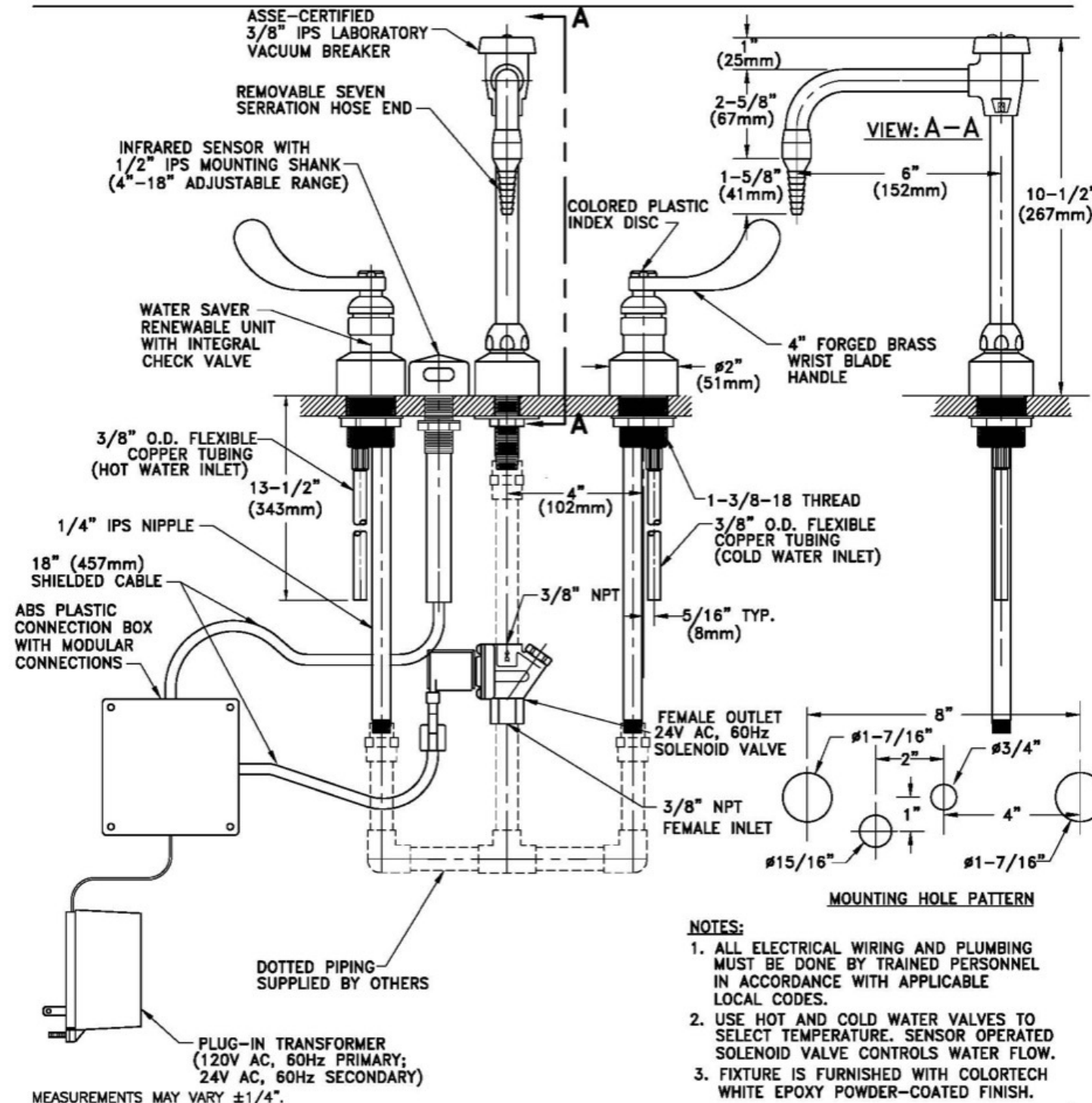
Laboratory Service Fixtures by
WaterSaver Faucet Co.

CT4554VB-BH

DECK MOUNTED SENSOR OPERATED AUTOMATIC MIXING FAUCET WITH 6" RIGID VACUUM BREAKER
GOOSENECK, WRIST BLADE HANDLES. AND MANUALLY OPERATED MIXING VALVES

HOT/COLD WATER FAUCET CUT SHEET with infrared hands free sensor

requires 120v outlet below sink



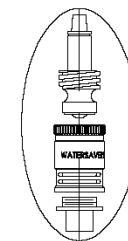
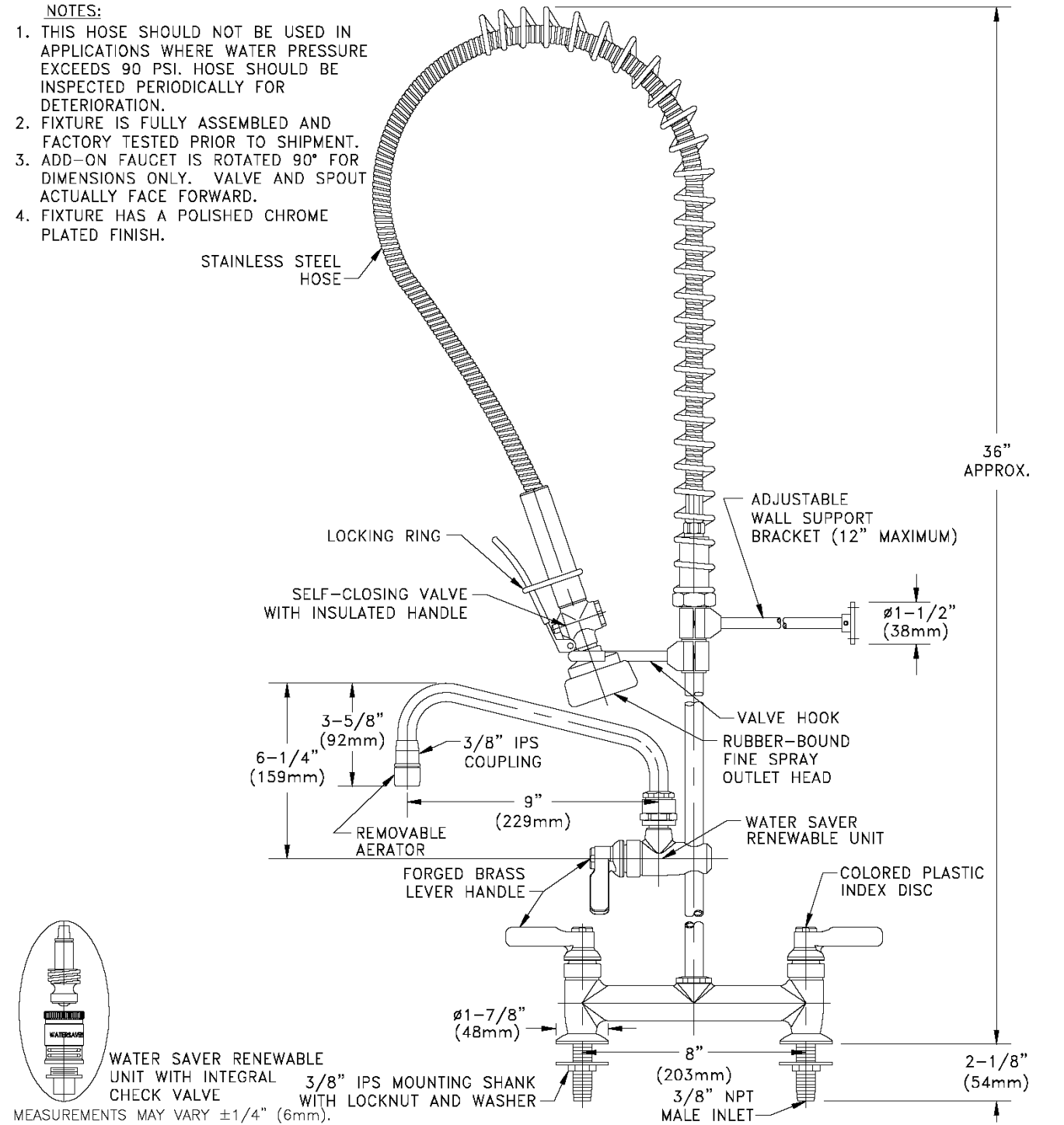
Drawing Number: _____

Revision Number: 030806-KJS

PR1511AOF-LE-WSA
PRE-RINSE UNIT, HOT AND COLD WATER, DECK MOUNTED, ADD-ON FAUCET, 9" SWING SPOUT,
LEVER HANDLES

NOTES:

1. THIS HOSE SHOULD NOT BE USED IN APPLICATIONS WHERE WATER PRESSURE EXCEEDS 90 PSI. HOSE SHOULD BE INSPECTED PERIODICALLY FOR DETERIORATION.
2. FIXTURE IS FULLY ASSEMBLED AND FACTORY TESTED PRIOR TO SHIPMENT.
3. ADD-ON FAUCET IS ROTATED 90° FOR DIMENSIONS ONLY. VALVE AND SPOUT ACTUALLY FACE FORWARD.
4. FIXTURE HAS A POLISHED CHROME PLATED FINISH.



WATER SAVER RENEWABLE UNIT WITH INTEGRAL CHECK VALVE
MEASUREMENTS MAY VARY $\pm 1/4"$ (6mm).

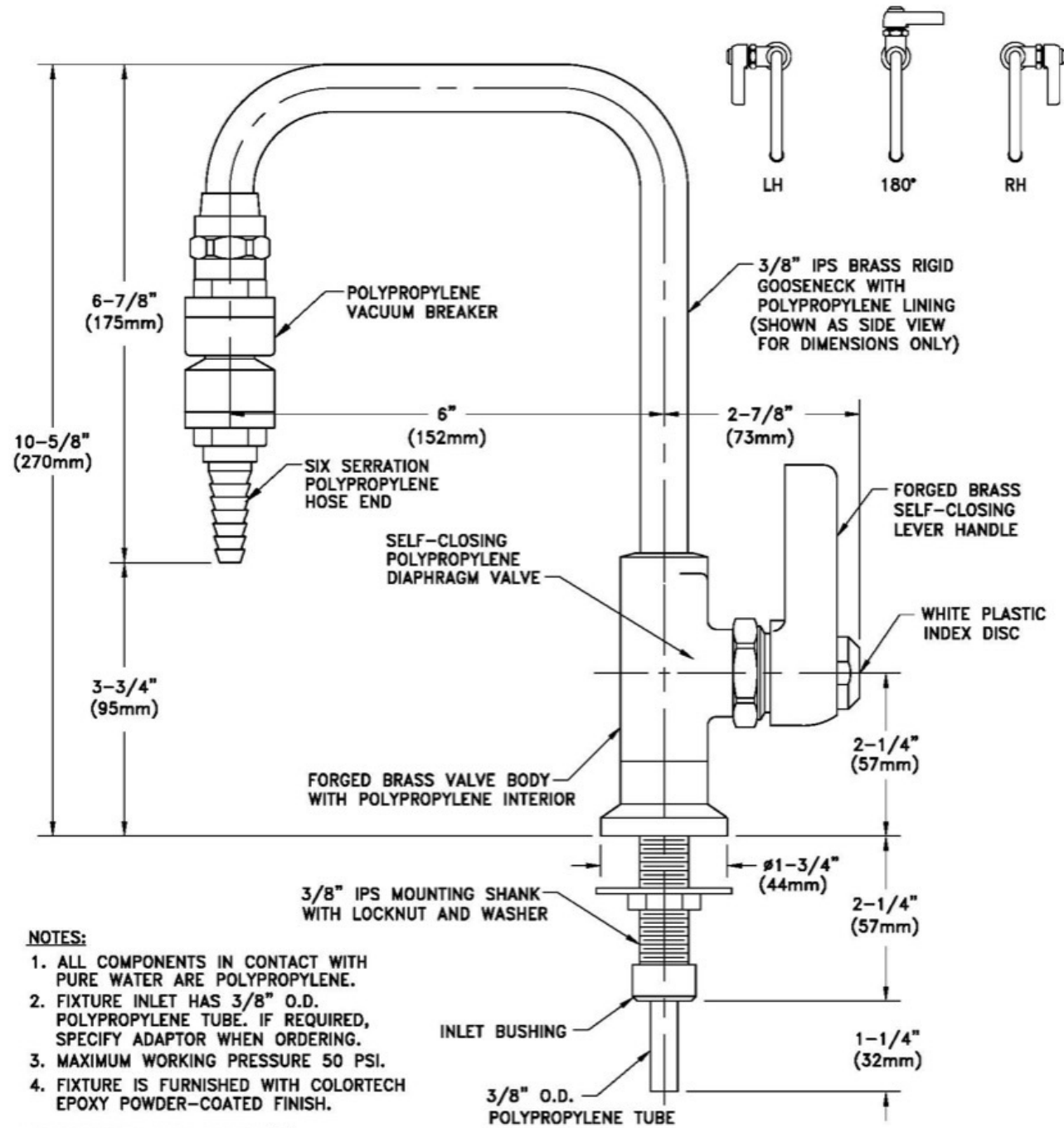
Drawing Number: _____

Revision Number: 042213-TEC

Laboratory Service Fixtures by
WaterSaver Faucet Co.

CT7853SC-7110-LE

DECK MOUNTED FIXTURE FOR DISTILLED, DEIONIZED AND ULTRA-PURE WATER WITH ALL-POLYPROPYLENE INTERIOR LINING, 6" RIGID GOOSENECK, SELF-CLOSING OPERATION, POLYPROPYLENE VACUUM BREAKER AND LEVER HANDLE



Drawing Number: _____

Revision Number: 090497-WK

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

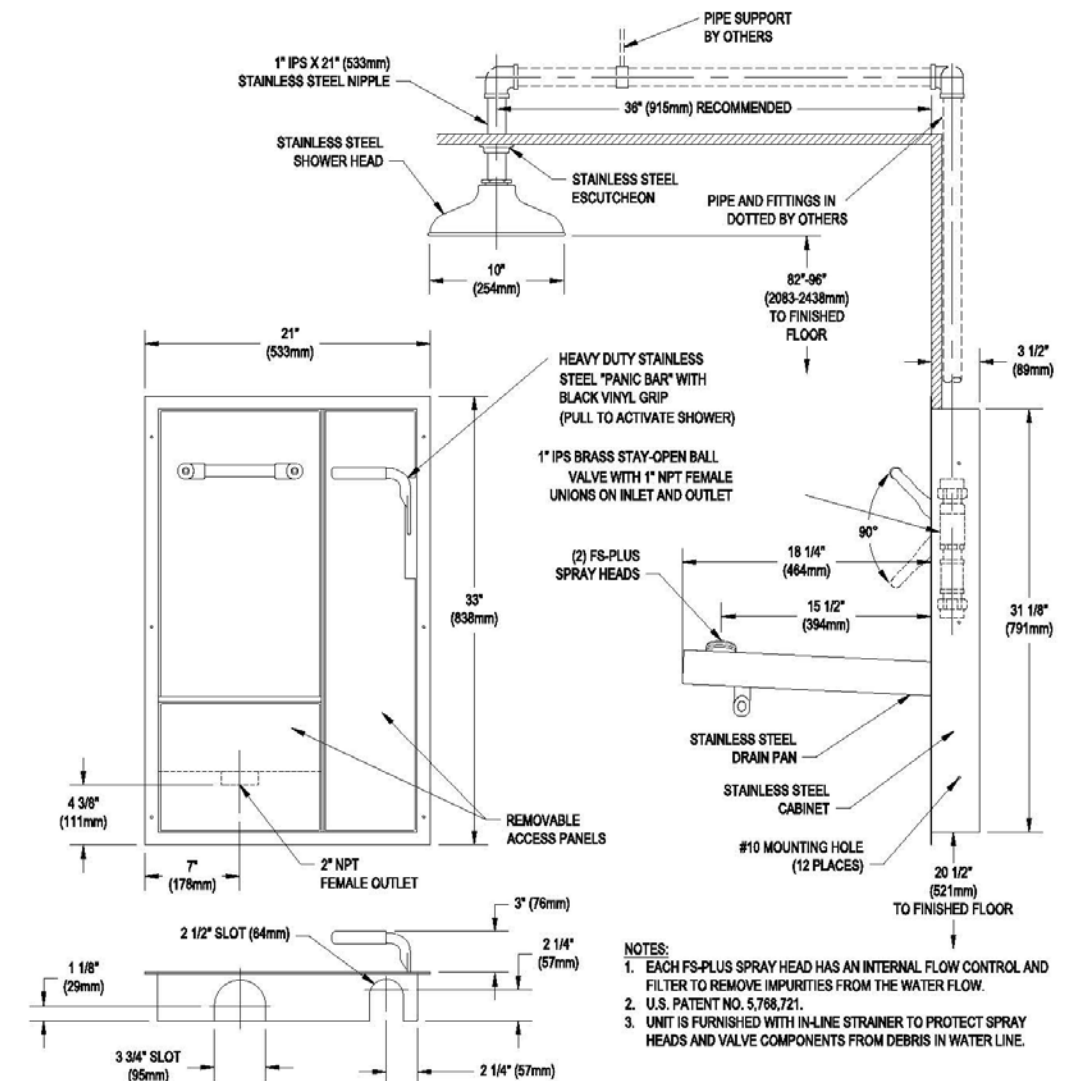
- PCC** Polished chrome plated brass shower supply nipple.
- AP250-065** Modesty Curtain
- AP280-235** Electric Light and Alarm Horn
- TMV** AP3800 thermostatic mixing valve.



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



WaterSaver 312 666 5500 TELEPHONE
701 W Erie St 312 666 5501 FACSIMILE
Chicago, IL 60654 wsflab.com



Listed 8116. Units have been tested to and comply with ANSI Z358.1-2014 and the Uniform Plumbing Code.



ETL Listed 101496. Units have been tested to and comply with ANSI Z358.1-2014.



WaterSaver 312 666 5500 TELEPHONE
701 W Erie St 312 666 5501 FACSIMILE
Chicago, IL 60654 wsflab.com



Listed 8116. Units have been tested to and comply with ANSI Z358.1-2014 and the Uniform Plumbing Code.



ETL Listed 101496. Units have been tested to and comply with ANSI Z358.1-2014.





Item # _____
 Job _____

SUPER ADJUSTABLE 2" SUPER ERECTA SHELF® WIRE SHELVING

Super Adjustable 2" Super Erecta Wire Shelving is the most advanced and innovative wire storage system available. The unique Corner Release System, which allows shelves to be adjusted quickly and easily without tools, has been re-engineered to provide increased rigidity. And Super Adjustable 2" Shelving works in conjunction with the entire Super Erecta System of shelves and accessories.

- **Maximum Space Utilization:** The Corner Release System encourages repositioning of shelves during initial assembly to reclaim wasted vertical space. In some cases, reclaimed vertical space will allow an extra shelving tier to be added to the storage unit resulting in a 25% increase in storage capacity!
- **Easily Assembled:** The unique Corner Release System enables quick and easy repositioning of shelves during the initial setup to accommodate different package or container sizes. "Total Assembly" is complete only after the shelves are properly spaced to maximize storage. SiteSelect™ Posts, with the double-groove visual guide feature, have circular grooves at 1" (25mm) increments and are numbered at 2" (51mm) intervals to easily identify proper shelf locations.
- **Easily Adjustable:** The unique shelf design and SiteSelect™ Posts enable "tool-free", quick adjustment at 1" (25mm) increments along the entire height of the post.
- **Improved Rigidity:** An enhanced Corner Release System has made Super Adjustable 2" the most rigid, easily adjustable shelving system ever.
- **Strong:** Super Adjustable 2" shelves hold as much weight as traditional Super Erecta wire shelving. Stationary units hold a maximum of 2,000 lb. (910kg). Maximum weight capacity per shelf (48" [1219mm] or shorter = 800 lb. [364kg]; longer than 48" [1219mm] = 600 lb. [273kg]).
- **Choice of Finishes:** Super Adjustable 2" Super Erecta shelving is available in a variety of finishes: Super Erecta Brite and chrome-plated for dry storage; Metroseal 3™ with antimicrobial product protection and stainless steel for corrosive environments; and attractive black epoxy for merchandising applications.

Super Adjustable 2" Advantage . . .

Easily reposition Super Adjustable 2" shelves during initial assembly to increase storage capacity by as much as 25%.



Corner Release System

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban Products Company, Huntersville, NC.



InterMetro Industries Corporation
 North Washington Street
 Wilkes-Barre, PA 18705
 www.metro.com



Dry Storage — Chrome or Super Erecta Brite™



All Environments — Metroseal 3™ with *Microban® Antimicrobial Product Protection



Mobile Stem Caster Cart



Mobile Dolly Truck

10.01A SUPER ADJUSTABLE 2" SUPER ERECTA SHELF® Adjustable Wire Shelving

10.01A

SUPER ADJUSTABLE 2" SUPER ERECTA SHELF® Adjustable Wire Shelving

10.01A



METRO SHELF UNIT CUT SHEET



SUPER ADJUSTABLE 2" SUPER ERECTA SHELF® WIRE SHELVING

Dimensions

Super Adjustable 2" Super Erecta Wire Shelving

Cat. No. Super Erecta Brite	Cat. No. Chrome	Cat. No. Metroseal 3	Cat. No. Stainless	Cat. No. Black	Shelf Width/Length (in.)	Shelf Width/Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
A1424BR	A1424NC	A1424NK3	A1424NS	A1424NBL	14x24	355x610	6	2.7
A1430BR	A1430NC	A1430NK3	A1430NS	A1430NBL	14x30	355x760	7	3.2
A1436BR	A1436NC	A1436NK3	A1436NS	A1436NBL	14x36	355x914	8	3.6
A1442BR	A1442NC	A1442NK3	A1442NS	A1442NBL	14x42	355x1066	9 1/2	4.3
A1448BR	A1448NC	A1448NK3	A1448NS	A1448NBL	14x48	355x1219	10 1/2	4.7
A1460BR	A1460NC	A1460NK3	A1460NS	A1460NBL	14x60	355x1524	14	6.3
A1472BR	A1472NC	A1472NK3	A1472NS	A1472NBL	14x72	355x1825	17	7.7
A1824BR	A1824NC	A1824NK3	A1824NS	A1824NBL	18x24	457x610	7	3.2
A1830BR	A1830NC	A1830NK3	A1830NS	A1830NBL	18x30	457x760	8	3.6
A1836BR	A1836NC	A1836NK3	A1836NS	A1836NBL	18x36	457x914	9 1/2	4.3
A1842BR	A1842NC	A1842NK3	A1842NS	A1842NBL	18x42	457x1066	11	5.0
A1848BR	A1848NC	A1848NK3	A1848NS	A1848NBL	18x48	457x1219	12	5.4
A1854BR	A1854NC	A1854NK3	A1854NS	A1854NBL	18x54	457x1370	14 1/2	6.6
A1860BR	A1860NC	A1860NK3	A1860NS	A1860NBL	18x60	457x1524	17	7.7
A1872BR	A1872NC	A1872NK3	A1872NS	A1872NBL	18x72	457x1825	20	9.1
A2124BR	A2124NC	A2124NK3	A2124NS	A2124NBL	21x24	530x610	8	3.6
A2130BR	A2130NC	A2130NK3	A2130NS	A2130NBL	21x30	530x760	9	4.1
A2136BR	A2136NC	A2136NK3	A2136NS	A2136NBL	21x36	530x914	11	5.0
A2142BR	A2142NC	A2142NK3	A2142NS	A2142NBL	21x42	530x1066	12	5.4
A2148BR	A2148NC	A2148NK3	A2148NS	A2148NBL	21x48	530x1219	14	6.4
A2154BR	A2154NC	A2154NK3	A2154NS	A2154NBL	21x54	530x1370	16	7.3
A2160BR	A2160NC	A2160NK3	A2160NS	A2160NBL	21x60	530x1524	18	8.2
A2172BR	A2172NC	A2172NK3	A2172NS	A2172NBL	21x72	530x1825	24	10.9
A2424BR	A2424NC	A2424NK3	A2424NS	A2424NBL	24x24	610x610	9	4.1
A2430BR	A2430NC	A2430NK3	A2430NS	A2430NBL	24x30	610x760	11	5.0
A2436BR	A2436NC	A2436NK3	A2436NS	A2436NBL	24x36	610x914	13	5.9
A2442BR	A2442NC	A2442NK3	A2442NS	A2442NBL	24x42	610x1066	15	6.8
A2448BR	A2448NC	A2448NK3	A2448NS	A2448NBL	24x48	610x1219	16	7.3
A2454BR	A2454NC	A2454NK3	A2454NS	A2454NBL	24x54	610x1370	18	8.6
A2460BR	A2460NC	A2460NK3	A2460NS	A2460NBL	24x60	610x1524	21	9.5
A2472BR	A2472NC	A2472NK3	A2472NS	A2472NBL	24x72	610x1825	26	11.8
A3036NC	A3036NK3	A3036NS			30x36	760x914	15	6.8
A3048NC	A3048NK3	A3048NS			30x48	760x1219	21	9.5
A3060NC	A3060NK3	A3060NS			30x60	760x1524	26 1/2	11.8
A3072NC	A3072NK3	A3072NS			30x72	760x1825	31	14.0
A3636NC	A3636NK3	A3636NS			36x36	910x914	18	8.2
A3648NC	A3648NK3	A3648NS			36x48	910x1219	23	10.4
A3660NC	A3660NK3	A3660NS			36x60	910x1524	29	13.1
A3672NC	A3672NK3	A3672NS			36x72	910x1825	34 1/2	15.4

NOTE: MICROBAN® protects the Metroseal 3 coating from bacteria, mold, mildew and fungi that cause odors, stains and product degradation. For Metroseal 3 shelving information see sheet #10.10A.

SiteSelect™ Posts

Height* (in.)	Cat. No. Plated	STATIONARY			MOBILE†			Approx. Pkd. Wt. (lbs.) (kg)
		Cat. No. Metroseal 3	Cat. No. Stainless	Cat. No. Black	Cat. No. Metroseal 3	Cat. No. Stainless	Cat. No. Black	
7 1/2	191	7P		7PBL				1/2 0.3
14 1/2	370	13P	13PK3	13PS	13PBL			1 0.5
27 1/2	700	27P		27PS	27PBL	27 1/2 699	27UP	1 1/4 0.75
34 1/2	875	33P	33PK3	33PS	33PBL	33 3/8 861	33UP	2 0.9
54 9/16	1385	64P	64PK3	64PS	64PBL	64 1370	64UP	3 1.4
62 7/16	1590	63P	63PK3	63PS	63PBL	62 1675	63UP	3 1/2 1.6
						70 1778	70UPK3	3 3/4 1.7
74 5/8	1895	74P	74PK3	74PS	74PBL	74 1880	74UP	4 1.8
86 5/8	2200	86P	86PK3	86PS	86PBL	86 2185	86UP	4.5 2.0
96 5/8	2454	**96P						1/2 2.5

Replacement Parts

Each kit includes components for one original Super Adjustable or Super Adjustable 2 shelf, (4) wedges, (4) sleeves, (4) shelf releases.

Cat. No. SAKITA2

Important: When ordering by components remember that for maximum stability, units should be kept as wide and low as possible.

All Metro Catalog Sheets are available on our Web Site: www.metro.com



InterMetro Industries Corporation
 North Washington Street, Wilkes-Barre, PA 18705
 Phone: 570-825-2741 • Fax: 570-825-2852
 For Product Information Call: 1-800-433-2232

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A local extractor with friction joints for worksites where great flexibility is required.

The TERFU is a local extractor with friction joints designed for use in workplaces where great flexibility is required e.g. laboratories, production environments, and lighter industrial applications.

Simple, easy function. The friction joints have a large frictional diameter and are supported with ball bearings. The degree of friction is easily adjusted with a one-hand knob. Adapted support springs balance out the weight of the arm. All arms are equipped with a 360 degree rotational swivel mounted in place. An air tight damper is fitted as standard.

Always easy to select the right product. Terfu is available in two versions:
 – Standard version. Suitable for evacuation of most types of airborne contaminants.
 – PP version. Most suitable for evacuation of highly corrosive contaminants in high concentrations.

All sizes are suitable for table mounting, ceiling mounting and wall mounting. The same suction arm is used for suspended mounting from ceilings and walls. Ceiling and wall brackets both consist of an anodized square aluminum profile for durable surfaces and high stability.

All ceiling brackets are available in eight standard lengths up to 80 inches. Longer lengths can be supplied by special orders. To further simplify your mounting and provide a cleaner look, an MTI CT escutcheon plate can be used to cover rough cut holes in the false ceiling.

The TERFU system is design protected with several patents- and design protections pending.

The Movex range also includes fans, accessories, automatic controls and filters suitable for local extraction.

LOCAL EXTRACTION
Pure advantages

SNORKEL EXHAUST UNIT CUT SHEET

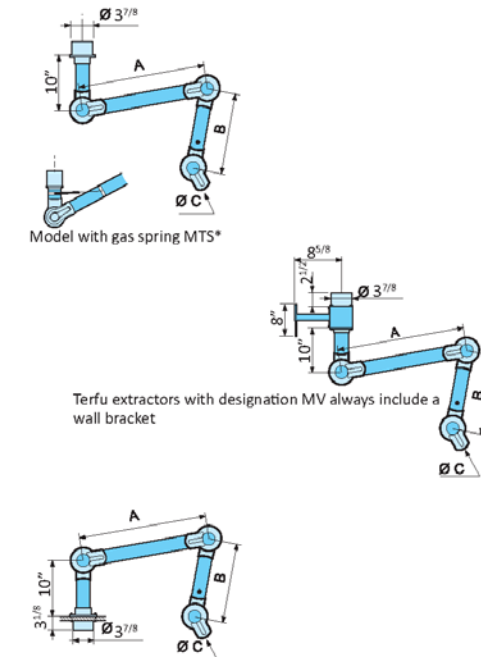
Model MT 1500-75- 3" diam

75 c.f.m. per Div 23

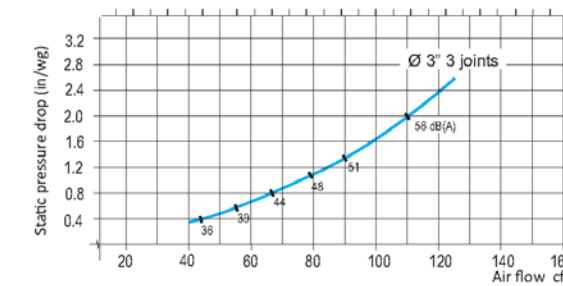
Ceiling mount		Size (inch)			Weight	
Designation		A	B	Total length	C	lb
MT 1000-75	PP	16	12	40	3	5.0
MT 1300-75	PP	22	18	51	3	5.7
MT 1500-75	PP	30	18	60	3	6.0
MT 2000-75	-	40	26	80	3	7.1
MTS 1500-75	PP	30	18	60	3	6.0
MTS 2000-75	PP	40	26	80	3	7.1

Wall mount		Size (inch)			Weight	
Designation		A	B	Total length	C	lb
MV 1000-75	PP	16	12	40	3	9.7
MV 1300-75	PP	22	18	51	3	10.4
MV 1500-75	PP	30	18	60	3	10.7
MV 2000-75	-	40	26	80	3	11.8
MVS 1500-75	PP	30	18	60	3	10.7
MVS 2000-75	PP	40	26	80	3	11.8

Table mount		Size (inch)			Weight	
Designation		A	B	Total length	C	lb
MB 1000-75	PP	16	12	40	3	5.0
MB 1300-75	PP	22	18	51	3	5.7
MB 1500-75	PP	30	18	60	3	6.0



Pressure drop diagram



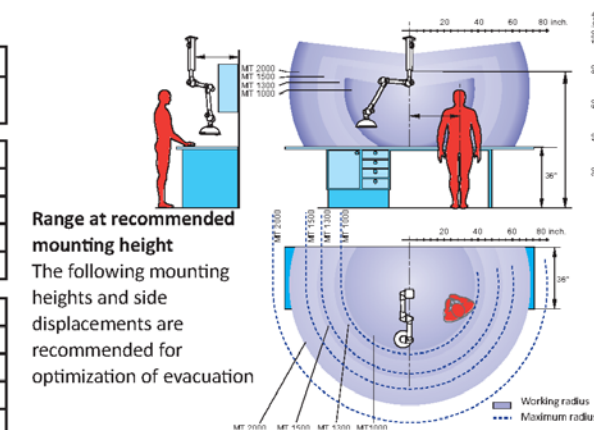
The static pressure drop is measured in accordance with ISO-standard 5167-1. The noise level is measured in accordance with ISO-standard 3741.

Project planning advice

Function	Air flow
Laboratory	70-85 cfm
Schools	70-85 cfm

Designation	H inch
MT 1000	64-76
MT 1300	72-84
MT 1500	76-88
MT 2000	84-96

Designation	S inch
MT 1000	12-24
MT 1300	16-24
MT 1500	20-32
MT 2000	28-40



Range at recommended mounting height
 The following mounting heights and side displacements are recommended for optimization of evacuation

Flammable Liquid Safety Storage Cabinet, 24 Gal. Yellow, One Door, Self Close



[View Gallery](#)

Model Number:

2310

UPC Code:

048441333950

Description:

Eagle's 24 Gallon, Self-Closing, Space Saver Safety Cabinet is constructed of 18-gauge steel. The sides, top, bottom, and doors are double-walled with a 1 1/2" air space between walls. Includes two vents, each have 2" threaded fittings and fire baffle and cap. Standard Flammable Liquid Safety Cabinets come in yellow high gloss powder finish with red warning, plus grounding attachment, 3-point latch system, and 2" raised, leakproof door sill. Each shelf is adjustable, supported by 4 brackets, and can support 350 pounds. (All Eagle metal cabinets meet NFPA Code 30 and OSHA requirements).

Capacity:

24 gal.

Color:

Yellow

Door Style:

Self Close

Inside Dimensions:

20" W x 15" D x 62" H

Lock:

True

Number of Shelves:

3

FLAMMABLE CABINET CUT SHEET

Flammable cabinets should not be vented.

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.

