



Research Lab Concepts

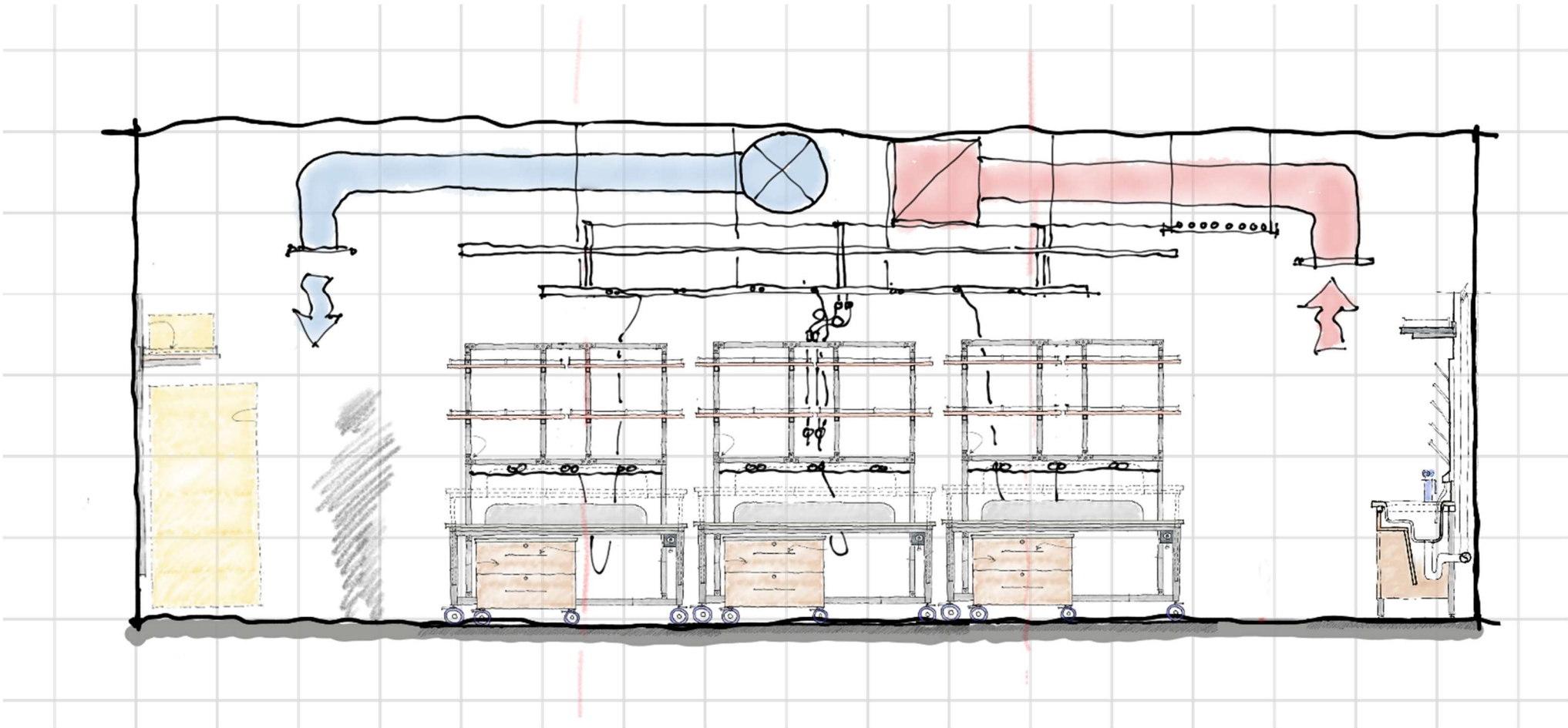
WSU E-A-B Renovation

Abelson Levels 4, 3, 2

2023 Oct 31

Andersen/Gensler

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5 ELEMENTS OF PROTEAN LAB DESIGN

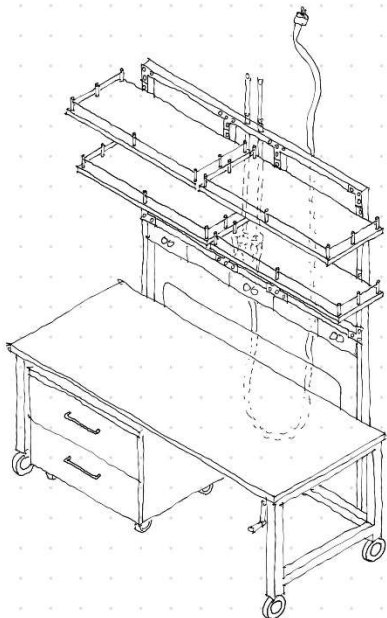
The adjective, PROTEAN, is derived from the name of the Greek god of the sea, Proteus, who is capable of changing his form at will. PROTEAN connotes adaptable, flexible, and versatile. Characters in literature with Protean abilities are typically portrayed as flexible and ingenious, and extremely powerful, whether a villain or a hero.

PROTEAN lab elements are defined as five key components, from which all other elements of physical lab design are derived. These basic 5 elements of physical lab design are:

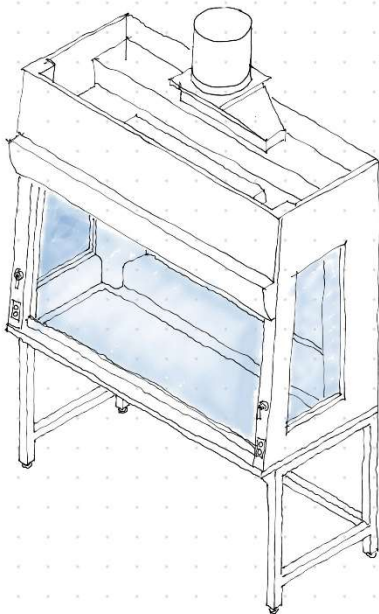


- Analyze:** The PROTEAN lab work bench station.
 - 30"Wx72"Lx84"H. CFCI and/or OFOI.
 - (3) duplex 115v power outlets integral with heavy duty power cord, twist lock
 - Air & Vac integral with quick connects
 - Heavy duty lockable casters
 - Work surface adj height 30-40" with manual crank
- Contain:** The PROTEAN lab chemical fume hood work station. CFCI.
 - 36"Dx60"Lx96"H
 - Variable Air Volume
 - 600 c.f.m. exhaust; 80 f.p.m face velocity
 - Glass side panels; Rear glass panel if located at window
- Equip:** The PROTEAN lab equipment station for OFOI floor mounted equipment.
 - Refrigerators
 - Freezers
 - Biological Safety Cabinets (Class II Type A2)
 - Centrifuges
 - Carts
 - 115v stand-by power; 208v stand-by power at select locations
 - Air/Vac at select locations
- Store:** The PROTEAN lab storage station. CFCI and/or OFOI
 - 24"Dx48"Lx60"H
 - 5 tier wire shelving
 - Heavy duty lockable casters
- Wash:** The PROTEAN lab sink station. CFCI.
 - 30"Dx72"Lx84" H
 - Accessible at select locations
 - Accommodates pure water polisher
 - 115v fourplex at wall above work surface
 - 115v fourplex below for water polisher
 - HW/CW with vacuum breaker
 - Eyewash with domestic water
 - Domestic water stub out & valve below for water polisher

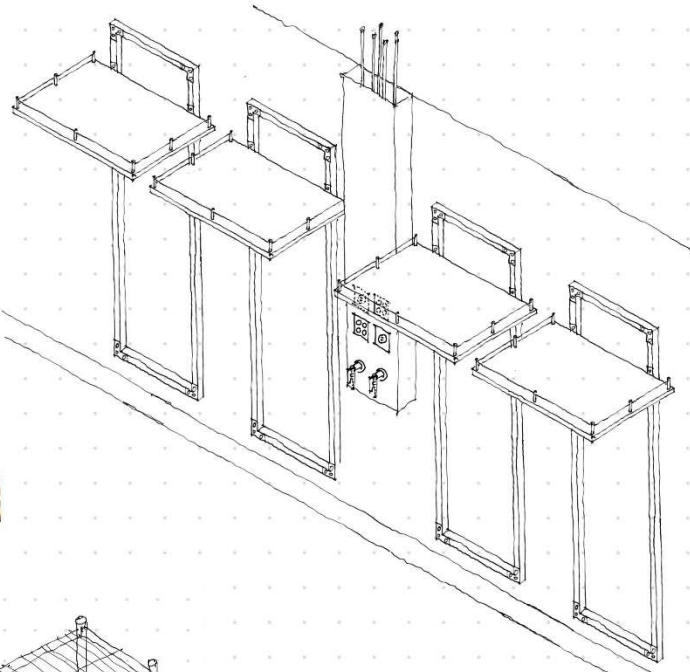
Analyze



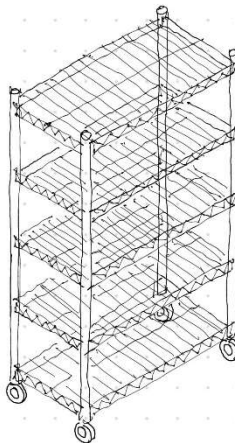
Contain



Equip

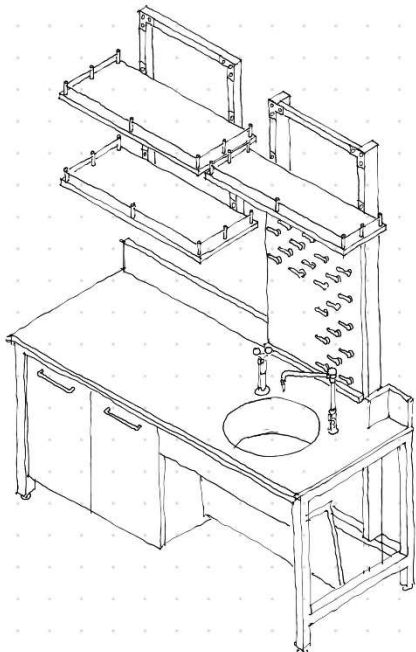


Store

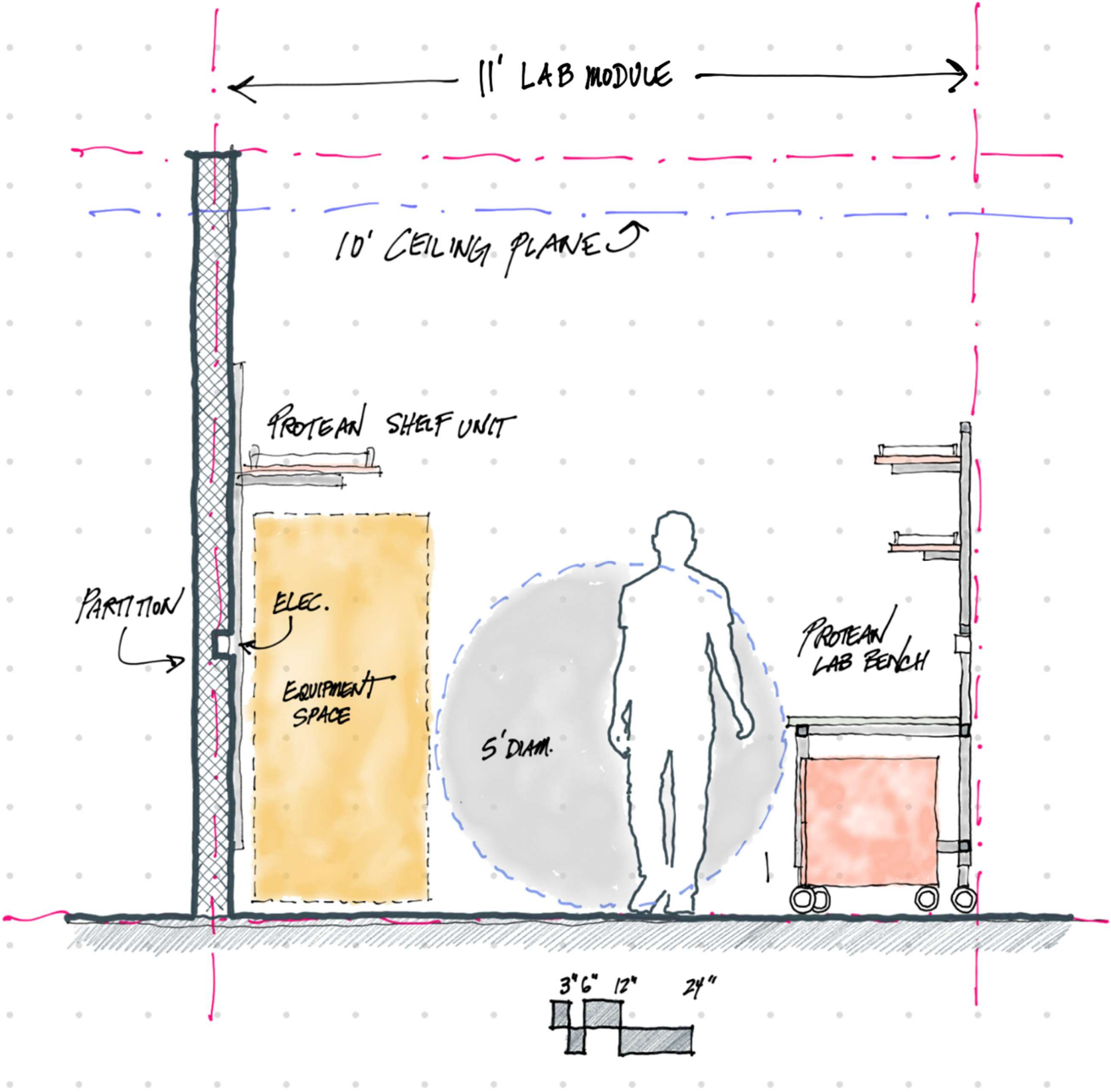


Note: Tall storage cabinets with doors can be provided in lieu of Metro shelf units at added cost

Wash



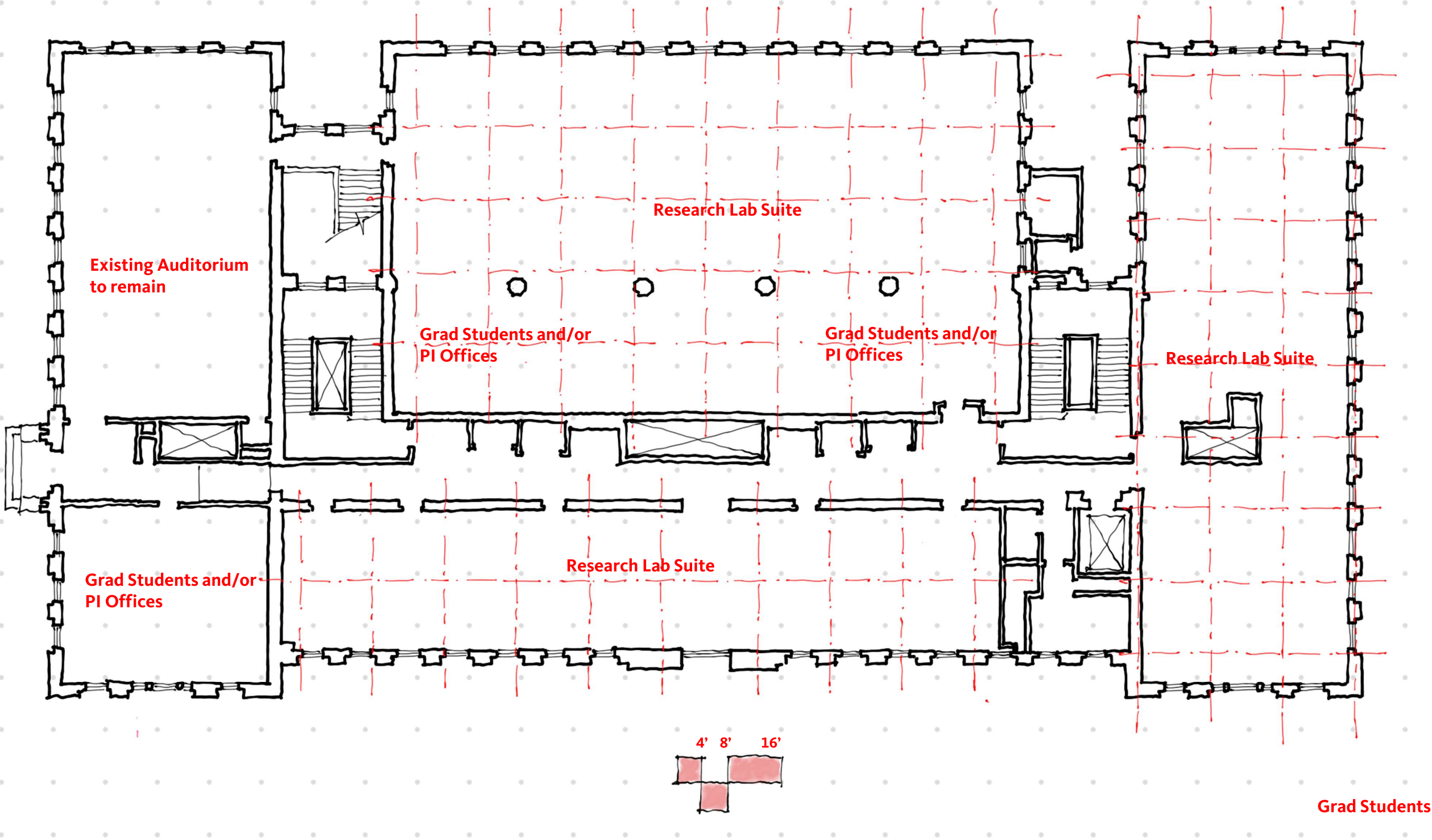
11' LAB MODULE



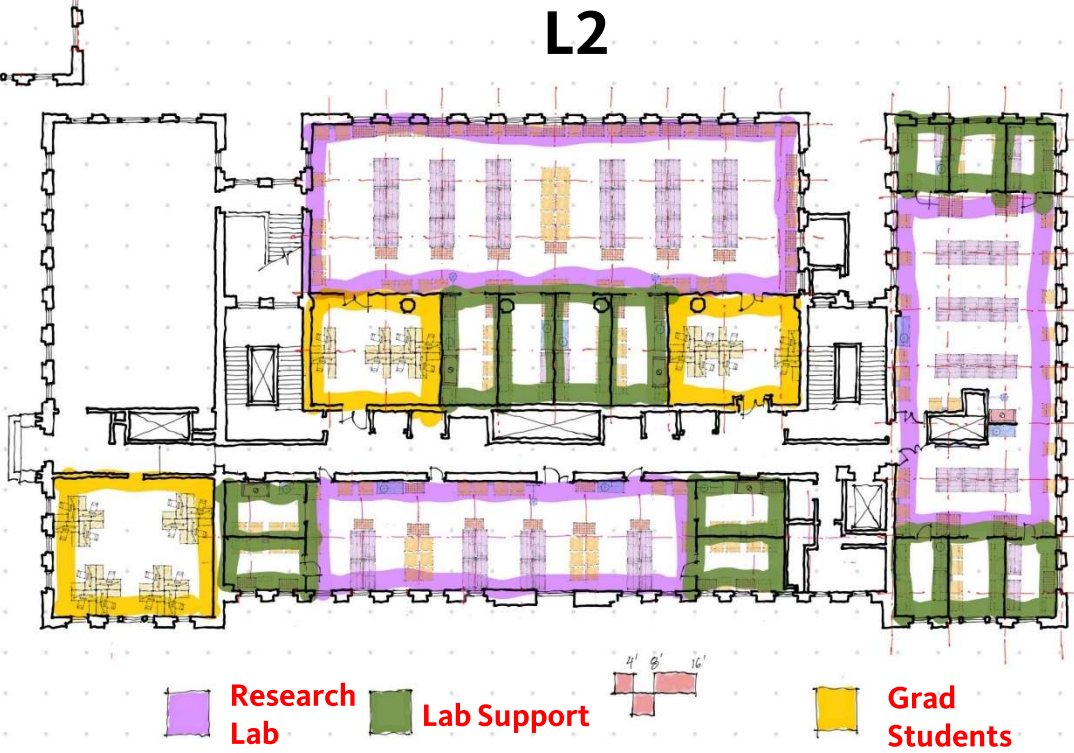
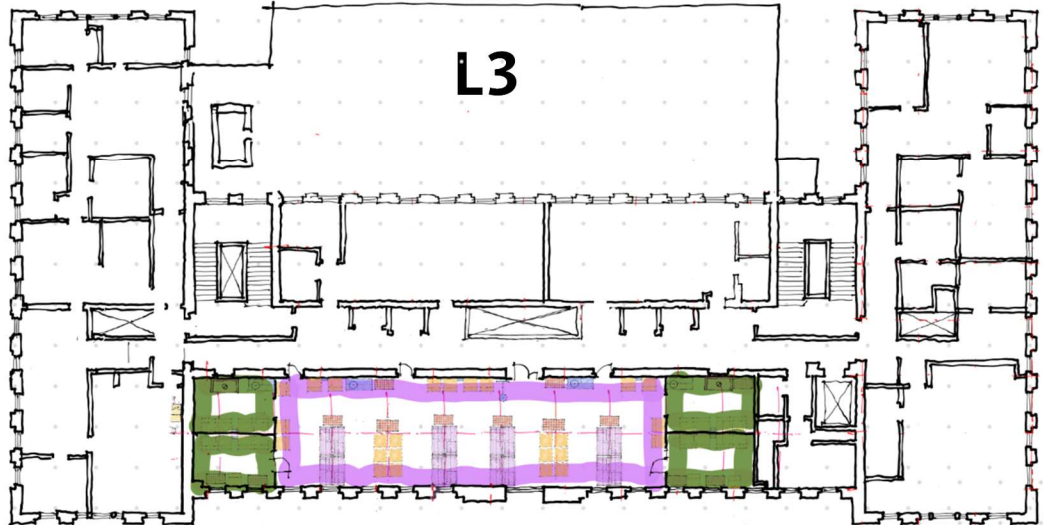
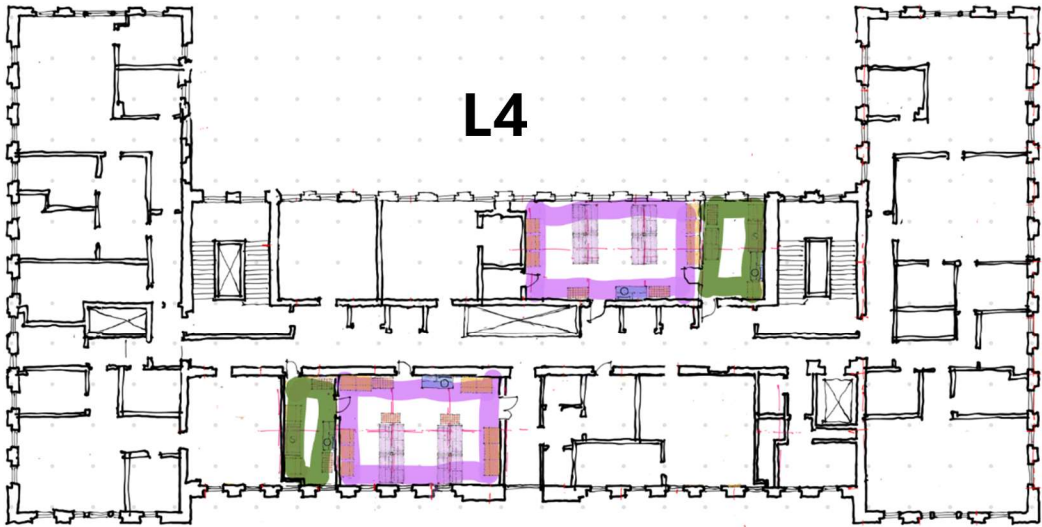
The use of a lab module helps achieve greater efficiency and thereby provides the best ratio of lab bench/lab equipment to aisle space.

The 11' lab module width allows for ADA accessibility requirements, and provides adequate equipment depth for the significant amount of lab equipment used in modern research labs.

The 11' lab module is used as a planning methodology for developing the lab and lab support rooms.



RESEARCH LABORATORY
Function Plan- Abelson L4, L3, L2



RESEARCH LABORATORY

P.I. Assignment Plan- 12 P.I.s

Level 4:

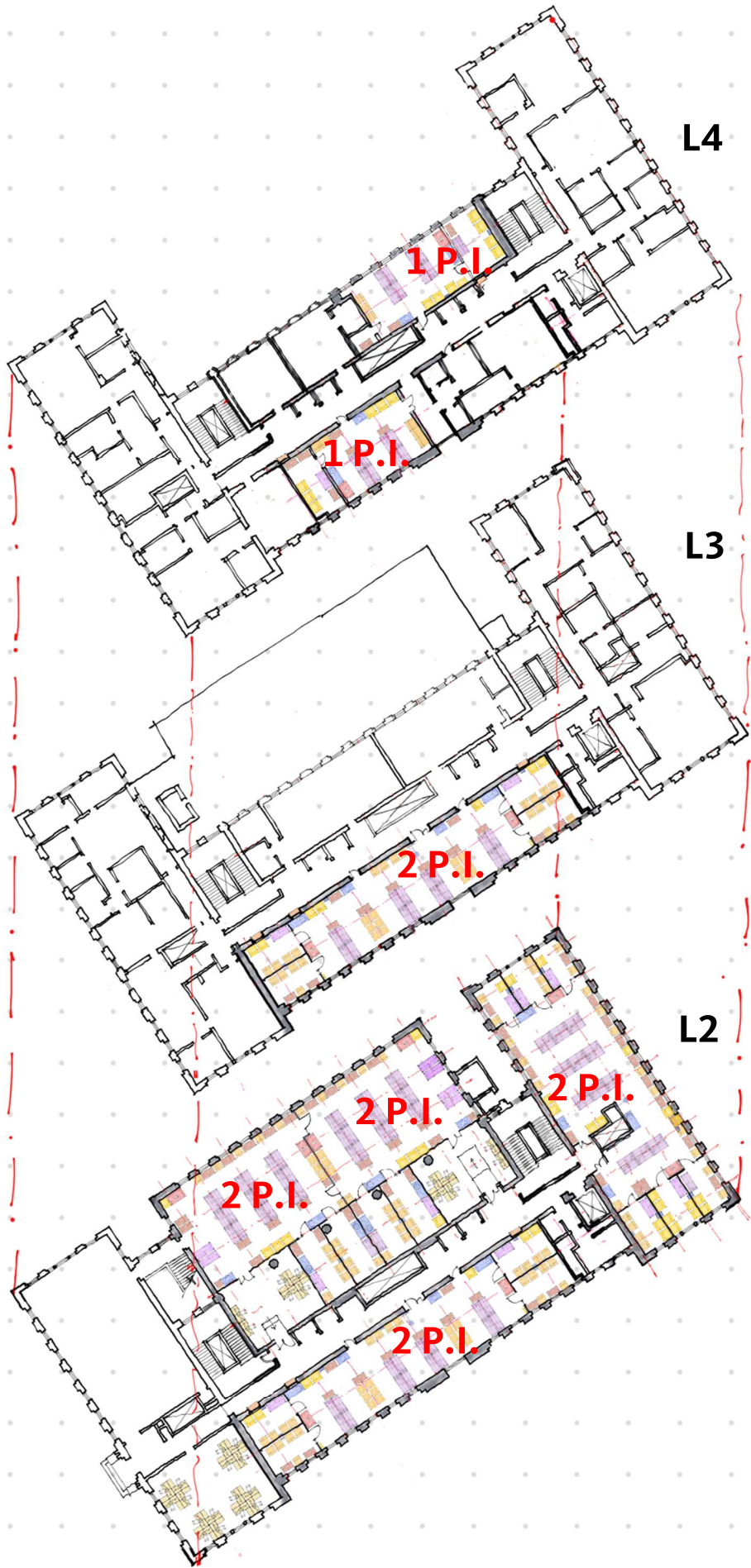
- One PI lab north side
1 chem hood; 2 sinks
- One PI lab south side
1 chem hood; 2 sinks

Level 3:

- Two PI lab suite south side
2 chem hoods; 4 sinks

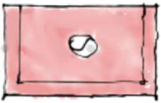
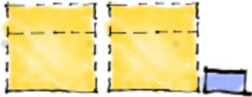
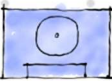
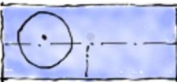
Level 2:

- Two PI lab suite, north side, west
- 2 chem hoods; 3 sinks
- Two PI lab suite, north side, east
- 2 chem hoods; 3 sinks
- Two PI lab suite, east side
- 2 chem hoods; 4 sinks
- Two PI lab suite, south side
- 2 chem hoods; 4 sinks



RESEARCH LABORATORY

Symbol Legend

	• PROTEAN Lab Bench-30"W x 72" L x 84" H 2 rows shelves above; Mobile base cabinet below 6 115v plugs; Air, Vac with quick connects Heavy duty lockable casters
	• PROTEAN Chemical Fume Hood- 36"W x 60" L x 96" H 600 c.f.m. exhaust to roof; VAV 4 115v plugs; Air, Vac; No water, no cup sink Corrosive cabinet below, vented to superstructure Glass side walls
	• PROTEAN Equipment Space, single 36"W x 36" L x 96" H Unistrut frame at wall with shelf 115v duplex or fourplex standby with exposed conduit at face of wall 208v standby at select locations
	• PROTEAN Equipment space, double 36"W x 84" L x 96" H Unistrut frame at wall with shelf above each equipment Wall service module with power, vac, air, as required 115v standby and/or 208v standby as required
	• Cylinder Restraint 2 rows unistrut with welded link st stl chain, carabiner attachment At select locations in labs, not shown in all labs
	• Metro Storage Unit, mobile; Note: Tall storage cabinets can be added in lieu of metro shelf units at added cost 24" W x 48" L x 60" H 5 rows adjustable shelves Heavy duty locking casters
	• Hand Wash Sink station at lab entry points 30" W x 48" L x 96" H HW/CW domestic Paper towel dispenser, soap dispenser Shut-off valves above sinks
	• PROTEAN Lab Sink Station 30" W x 72" L x 96" H HW/CW with vacuum breaker RO Water feed for point-of-use water polisher 115v fourplex at work surface and below Shut-off valves above sink
	• Safety Shower/Eyewas/Fire Extinguisher Floor drain below at floor if possible/feasible

RESEARCH LABORATORY

Program Requirements

Similar for L4, L3, L2 research labs

GENERAL

- Location: Abelson L4, L3, L2
- Function: Life science research lab
- Quantity: 7 similar labs
- Capacity: 1-2 PIs per lab suite; 8-12 research personnel per lab suite
- Hours of operation: 24/7/365
- Biosafety Level: 1

ARCHITECTURAL

- Floor: Sealed concrete or rubber tile; rubber base
- Walls: Metal stud, gypsum board, enamel paint
- Ceiling: 10' acoustic cloud, open at perimeter preferred; or wall to wall
- Doors: 3'-6"x8'-0" upper glass with metal frame; 3'-0"/1'-6" or 3'-0"/3'-0" pair x 8'-0" at lab entry
- Security: Card reader

STRUCTURAL

- Vibration Attenuation: 6,000 microinches per second or less
- Live Load: 125 lbs/sf
- Existing structure to prevail

MECHANICAL

- Temperature: 68-74 deg F +/- 2 deg F
- Humidity: Ambient
- Pressure: Negative to corridor; Procedure rooms negative or positive depending upon use
- Exhaust: 100%- no recirculation
- Heat gain: 25 btuh/sf in main lab area; 50 btuh/sf in procedure rooms

PLUMBING

- Domestic water: Hot/Cold at lab sinks with vacuum breaker
- Pure Water: Point-of-use water polisher at select lab sinks with RO feed
- Tepid Water: at safety shower/eyewash
- Floor Drain: at safety shower if possible
- Centrally piped gases: Air, vacuum at select lab benches
- Consider local cylinders in lieu of central air; consider vac pumps in lieu of central vac
- Local cylinder gases: Insert gases as needed

ELECTRICAL

- Normal power: 115v20a dedicated circuits at octagon lab benches; duplex at perimeter at ~3' on center
- Standby power: at equipment space at 6' on center
- Lighting: LED at 500 LUX; task lighting at lab bench provides 750 LUX at bench
- Data: Hardwire and wireless

CONTRACTOR FURNISHED EQUIPMENT

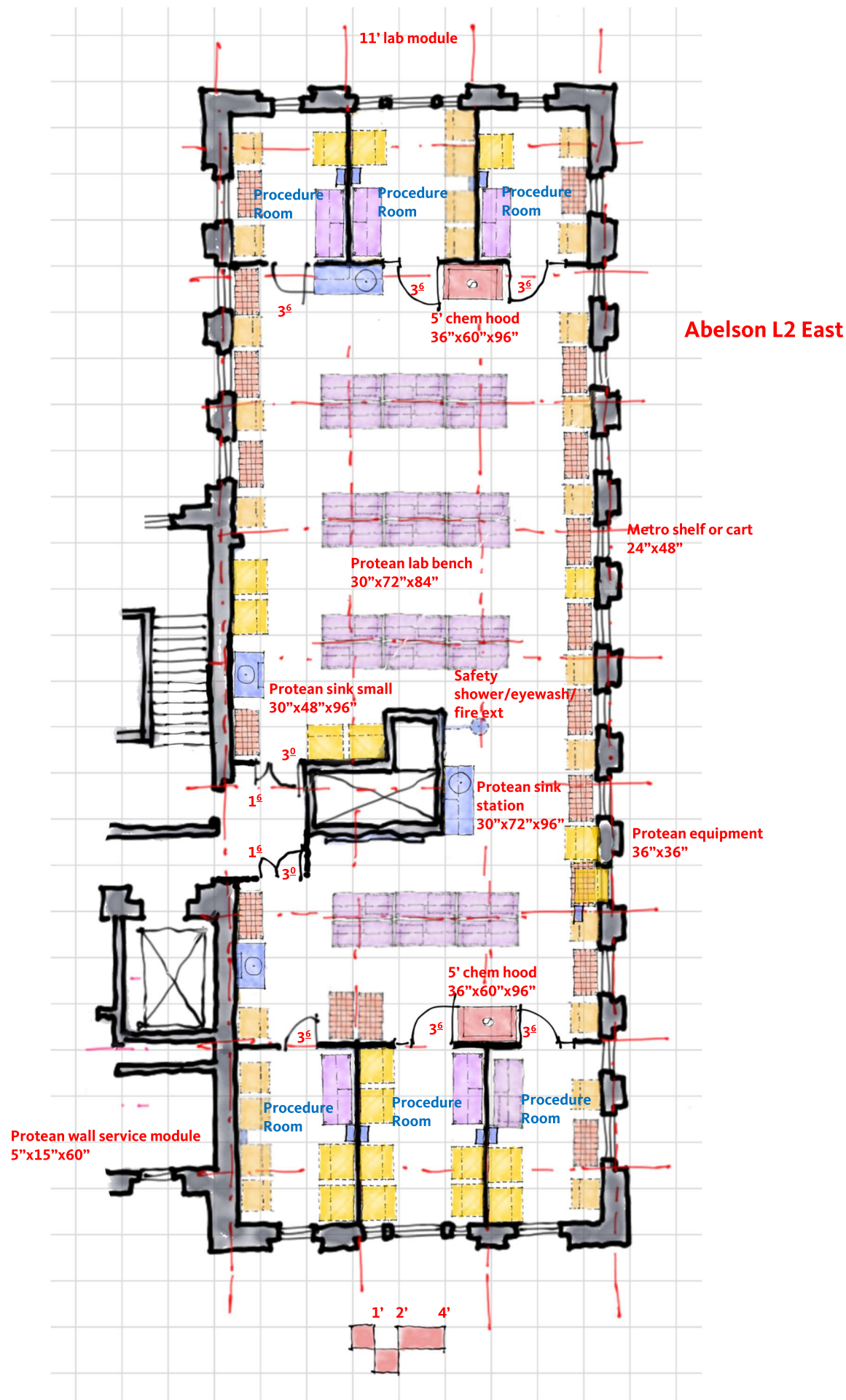
- Protean lab benches; Protean sink stations; Protean equipment stations
- Chemical fume hoods
- Cylinder restraints at select Protean equipment locations
- Safety shower/eyewash/fire ext

UNIVERSITY FURNISHED EQUIPMENT

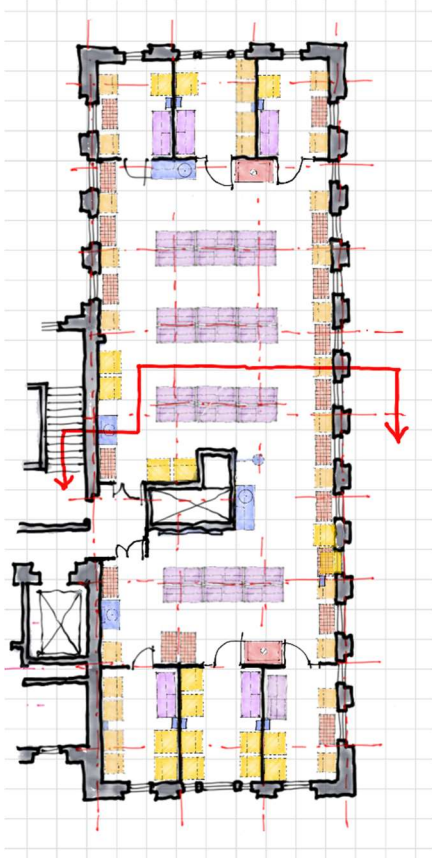
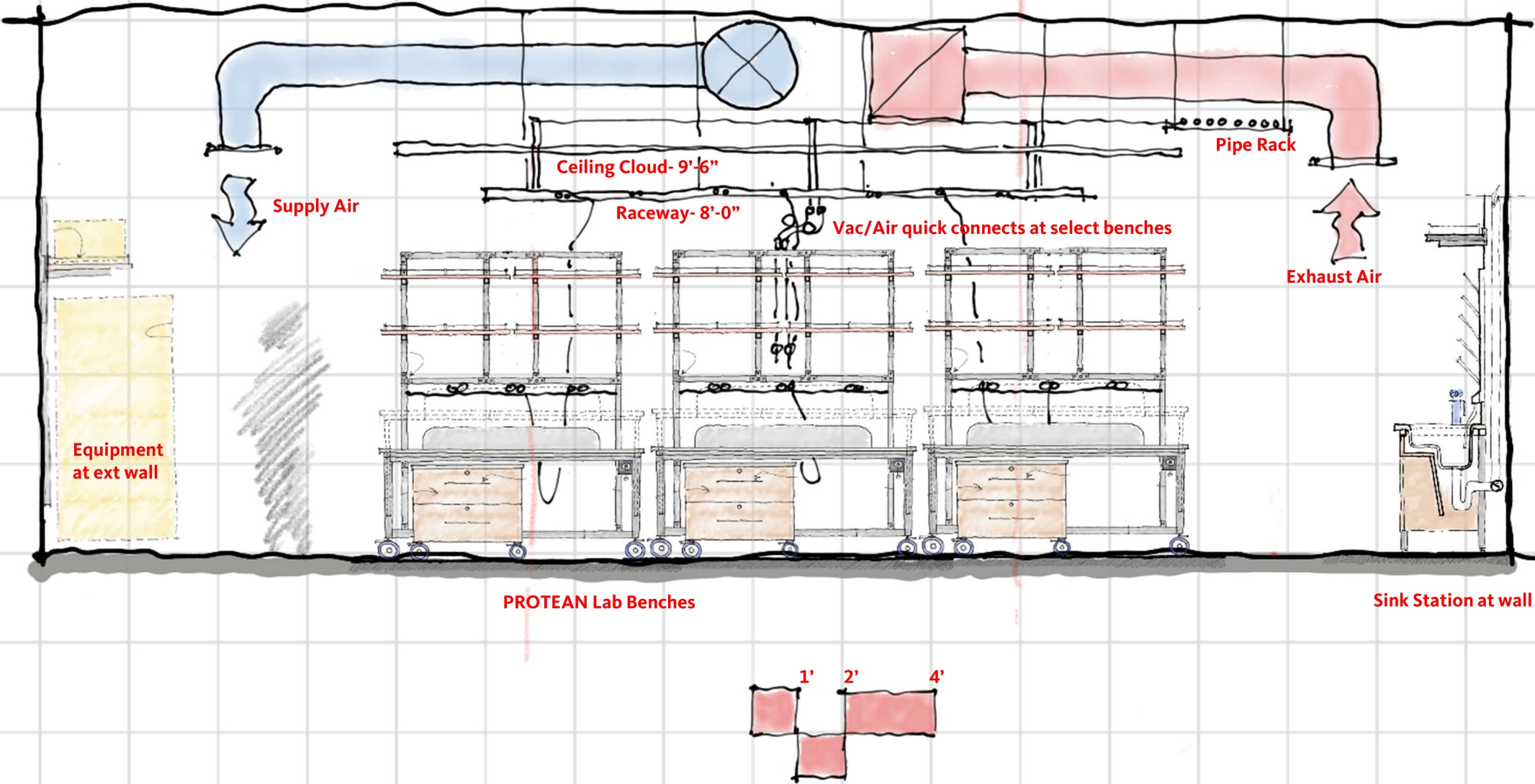
- Refrigerators
- Freezers
- Centrifuges
- Microscopes
- Benchtop instruments
- Metro shelf units

Planning Strategies:

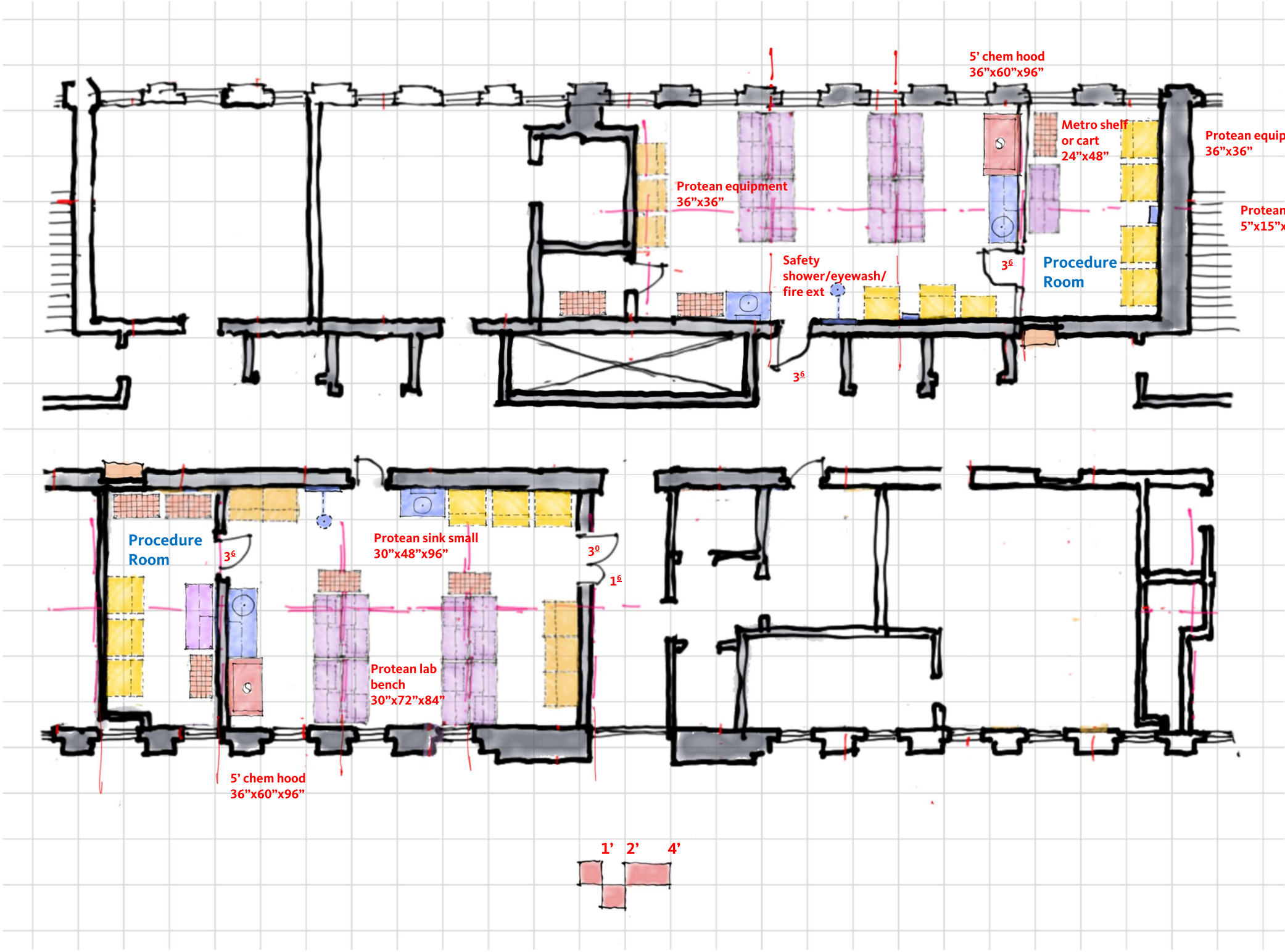
- Applies to all research labs, L4, L3, L2
- No fixed casework at perimeter window wall. Equipment space and Metro storage units only at exterior wall.
- Lab benches are flexible/mobile/adjustable. Lab bench density can be reduced and replaced with open floor equipment space as a cost saving strategy.
- Lab area above electron microscope suite on L1 is limited to lab benches and equipment, no sinks, no fume hoods.



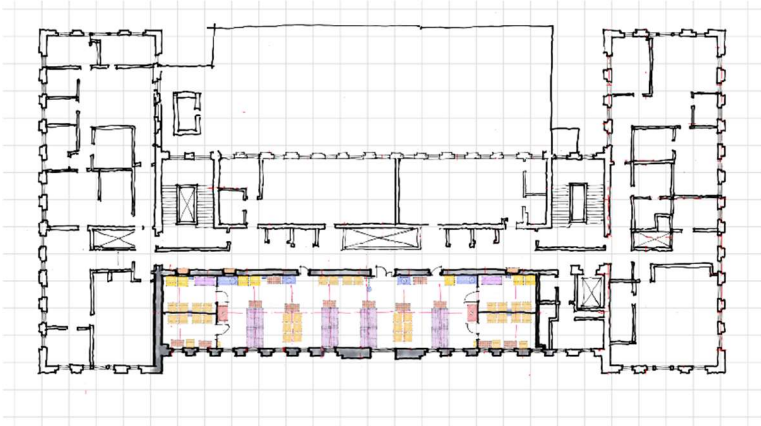
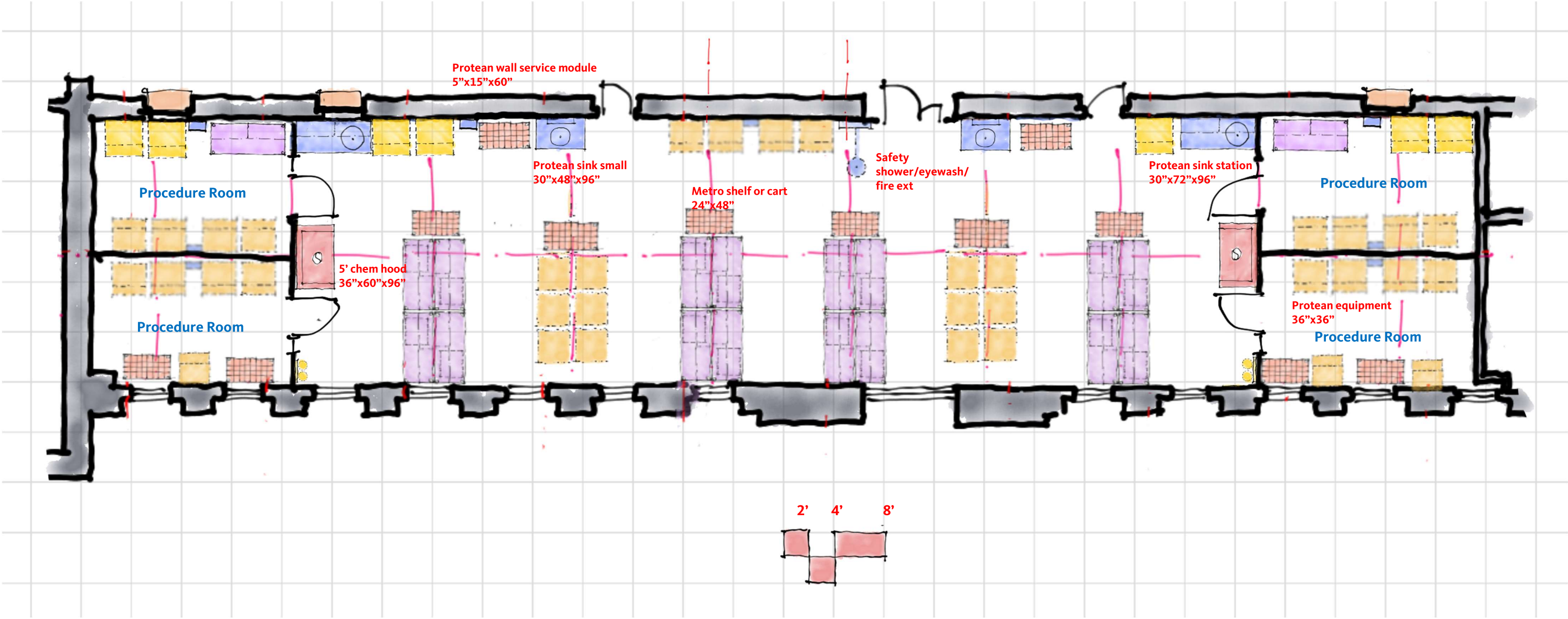
RESEARCH LABORATORY
Concept Section/Elevation



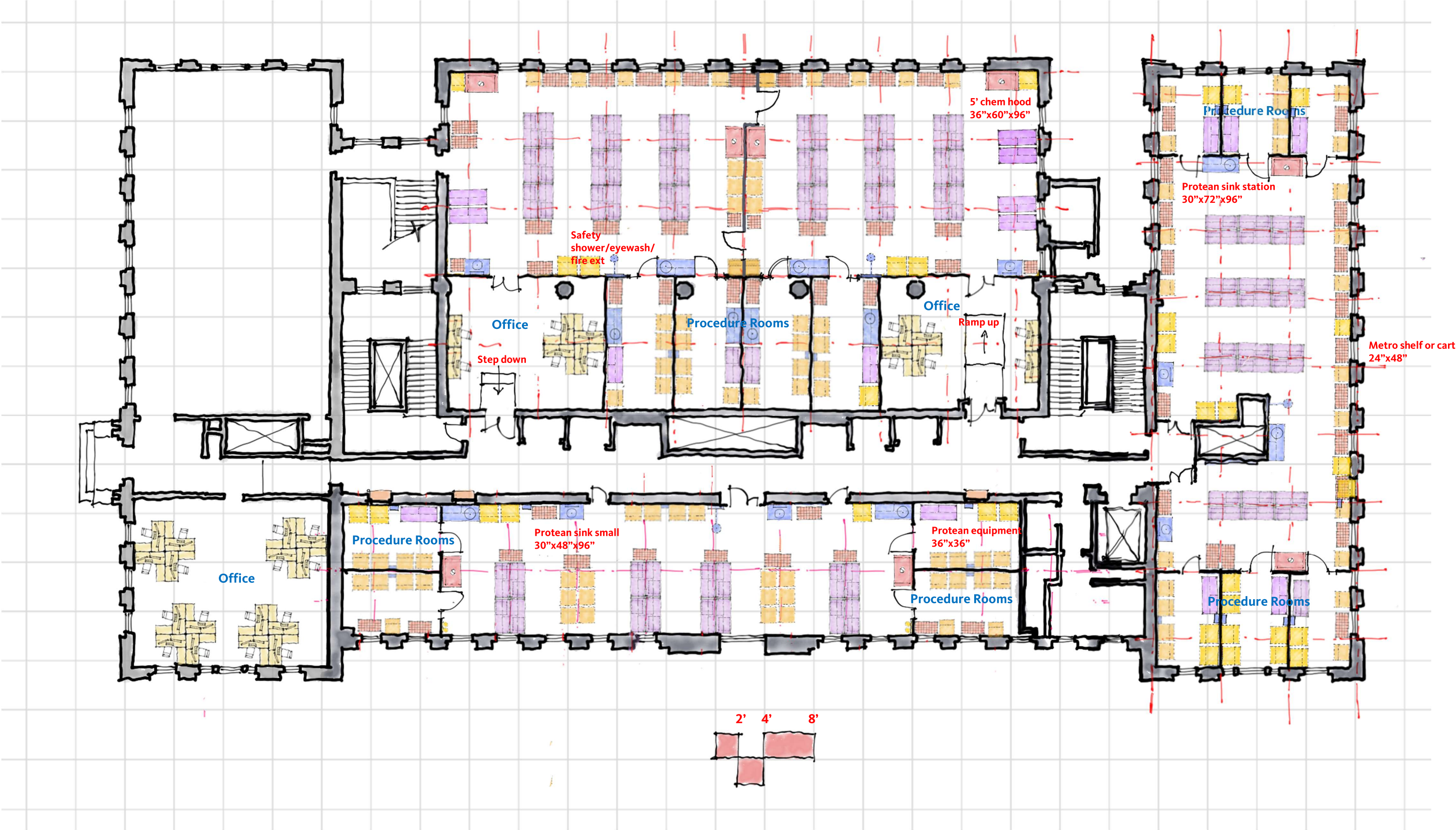
RESEARCH LABORATORY
Abelson L4



RESEARCH LABORATORY
Abelson L3



RESEARCH LABORATORY
Abelson L2



RESEARCH LABORATORY

● **Contain- Chemical Fume Hood Plan**

Level 4:

2 chem hoods, one per PI

Level 3:

- 2 chem hoods, one per PI

Level 2:

- 8 chem hoods, one per PI



RESEARCH LABORATORY

● Wash- Lab Sink Station Plan

Level 4:

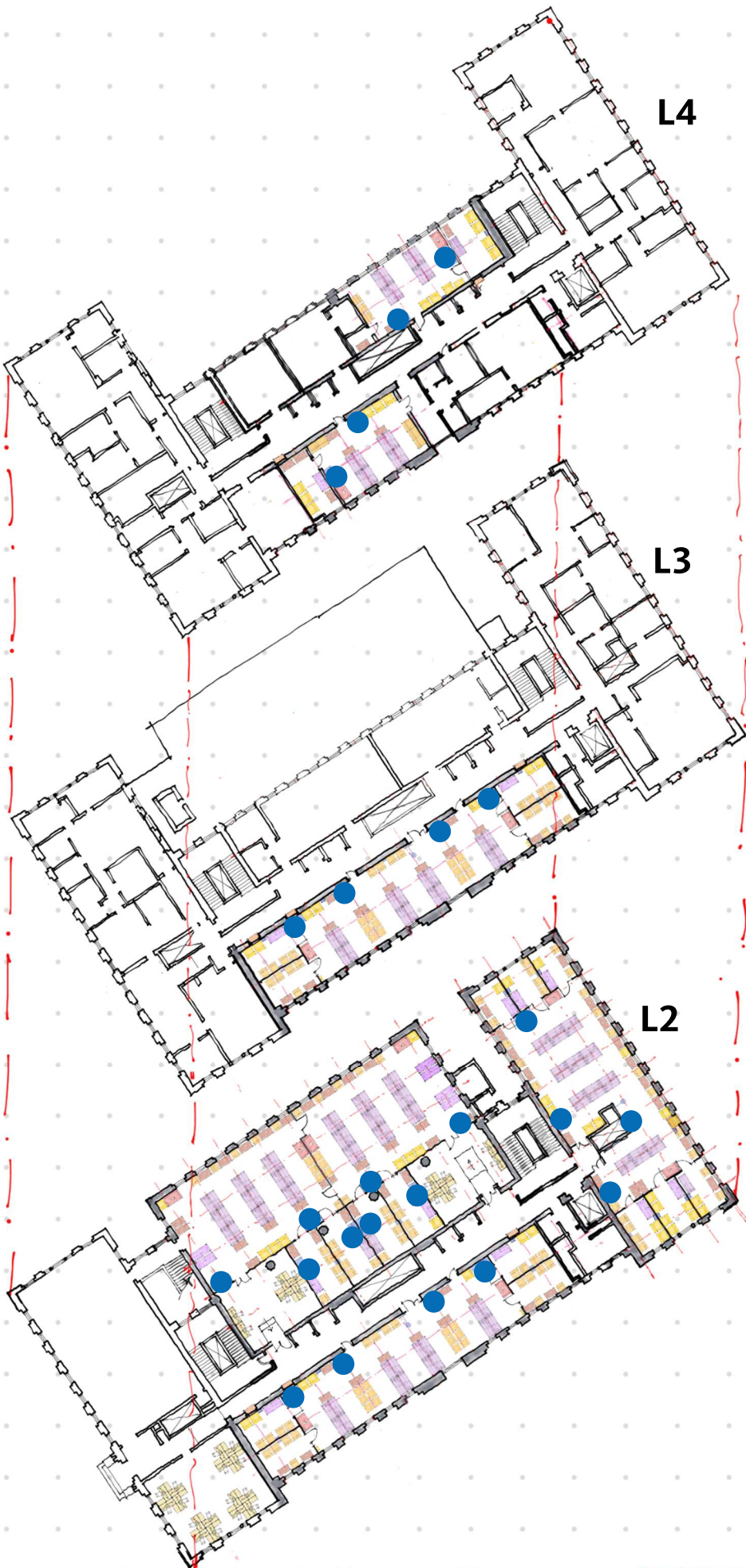
4 sinks, two per PI

Level 3:

- 4 chem hoods, two per PI

Level 2:

- 16 sinks, two per PI



RESEARCH LABORATORY

● **Safety Shower/Fire Ext Plan**
4 safety showers- max 55'/10 second travel distance
Combination Safety Shower/Eyewash/Fire Ext unit

Level 4:

2 showers, one per lab

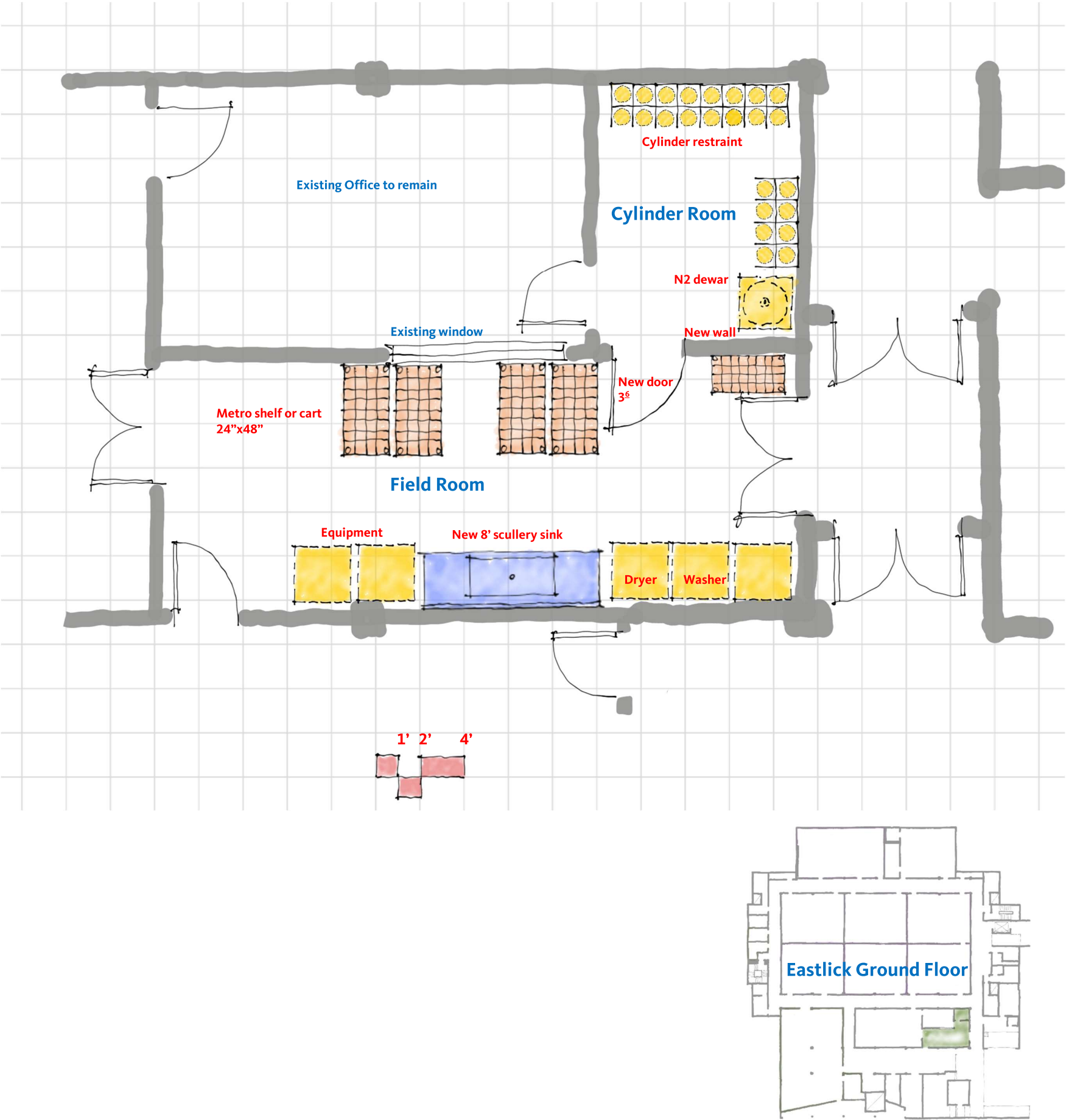
Level 3:

- 1 shower, one per lab suite

Level 2:

- 4 showers, one per lab suite





FIELD ROOM

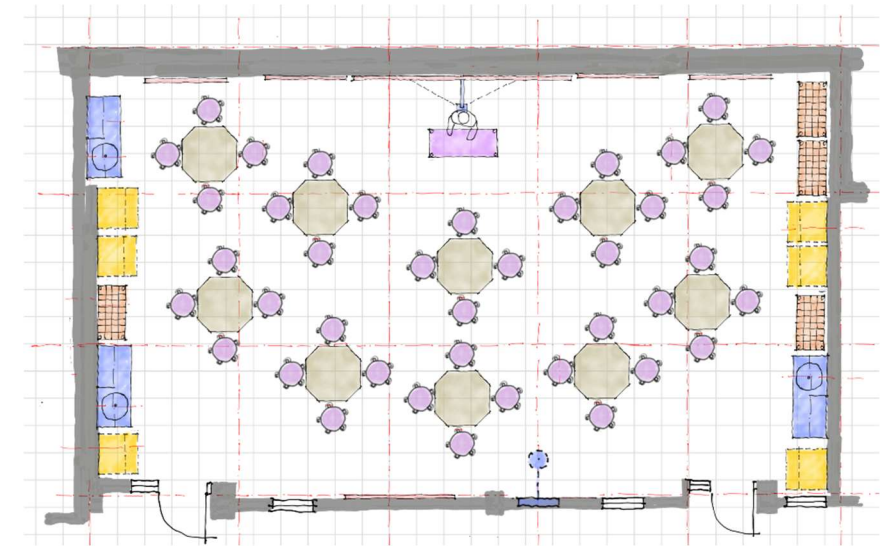
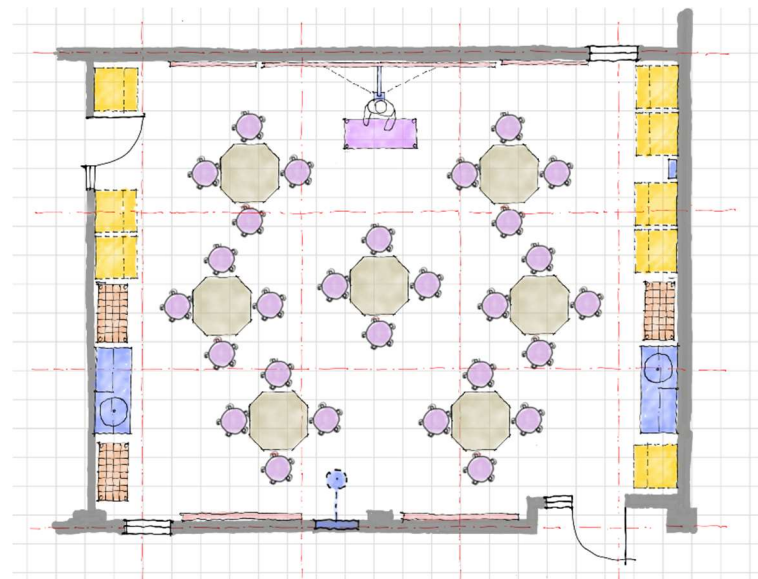
Program Requirements

- GENERAL**
- Location: Eastlick Ground Floor
 - Function: Storage of field supplies for research labs
 - Quantity: 1
 - Capacity: 2-3 research personnel
 - Hours of operation: 24/7/365
 - Biosafety Level: None
- ARCHITECTURAL**
- Floor: Existing floor to remain.
 - Walls: Existing walls to remain, except where noted.
 - Ceiling: Existing to remain.
 - Doors: 1 new door: 3'-6"x8'-0" upper glass with metal frame
All other doors shown are existing
 - Security: Card reader
- STRUCTURAL**
- Vibration Attenuation: 6,000 microinches per second or less
 - Live Load: 125 lbs/sf
 - Existing structure to prevail
- MECHANICAL**
- Temperature: 68-74 deg F +/- 2 deg F
 - Humidity: Ambient
 - Pressure: Neutral
 - Exhaust: 100%- no recirculation
 - Heat gain: 25 btuh/sf in main lab area
- PLUMBING**
- Domestic water: Hot/Cold water at scullery sink; existing water at washer to remain
 - Pure Water: None
 - Tepid Water: None
 - Floor Drain: None
 - Centrally piped gases: None
 - Local cylinder gases: None
- ELECTRICAL**
- Normal power: 115v20a dedicated circuits duplex at perimeter at ~3' on center
 - Standby power: None
 - Lighting: LED at 500 LUX
 - Data: Existing to remain
- CONTRACTOR FURNISHED EQUIPMENT**
- Scullery sink
 - Cylinder restraint in Cylinder Room
- UNIVERSITY FURNISHED EQUIPMENT**
- Existing washer & dryer to remain
 - Field equipment
 - Metro shelf units
 - N2 dewar
 - Cylinders

Design Criteria Matrix- Research Labs

Wash State Univ E-A-B Renovation as of 2023 Oct 30

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SBS Teaching Lab Concepts

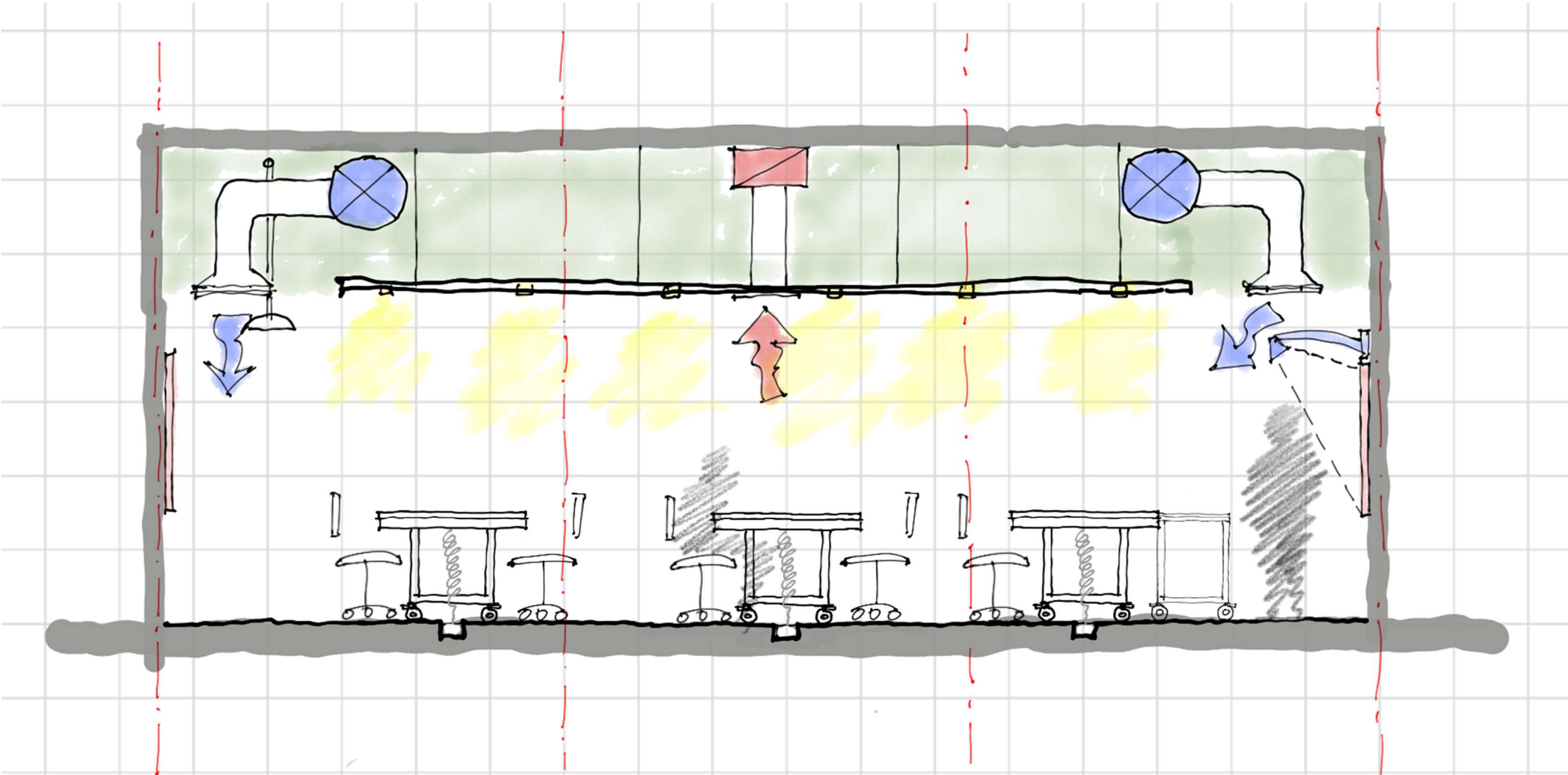
WSU E-A-B Renovation

Eastlick Ground Level

2023 Oct 28

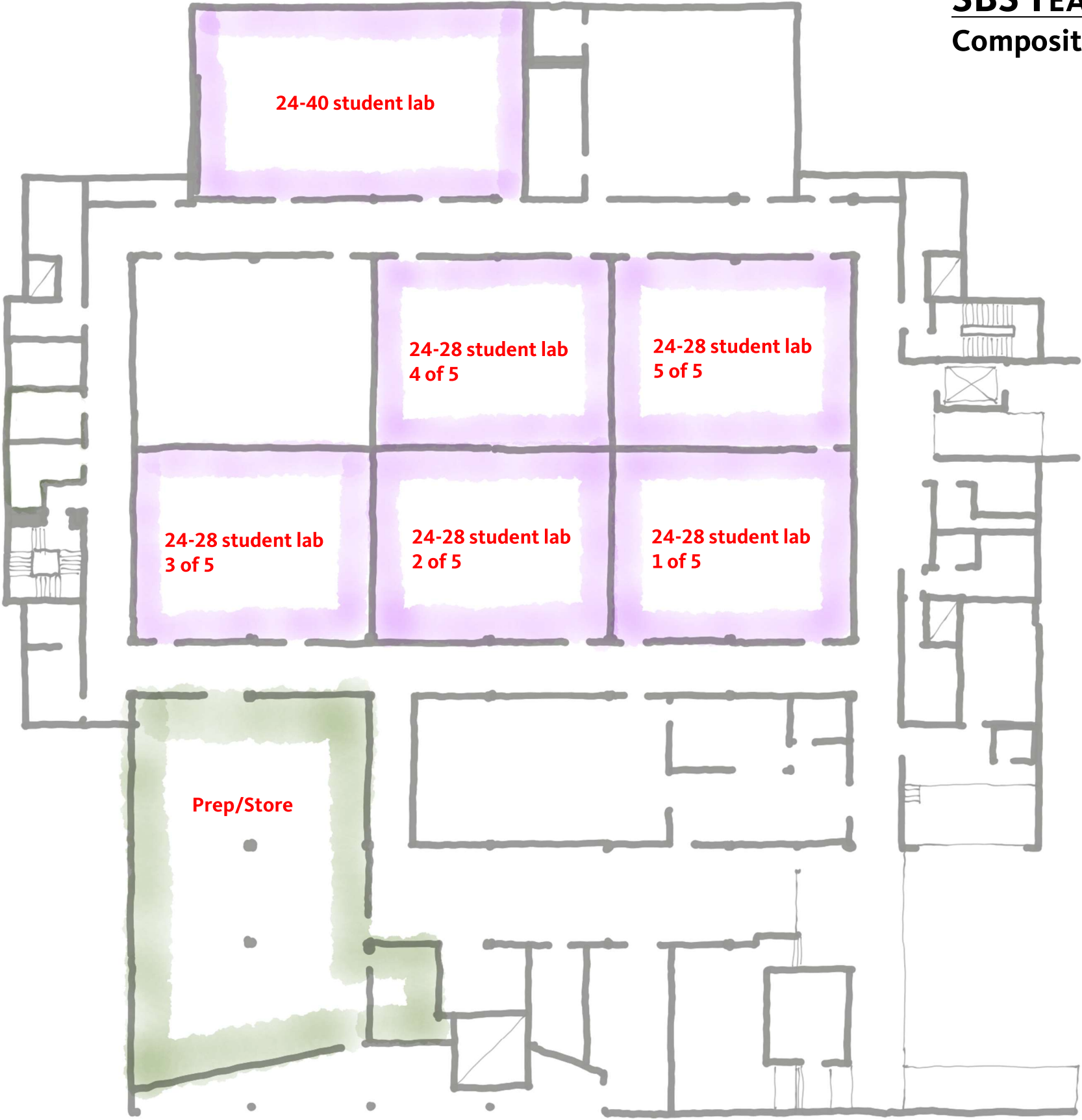
Andersen/Gensler

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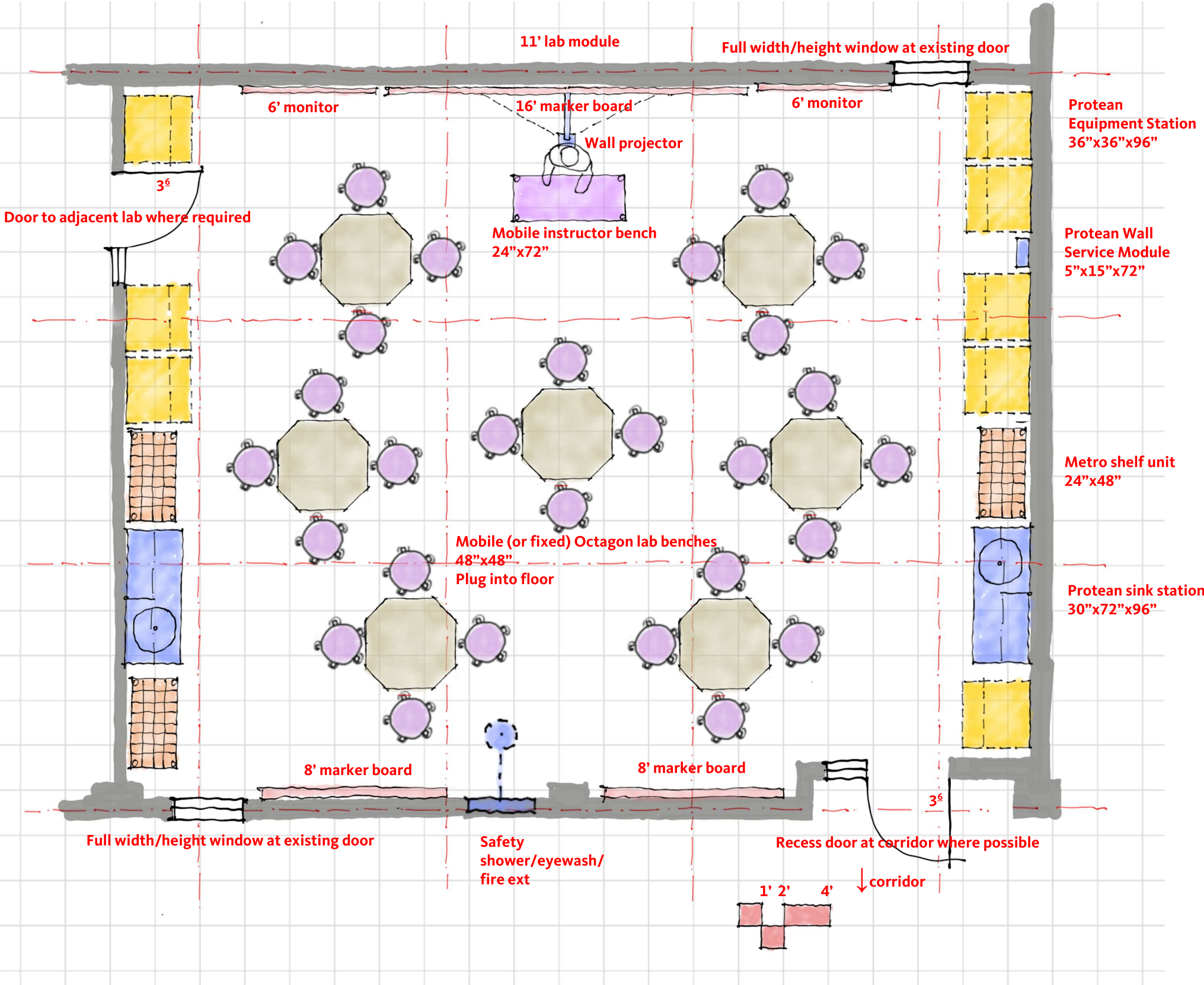
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SBS TEACHING LABORATORIES
Composite Plan- Eastlick Ground



SBS TEACHING LABORATORY

Octagon- 24-28 students



GENERAL

- Location: Eastlick, ground floor center
- Function: Biology teaching lab
- Quantity: 5 similar labs
- Capacity: 1 instructor; 24-28 students
- Hours of operation: 6 am to midnight; 6 days per week
- Biosafety Level: 1

ARCHITECTURAL

- Floor: Sealed concrete or rubber tile; rubber base
- Walls: Metal stud, gypsum board, enamel paint
- Ceiling: 10' acoustic cloud, open at perimeter preferred; or wall to wall
- Doors: 3'-6"x8'-0" upper glass with metal frame
- Security: Card reader

STRUCTURAL

- Vibration Attenuation: 6,000 microinches per second or less
- Live Load: 125 lbs/sf
- Existing structure to prevail

MECHANICAL

- Temperature: 68-74 deg F +/- 2 deg F
- Humidity: Ambient
- Pressure: Negative to corridor
- Exhaust: On demand room exhaust with 30 minute shut-off
- Heat gain: 25 btuh/sf

PLUMBING

- Domestic water: Hot/Cold at lab sinks with vacuum breaker
- Pure Water: None
- Tepid Water: at safety shower/eyewash
- Floor Drain: at safety shower if possible
- Centrally piped gases: None
- Local cylinder gases: Insert gases as needed

ELECTRICAL

- Normal power: 115v20a dedicated circuits at octagon lab benches; duplex at perimeter at ~3' on center
- Standby power: at equipment space at 6' on center
- Lighting: LED at 500 LUX
- Data: Hardwire and wireless

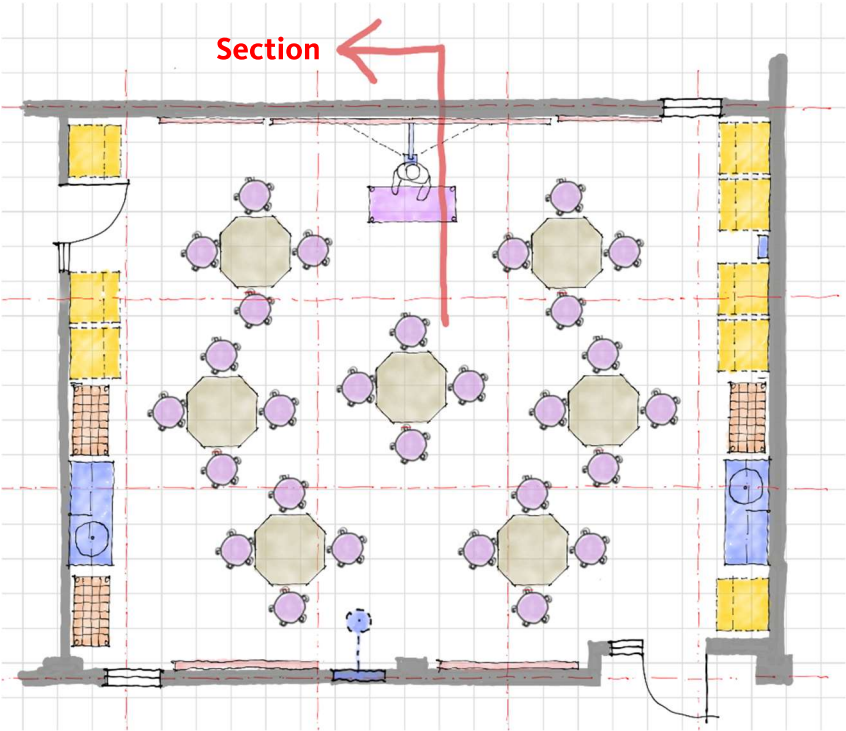
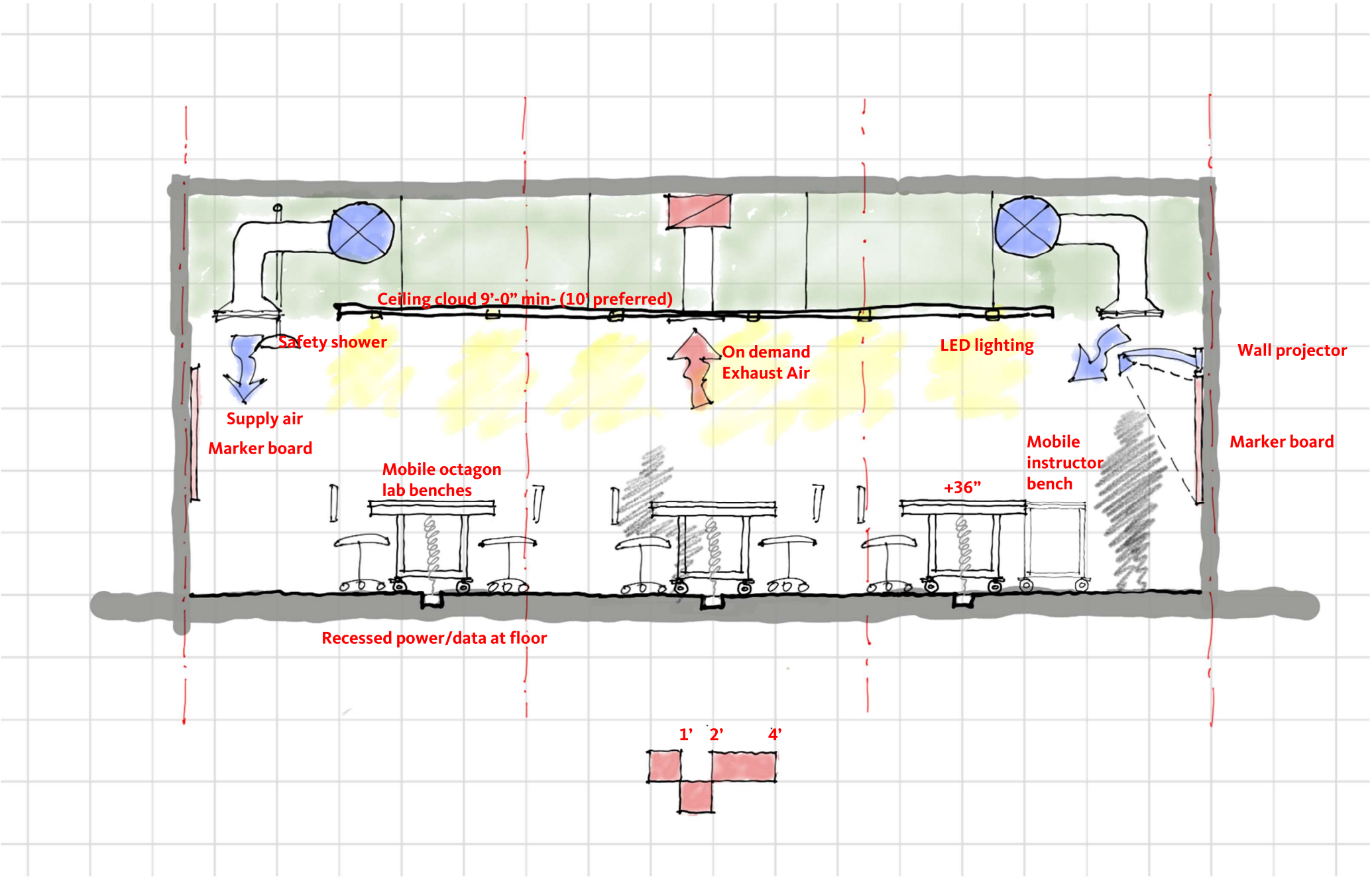
CONTRACTOR FURNISHED EQUIPMENT

- Octagon lab benches; Protean sink stations; Protean equipment stations
- Marker boards
- Monitors
- Instructor bench
- Safety shower/eyewash/fire ext

UNIVERSITY FURNISHED EQUIPMENT

- Refrigerators
- Freezers
- Microscopes
- Benchtop instruments
- Metro shelf units

SBS TEACHING LABORATORY
Concept Section



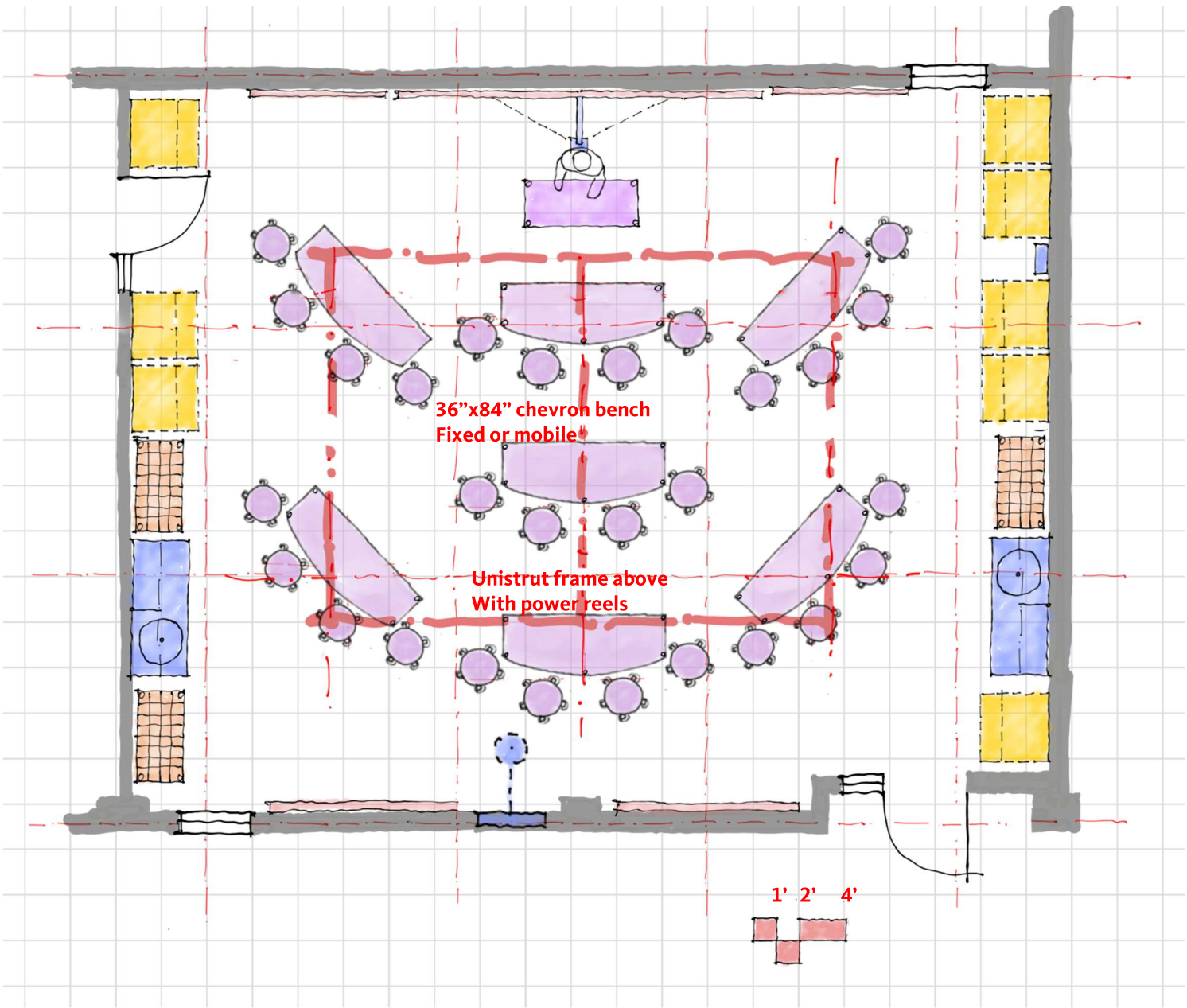
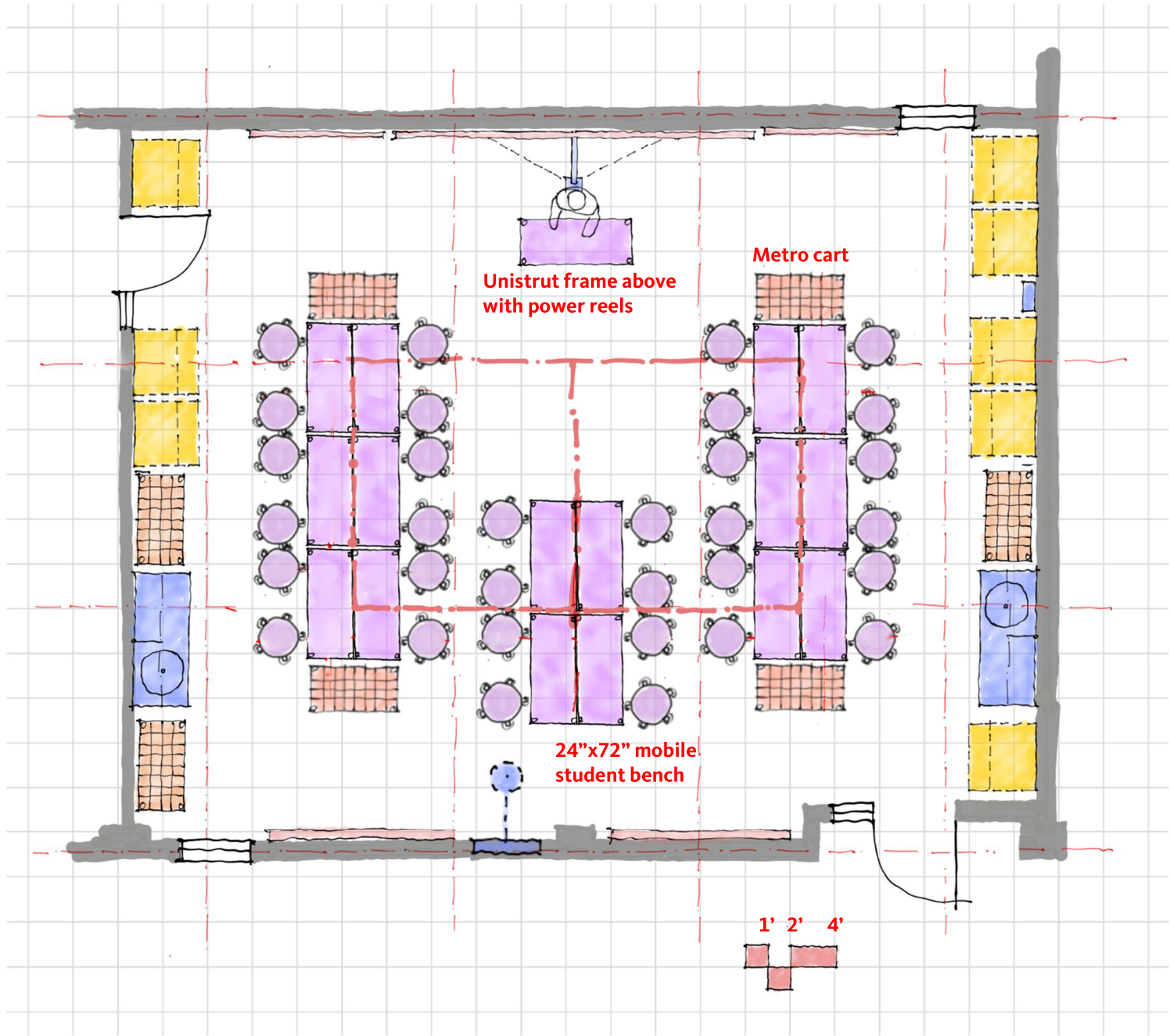
SBS TEACHING LABORATORY

Orthogonal & Chevron

24-32 students orthogonal

24-28 students chevron

Octagonal scheme is preferred.
Chevron and Orthogonal shown for reference/comparison.



SBS TEACHING LABORATORY

Octagon- 24-40 students

GENERAL

- Location: Eastlick, ground floor north side
- Function: Biology teaching lab
- Quantity: 5 lab
- Capacity: 1 instructor; 24-40 students
- Hours of operation: 6 am to midnight; 6 days per week
- Biosafety Level: 1

ARCHITECTURAL

- Floor: Sealed concrete or rubber tile; rubber base
- Walls: Metal stud, gypsum board, enamel paint
- Ceiling: 10' acoustic cloud, open at perimeter preferred; or wall to wall
- Doors: 3'-6"x8'-0" upper glass with metal frame
- Security: Card reader

STRUCTURAL

- Vibration Attenuation: 6,000 microinches per second or less
- Live Load: 125 lbs/sf
- Existing structure to prevail

MECHANICAL

- Temperature: 68-74 deg F +/- 2 deg F
- Humidity: Ambient
- Pressure: Negative to corridor
- Exhaust: On demand room exhaust with 30 minute shut-off
- Heat gain: 25 btuh/sf

PLUMBING

- Domestic water: Hot/Cold at lab sinks with vacuum breaker
- Pure Water: None
- Tepid Water: at safety shower/eyewash
- Floor Drain: at safety shower if possible
- Centrally piped gases: None
- Local cylinder gases: Insert gases as needed

ELECTRICAL

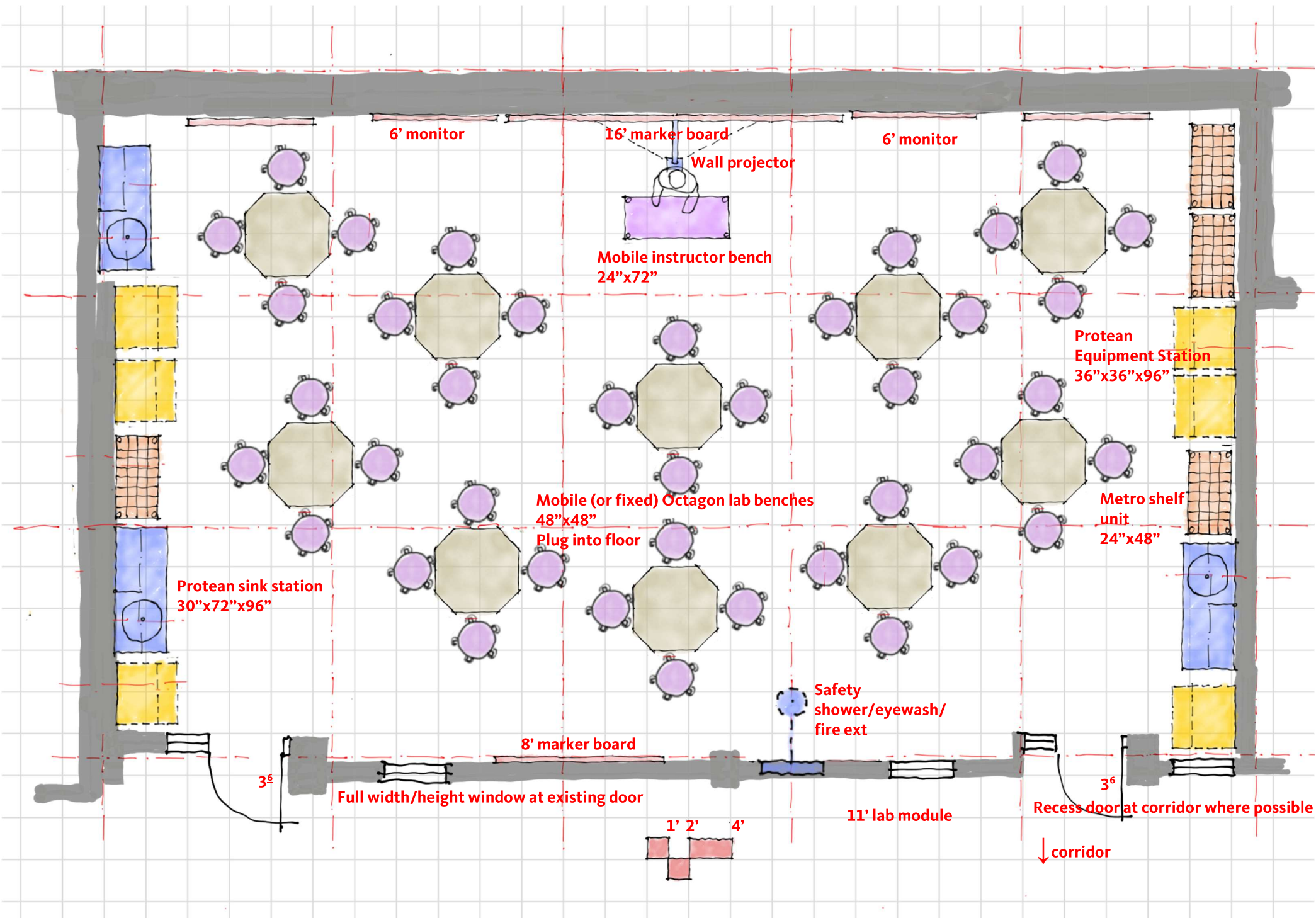
- Normal power: 115v20a dedicated circuits at octagon lab benches; duplex at perimeter at ~3' on center
- Standby power: at equipment space at 6' on center
- Lighting: LED at 500 LUX
- Data: Hardwire and wireless

CONTRACTOR FURNISHED EQUIPMENT

- Octagon lab benches; Protean sink stations; Protean equipment stations
- Marker boards
- Monitors
- Instructor bench
- Safety shower/eyewash/fire ext

UNIVERSITY FURNISHED EQUIPMENT

- Refrigerators
- Freezers
- Microscopes
- Benchtop instruments
- Metro shelf units



SBS PREP

GENERAL

- Location: Eastlick, ground floor south side
- Function: Teaching lab prep & storage
- Quantity: 1 room
- Capacity: 3-4 staff
- Hours of operation: 24/7/365
- Biosafety Level: One

ARCHITECTURAL

- Floor: Sealed concrete, rubber base; or epoxy resin integral base
- Walls: Metal stud, gypsum board, epoxy paint
- Ceiling: 10' acoustic mylar tile or open to structure
- Doors: 3'-6"x8'-0" upper glass with metal frame; 3'-0"/3'-0"x8'-0" pair upper glass with metal frame
- Security: Card reader

STRUCTURAL

- Vibration Attenuation: 6,000 microinches per second or less
- Live Load: 125 lbs/sf
- Existing structure to prevail

MECHANICAL

- Temperature: 68-74 deg F +/- 2 deg F
- Humidity: Ambient
- Pressure: Negative to corridor
- Exhaust: 100% exhaust at ceiling
- Heat gain: 50 btuh/sf

PLUMBING

- Domestic water: Hot/Cold at lab sinks with vacuum breaker
- Pure Water: RO unit for washer & autoclave
- Tepid Water: at safety shower
- Floor Drain: at washer & autoclave
- Centrally piped gases: None
- Local cylinder gases: None

ELECTRICAL

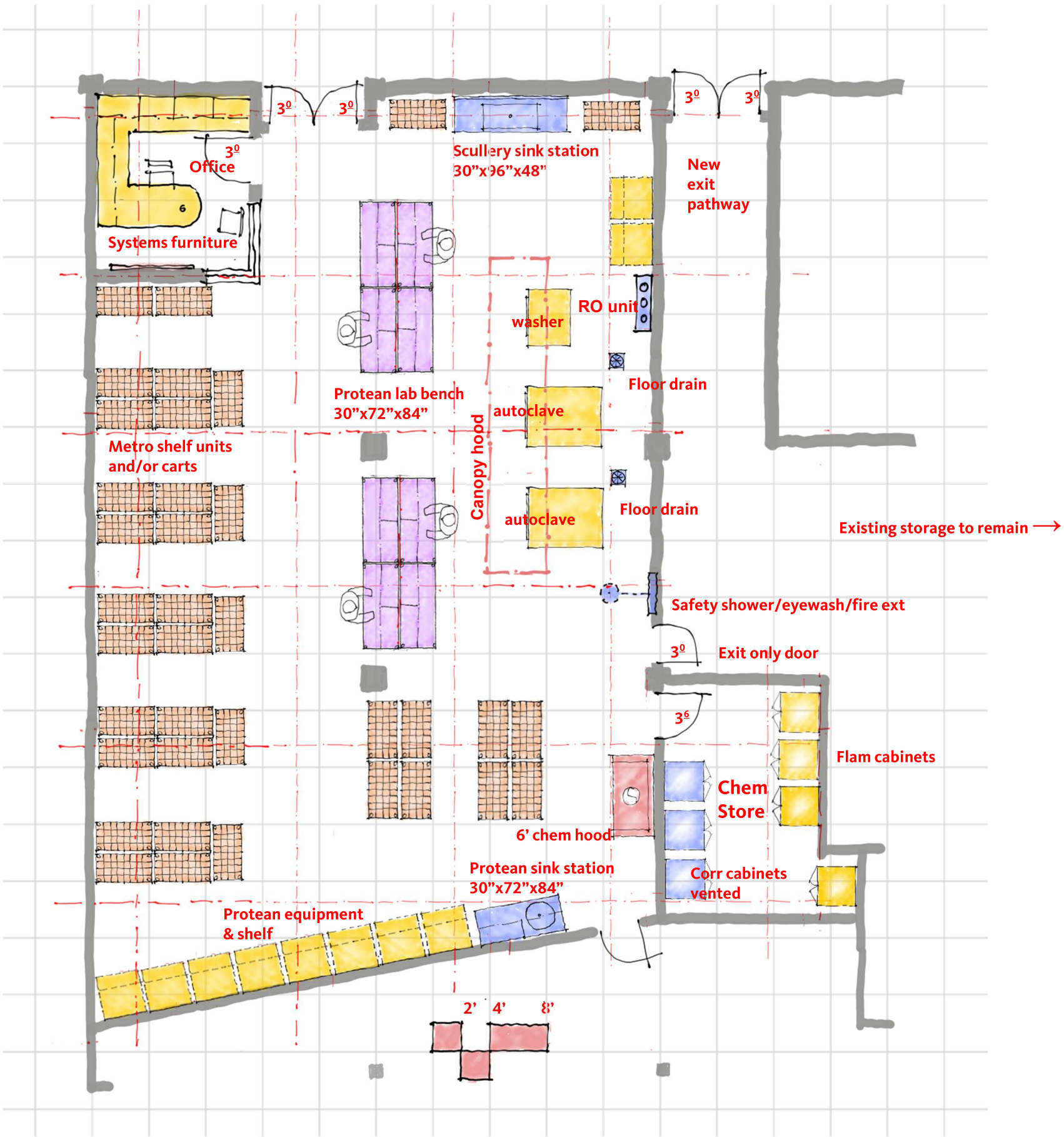
- Normal power: 115v20a convenience outlets at perimeter
- Standby power: 115v20a duplex at equipment space at 3' on center; 208v20a at equipment space at 6' on center; 480v50a at washer and autoclave
- Lighting: LED at 500 LUX
- Data: Hardwire and wireless

CONTRACTOR FURNISHED EQUIPMENT

- Protean lab benches, sink stations
- Chemical fume hood
- Autoclaves
- Washer
- Chemical storage cabinets
- Protean equipment/shelf units
- Safety shower/eyewash/fire ext

UNIVERSITY FURNISHED EQUIPMENT

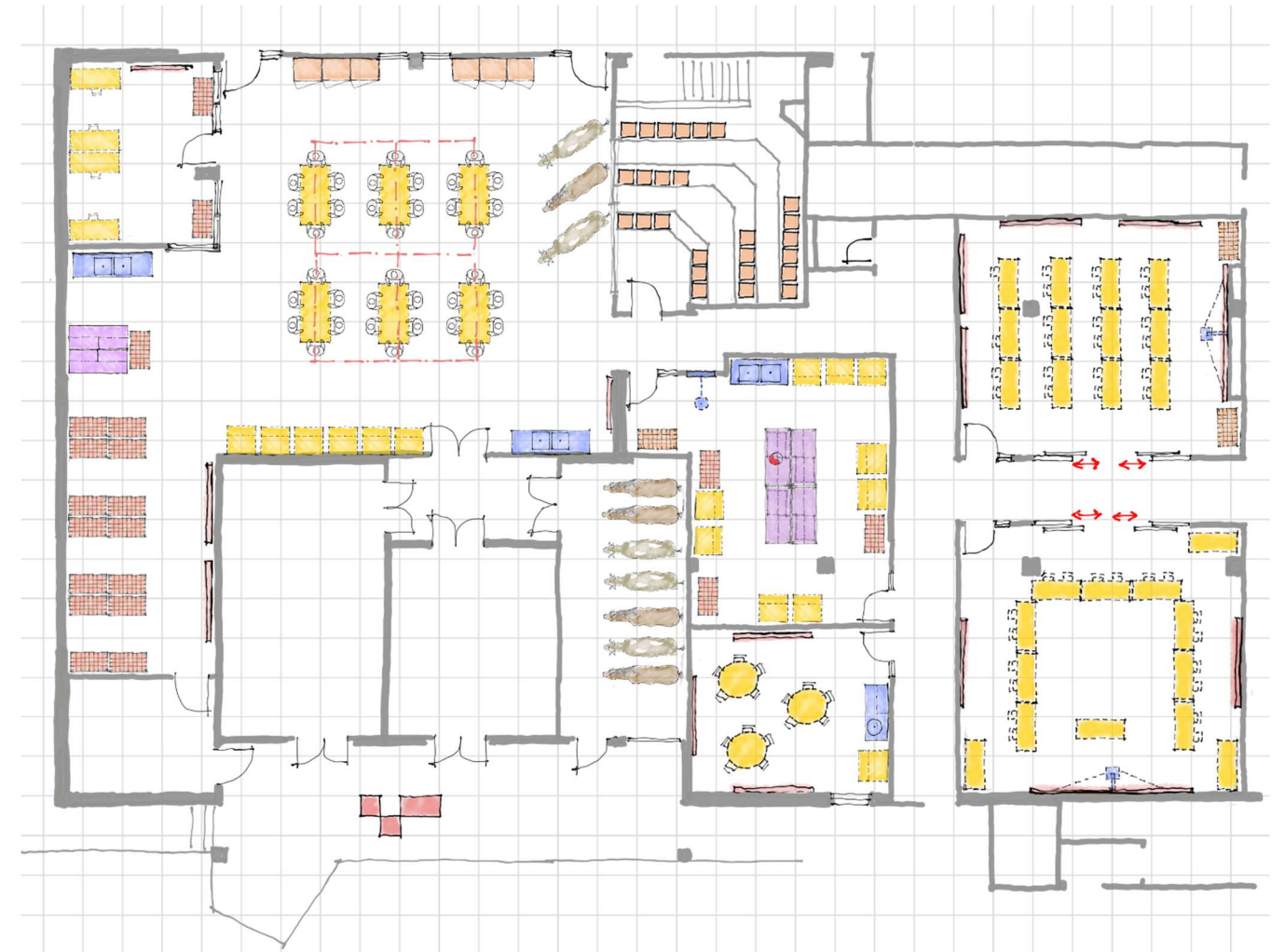
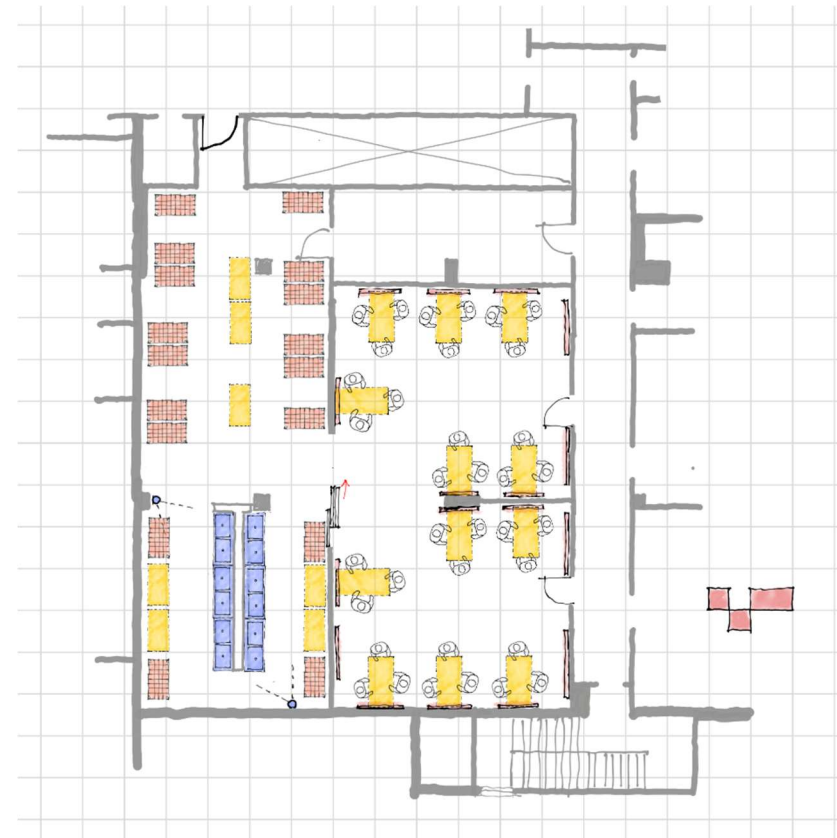
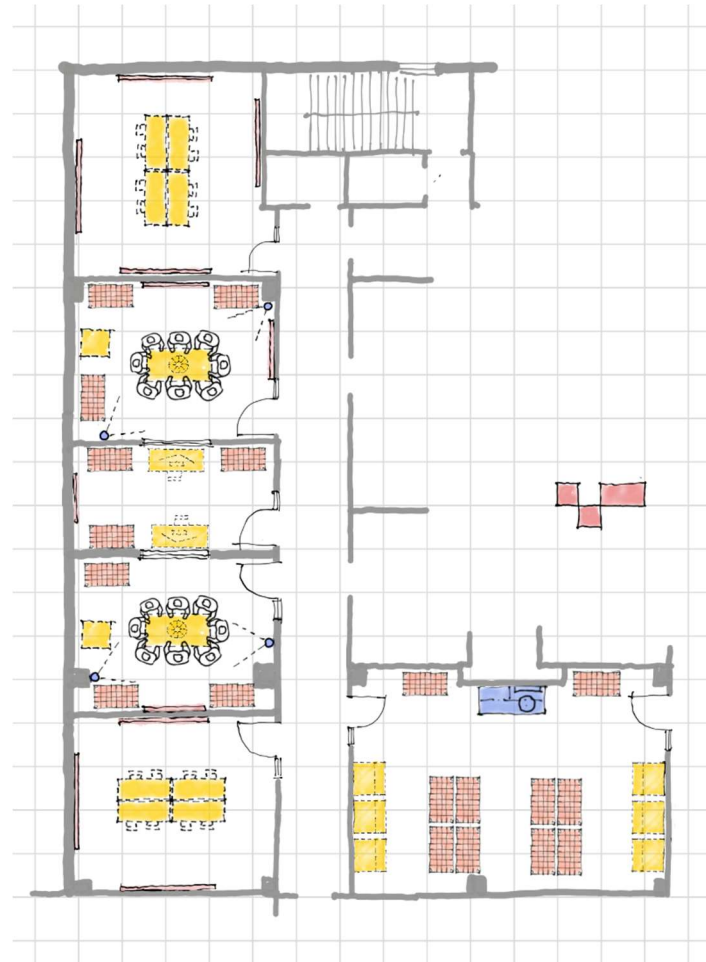
- Refrigerator
- Freezer
- Metro shelf units, carts
- Point-of-use water polisher
- Office systems furniture



Design Criteria Matrix- SBS Teaching Labs

Wash State Univ E-A-B Renovation as of 2023 Oct 28

Location		Eastlick Ground		24-28 Student Lab		Sim for 5 labs		24-40 Student Lab		North side		Prep		South Side		Criterion	
																General	



Vet Med Sim Lab Concepts

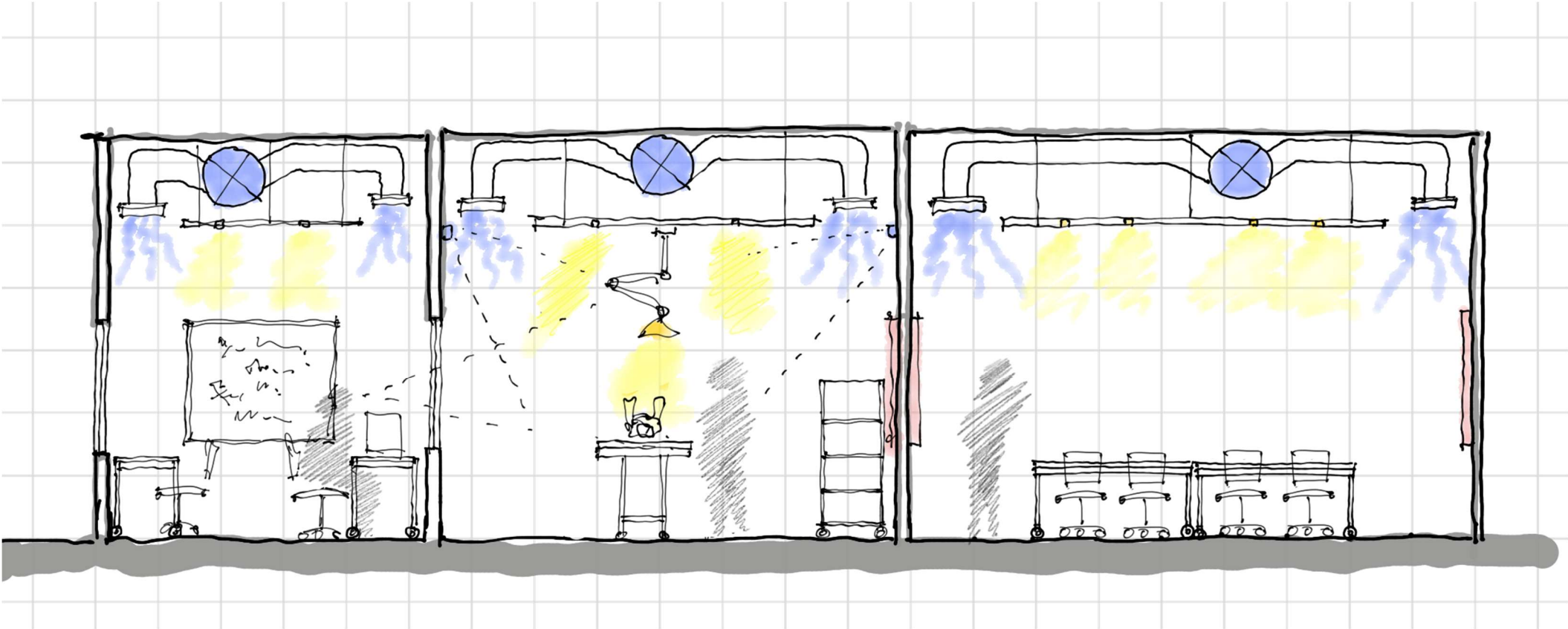
WSU E-A-B Renovation

Bustad L2, L1

2023 Oct 30

Andersen/ Gensler

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VET MED SIM SUITE: BUSTAD L2 NORTH

GENERAL

- Location: Bustad L2 North
- Function: Veterinary Simulation Instruction
- Quantity: 6 rooms in suite
- Capacity: 1 instructor; 6-8 students in each Simulation Room
- Hours of operation: 6 am to midnight; 6 days per week
- Biosafety Level: none

ARCHITECTURAL

- Floor: Sealed concrete or rubber tile; rubber base
- Walls: Metal stud, gypsum board, enamel paint
- Ceiling: 10' acoustic cloud, open at perimeter preferred; or wall to wall
- Doors: 3'-6"x8'-0" upper glass with metal frame
- Security: Card reader

STRUCTURAL

- Vibration Attenuation: 6,000 microinches per second or less
- Live Load: 125 lbs/sf
- Existing structure to prevail

MECHANICAL

- Temperature: 68-74 deg F +/- 2 deg F
- Humidity: Ambient
- Pressure: Neutral
- Exhaust: None
- Heat gain: 25 btuh/sf

PLUMBING

- Domestic water: Hot/Cold at Prep lab sink with vacuum breaker
- Pure Water: None
- Tepid Water: None
- Floor Drain: at safety shower if possible
- Centrally piped gases: None
- Local cylinder gases: O2 at anesthesia carts in Simulation Rooms

ELECTRICAL

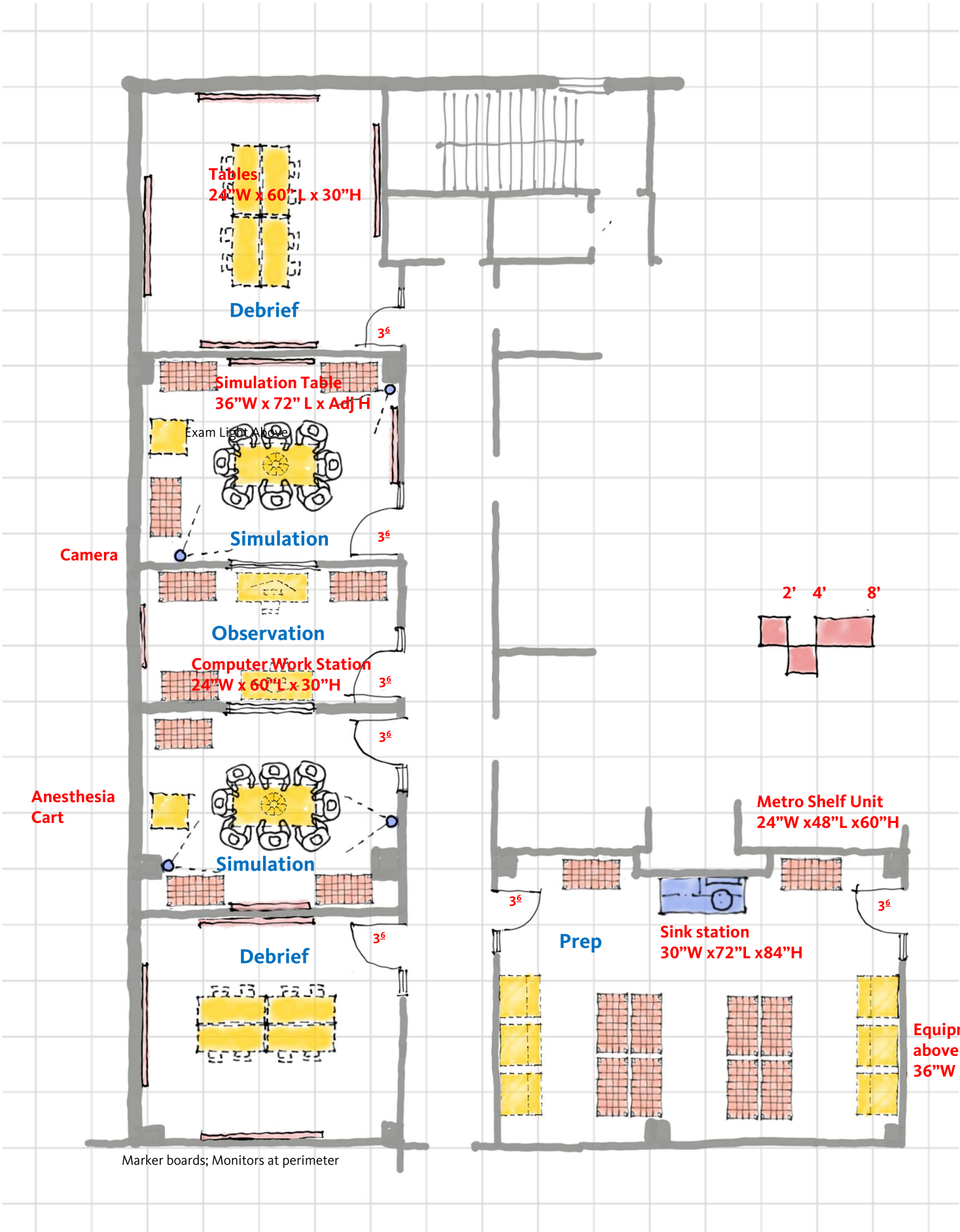
- Normal power: 115v20a dedicated circuits
- Standby power: None
- Lighting: LED at 500 LUX
- Data: Hardwire and wireless

CONTRACTOR FURNISHED EQUIPMENT

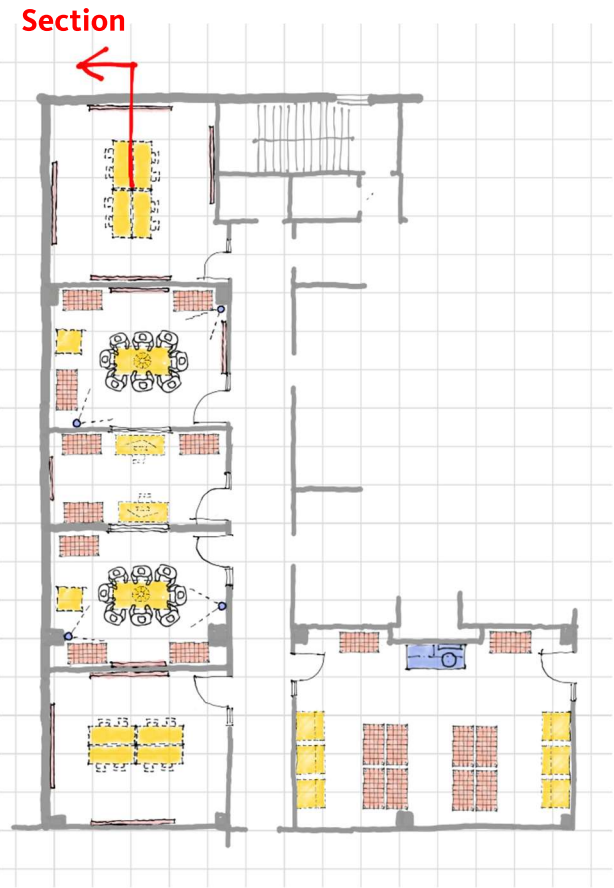
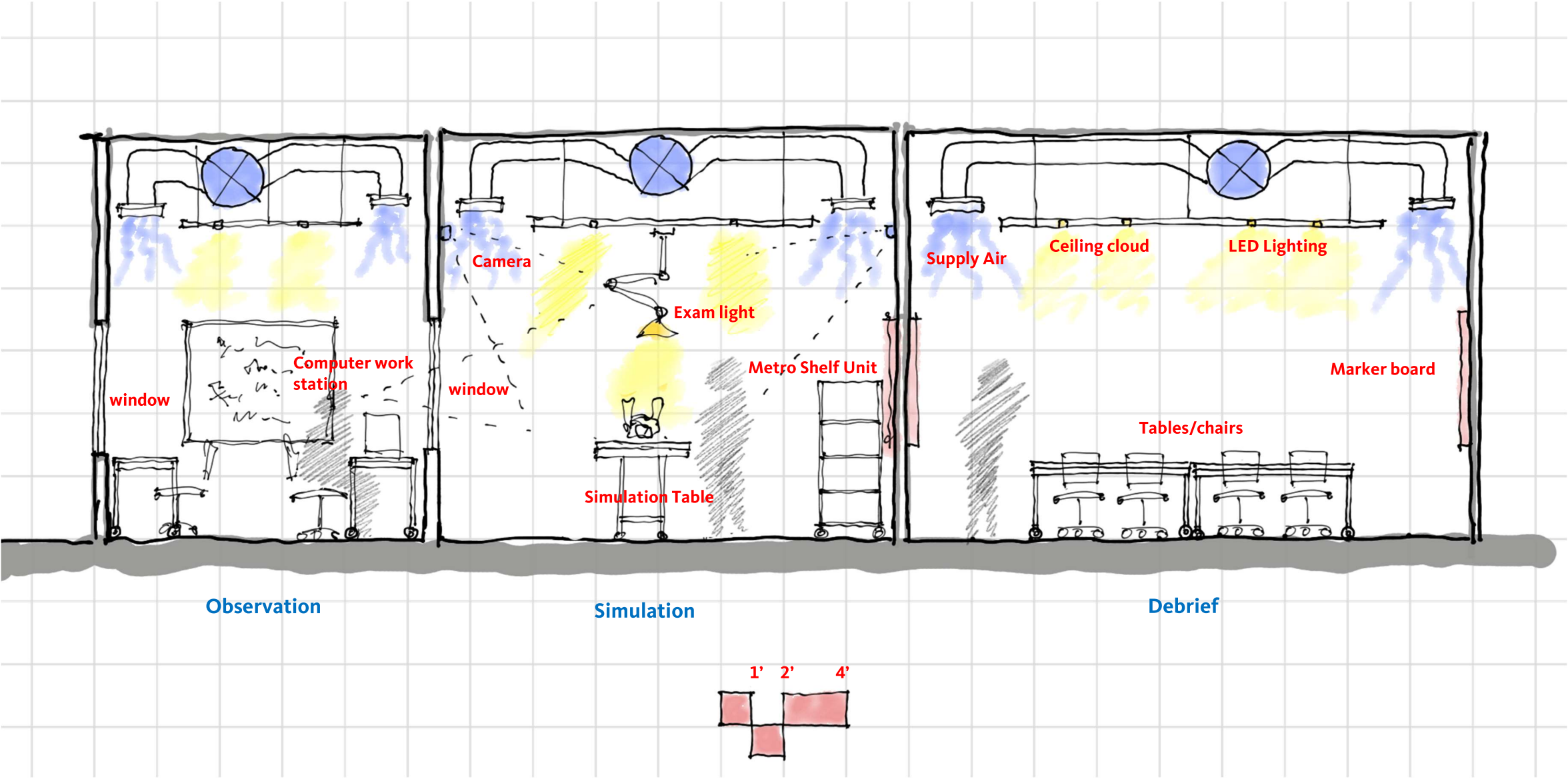
- Sink station in Prep Room
- Marker boards
- Cameras
- Exam light at Simulation Rooms

UNIVERSITY FURNISHED EQUIPMENT

- Simulation tables
- Tables & chairs
- Benchtop instruments
- Computers and monitors
- Metro shelf units



VET MED SIM SUITE: BUSTAD L2 NORTH
Concept Section



VET MED SIM SUITE: BUSTAD L2 SOUTH

GENERAL

- Location: Bustad L2 South
- Function: Veterinary Simulation Instruction
- Quantity: 2 rooms in suite
- Capacity: 1 instructor; 24-36 students
- Hours of operation: 6 am to midnight; 6 days per week
- Biosafety Level: None

ARCHITECTURAL

- Floor: Sealed concrete or rubber tile; rubber base
- Walls: Metal stud, gypsum board, enamel paint
- Ceiling: 10' acoustic cloud, open at perimeter preferred; or wall to wall
- Doors: 3'-6"x8'-0" upper glass with metal frame
- Security: Card reader

STRUCTURAL

- Vibration Attenuation: 6,000 microinches per second or less
- Live Load: 125 lbs/sf
- Existing structure to prevail

MECHANICAL

- Temperature: 68-74 deg F +/- 2 deg F
- Humidity: Ambient
- Pressure: Neutral
- Exhaust: None
- Heat gain: 25 btuh/sf

PLUMBING

- Domestic water: Hot/Cold at surgery sink stations
- Pure Water: None
- Tepid Water: None
- Floor Drain: None
- Centrally piped gases: None
- Local cylinder gases: O2 at anesthesia carts where required

ELECTRICAL

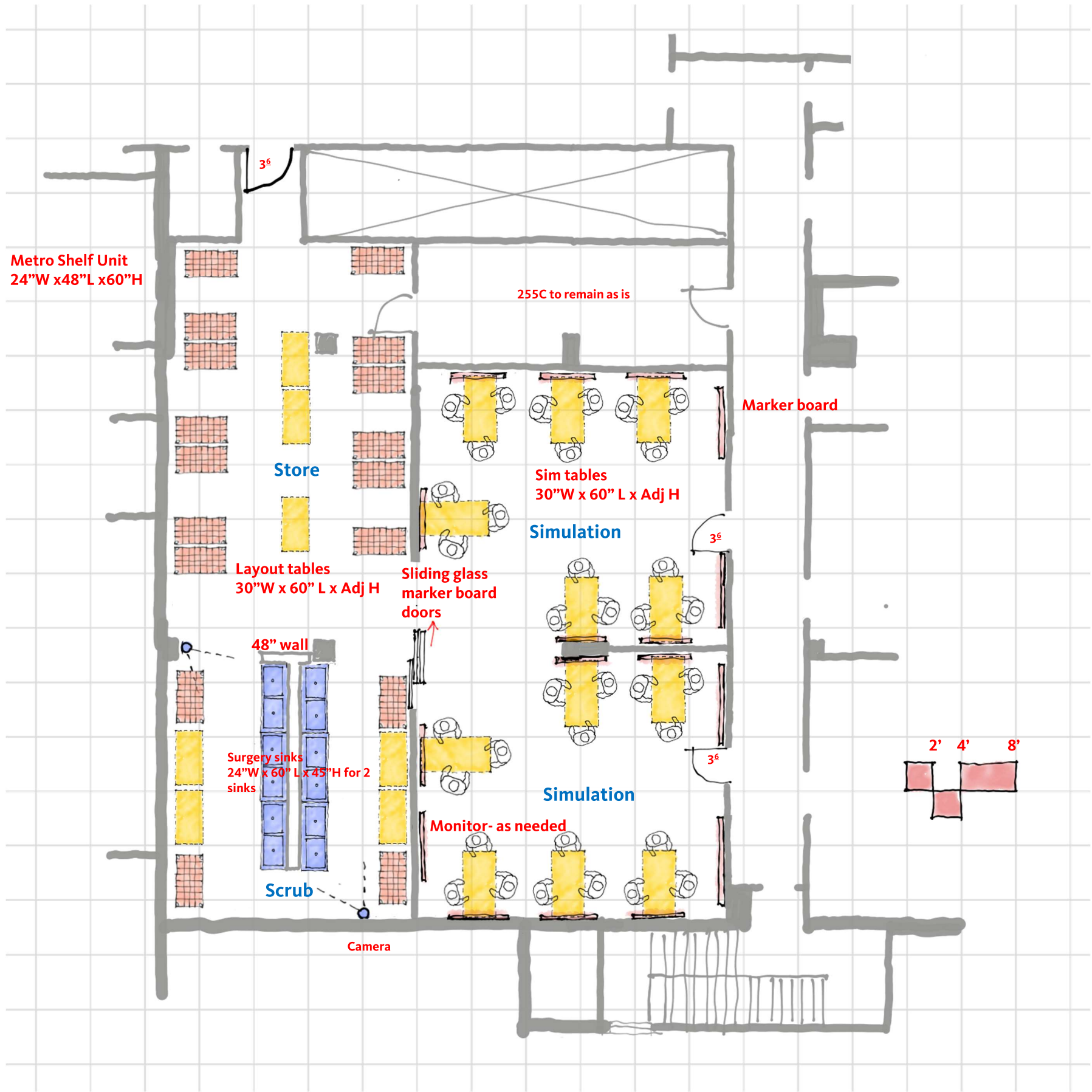
- Normal power: 115v20a dedicated circuits
- Standby power: None
- Lighting: LED at 500 LUX
- Data: Hardwire and wireless

CONTRACTOR FURNISHED EQUIPMENT

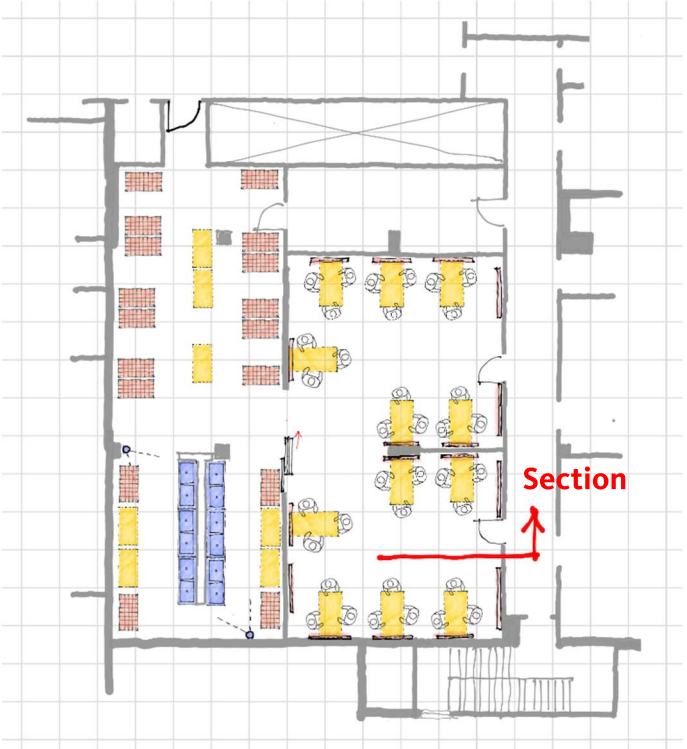
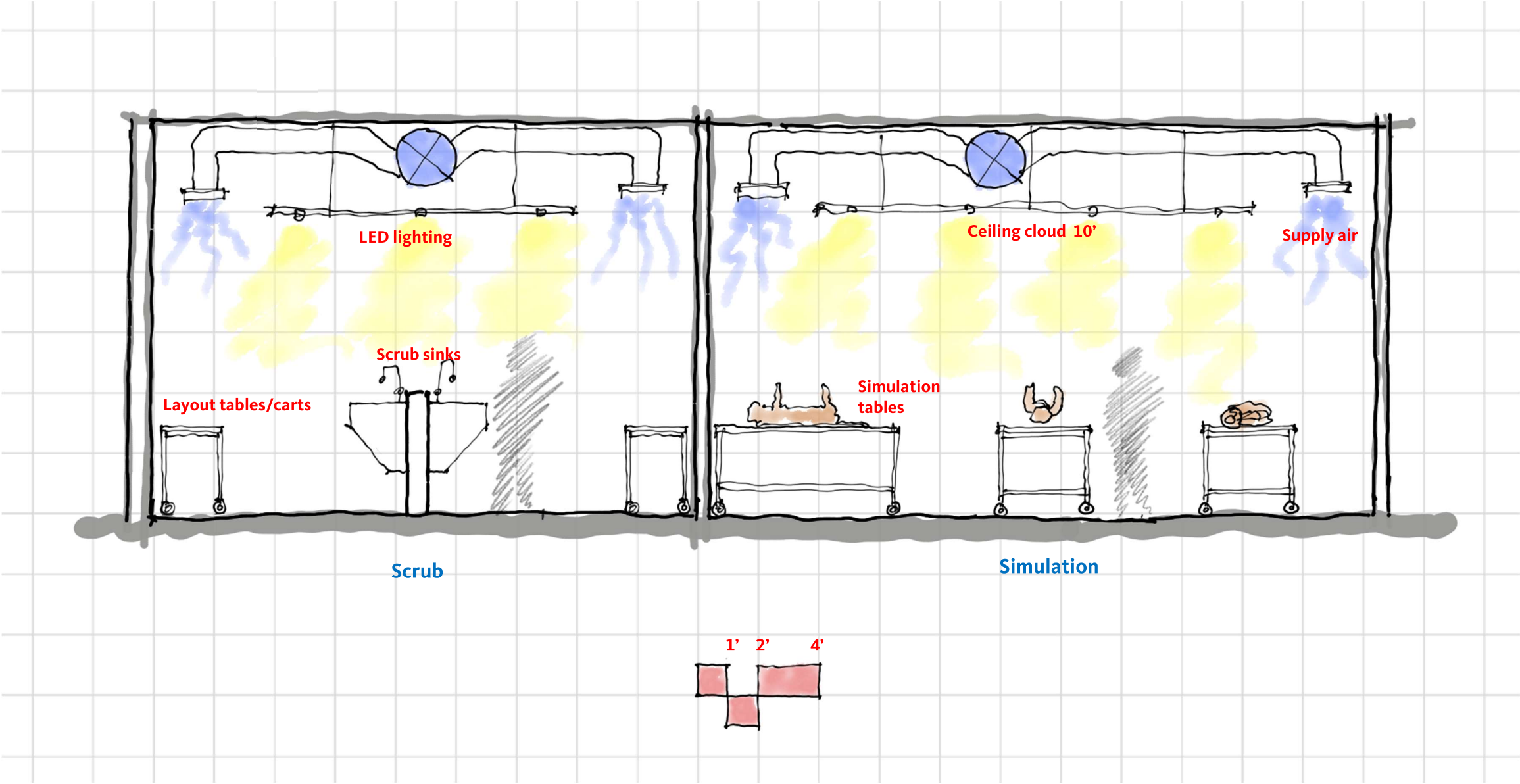
- Scrub sink stations
- Marker boards
- Cameras

UNIVERSITY FURNISHED EQUIPMENT

- Simulation tables
- Layout tables
- Monitors
- Benchtop instruments
- Metro shelf units



VET MED SIM SUITE: BUSTAD L2 SOUTH
Concept Section



VET MED SIM SUITE: BUSTAD L1 SOUTH

GENERAL

- Location: Eastlick, ground floor center
- Function: Veterinary simulation instruction
- Quantity: 8 rooms in one suite
- Capacity: 1 instructor; 24-36 students
- Hours of operation: 6 am to midnight; 6 days per week
- Biosafety Level: 1

ARCHITECTURAL

- Floor: Sealed concrete or rubber tile; rubber base
- Walls: Metal stud, gypsum board, enamel paint
- Ceiling: 10' acoustic cloud, open at perimeter preferred; or wall to wall; open to structure in main simulation lab
- Doors: 3'-6"x8'-0" upper glass with metal frame; Sliding marker glass doors at Conference Rooms
- Security: Card reader

STRUCTURAL

- Vibration Attenuation: 6,000 microinches per second or less
- Live Load: 125 lbs/sf
- Existing structure to prevail

MECHANICAL

- Temperature: 68-74 deg F +/- 2 deg F
- Humidity: Ambient
- Pressure: Neutral
- Exhaust: Snorkel exhaust in Work Shop
- Heat gain: 25 btuh/sf

PLUMBING

- Domestic water: Hot/Cold at lab sinks with vacuum breaker
- Pure Water: None
- Tepid Water: At safety shower in Workshop
- Floor Drain: at safety shower if possible
- Centrally piped gases: None
- Local cylinder gases: O2 at anesthesia carts

ELECTRICAL

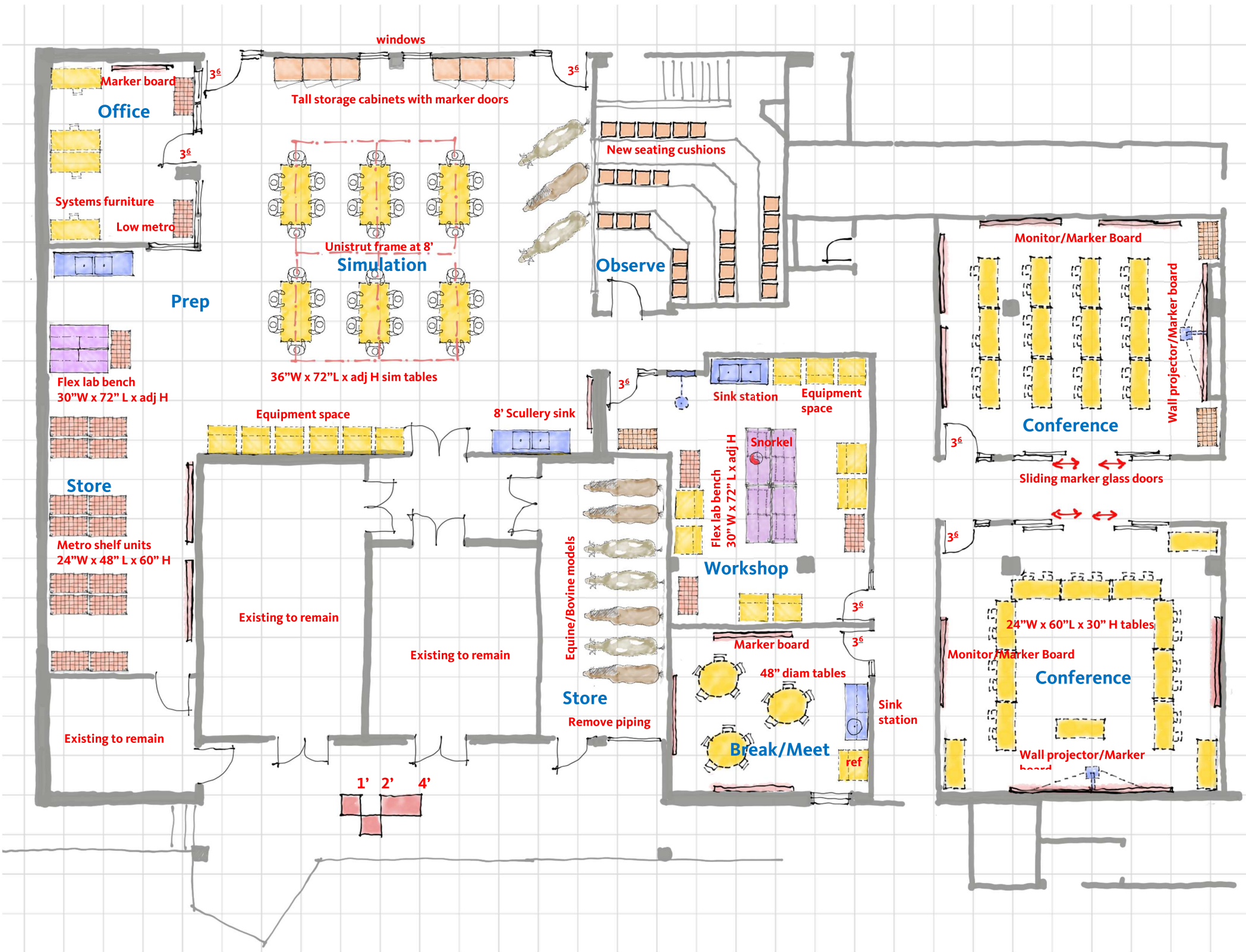
- Normal power: 115v20a dedicated circuits
- Standby power: None
- Lighting: LED at 500 LUX; 750 LUX shop lighting above simulation tables
- Data: Hardwire and wireless

CONTRACTOR FURNISHED EQUIPMENT

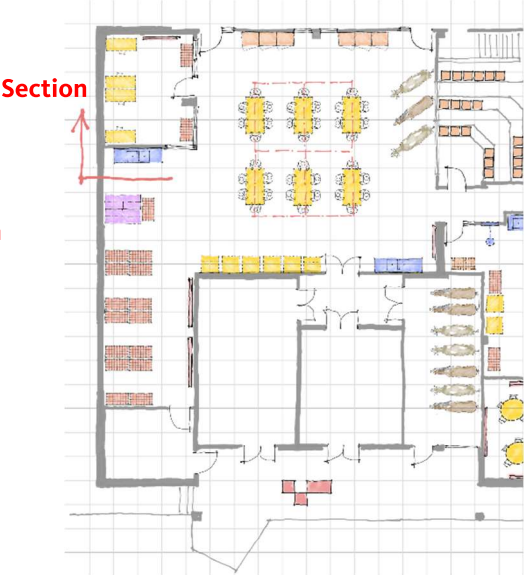
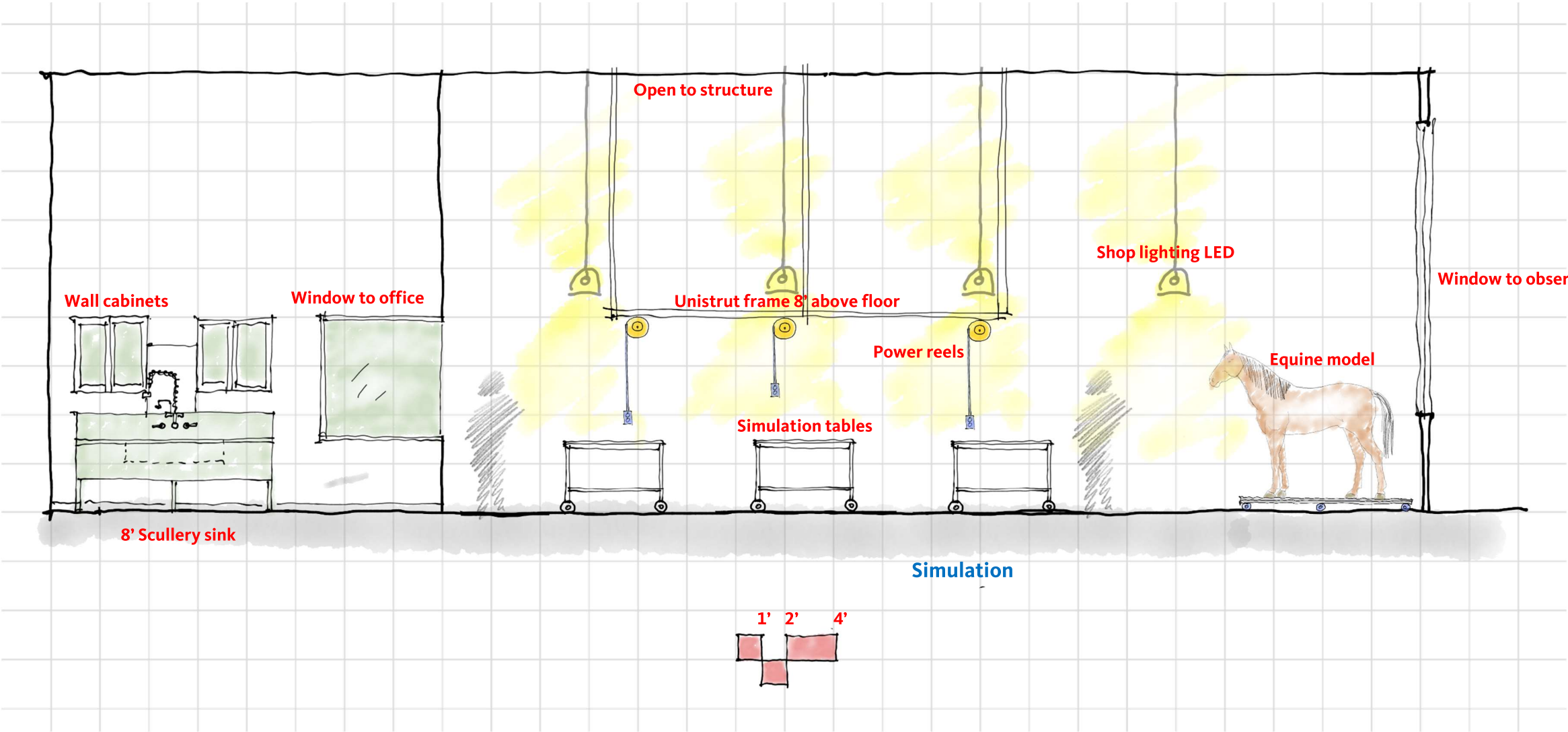
- Protean lab benches; sink stations
- Marker boards; Wall projectors
- Monitors
- Safety shower/eyewash/fire ext
- Snorkel exhaust in Work Shop
- New seating in Observation Room

UNIVERSITY FURNISHED EQUIPMENT

- Refrigerators
- Freezers
- Microscopes
- Benchtop instruments
- Metro shelf units
- Equine/Bovine models



VET MED SIM SUITE: BUSTAD L1 SOUTH
Concept Section



Design Criteria Matrix- Vet Med Sim Labs

Wash State Univ E-A-B Renovation as of 2023 Oct 30

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