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INNOVATION FORGE

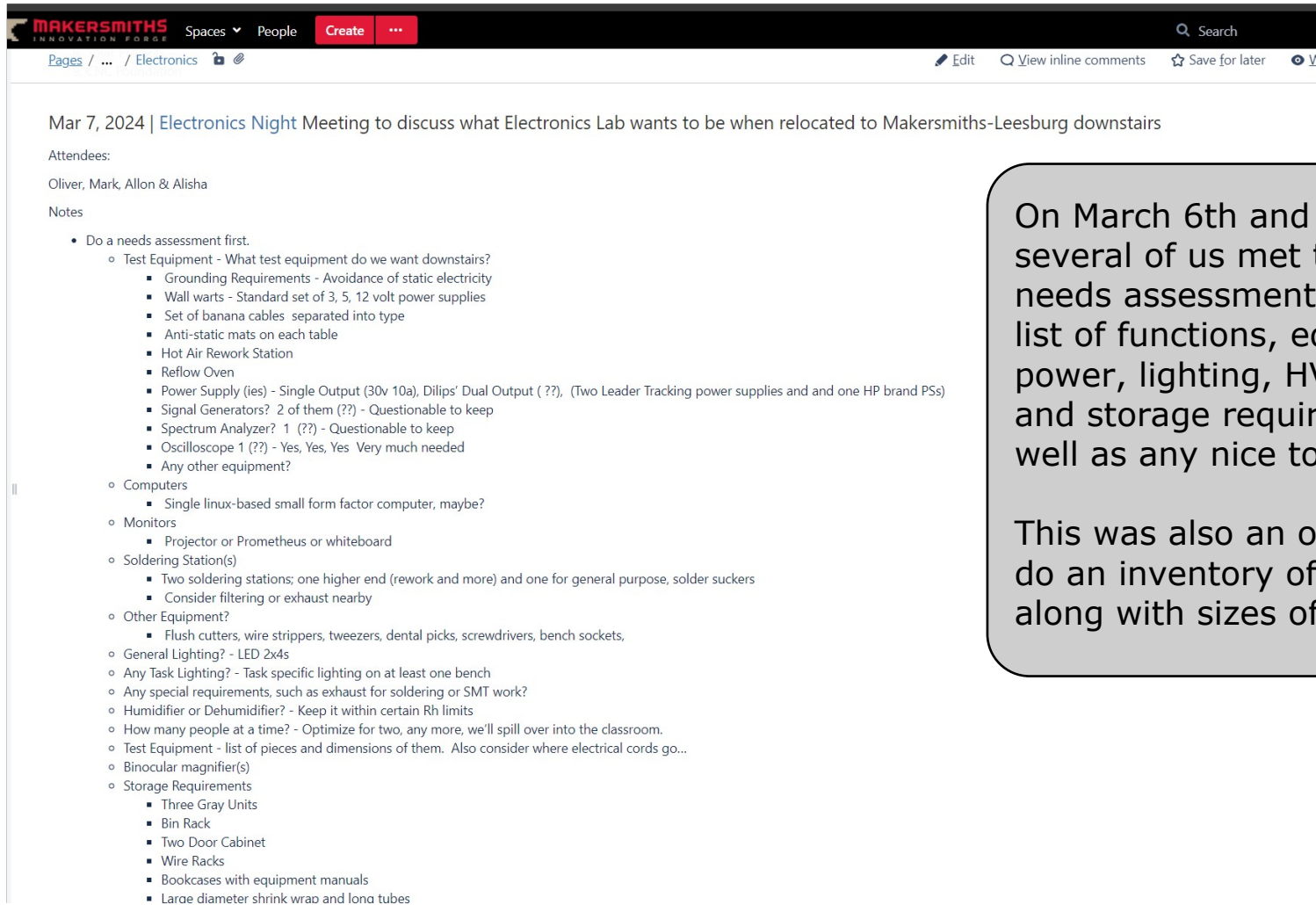## Basement Area Development

Process:

- **Needs Assessment**
- **Space Program**
- **Raw Floor Plan**
- **Early Sketches - Preliminary Design**
- **Final Floor Plan**
- **Final Design**
- **Cost Estimate**
- **Timeline**
- **Approval**
- **Execution**

Needs Assessment

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Pages / ... / Electronics   ✏ Edit   🔍 View inline comments   ☆ Save for later   👁 W

Mar 7, 2024 | Electronics Night Meeting to discuss what Electronics Lab wants to be when relocated to Makersmiths-Leesburg downstairs

Attendees:

Oliver, Mark, Allon & Alisha

Notes

- Do a needs assessment first.
  - Test Equipment - What test equipment do we want downstairs?
    - Grounding Requirements - Avoidance of static electricity
    - Wall warts - Standard set of 3, 5, 12 volt power supplies
    - Set of banana cables separated into type
    - Anti-static mats on each table
    - Hot Air Rework Station
    - Reflow Oven
    - Power Supply (ies) - Single Output (30v 10a), Dilips' Dual Output (??), (Two Leader Tracking power supplies and and one HP brand PSs)
    - Signal Generators? 2 of them (??) - Questionable to keep
    - Spectrum Analyzer? 1 (??) - Questionable to keep
    - Oscilloscope 1 (??) - Yes, Yes, Yes Very much needed
    - Any other equipment?
  - Computers
    - Single linux-based small form factor computer, maybe?
  - Monitors
    - Projector or Prometheus or whiteboard
  - Soldering Station(s)
    - Two soldering stations; one higher end (rework and more) and one for general purpose, solder suckers
    - Consider filtering or exhaust nearby
  - Other Equipment?
    - Flush cutters, wire strippers, tweezers, dental picks, screwdrivers, bench sockets,
  - General Lighting? - LED 2x4s
  - Any Task Lighting? - Task specific lighting on at least one bench
  - Any special requirements, such as exhaust for soldering or SMT work?
  - Humidifier or Dehumidifier? - Keep it within certain Rh limits
  - How many people at a time? - Optimize for two, any more, we'll spill over into the classroom.
  - Test Equipment - list of pieces and dimensions of them. Also consider where electrical cords go...
  - Binocular magnifier(s)
  - Storage Requirements
    - Three Gray Units
    - Bin Rack
    - Two Door Cabinet
    - Wire Racks
    - Bookcases with equipment manuals
    - Large diameter shrink wrap and long tubes

On March 6th and March 7th several of us met to create a needs assessment. Essentially a list of functions, equipment, power, lighting, HVAC, internet and storage requirements as well as any nice to haves.

This was also an opportunity to do an inventory of equipment along with sizes of equipment.

http://wiki.makersmiths.org/display/MAK/Downstairs+Elab+-+Discussions+and+Planning

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Space Program

Mar 11, 2024 | Translating the Electronics Night meeting notes into a planning document.

I've taken the below notes and translated them into a planning document. Please click on the **LINK HERE** to be linked to the spreadsheet. Please let me know if anyone has more comments. Regards, Mark
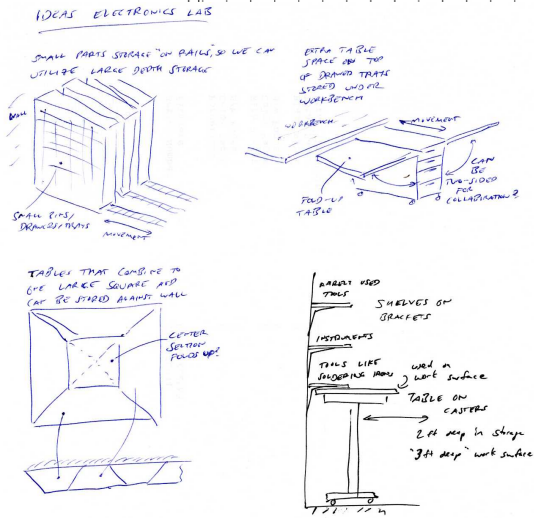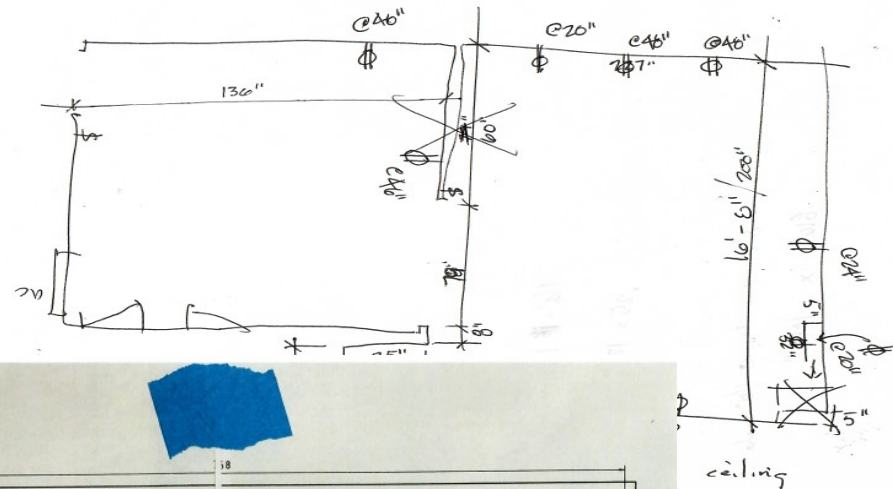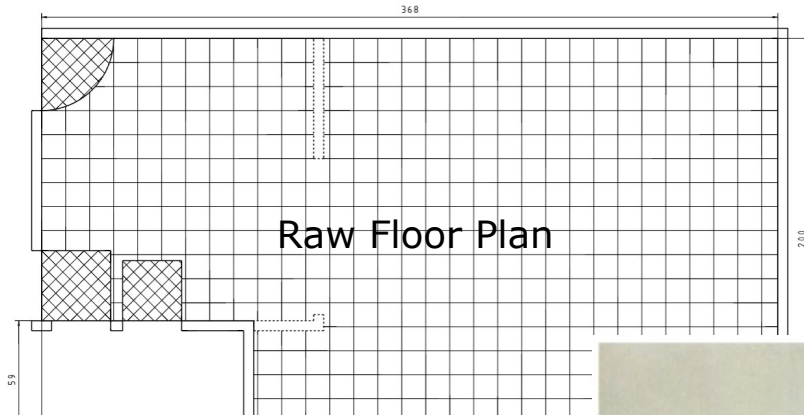
Latest Version of the ELab Draft Program - V1.0.gsheet

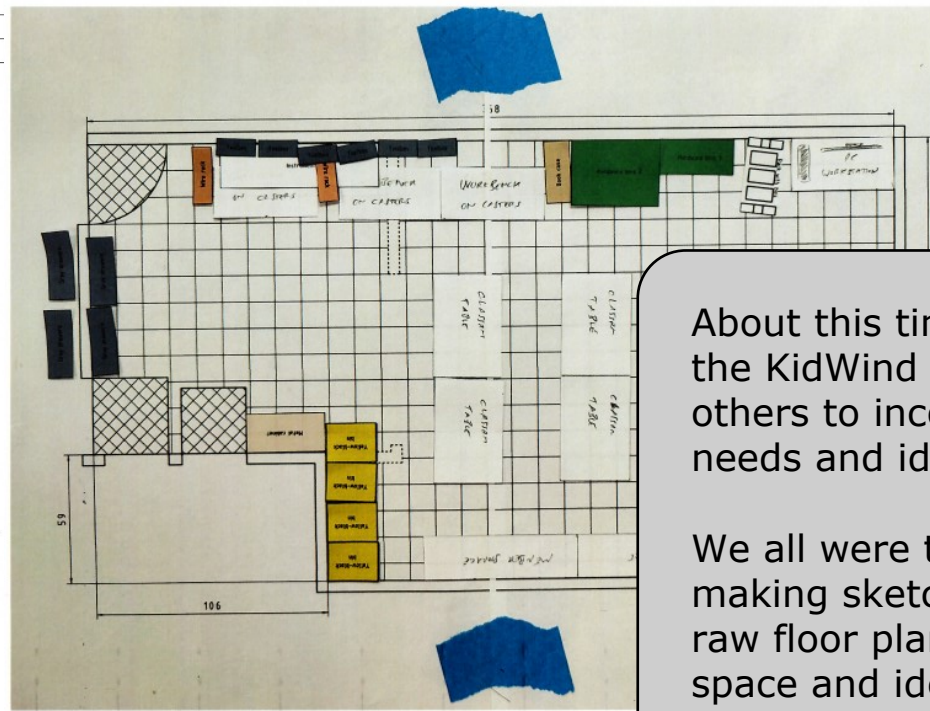| Area	Description	Activities	Equipment	Power / HVAC / Lighting Requirements	Adjacencies
Whole E-Lab			▪ Single, small-form factors computer ▪ Dual monitors with selectable inputs. Like classroom TV ▪ Projector & surface ▪ Whiteboard to draw upon ▪ Prometheus Board (wish list)	▪ Need to keep Rh within limits (?) ▪ At least one (1) 20amp circuit with two (2) quad outlets separated such that we can plug in at least two (2) fused power strips for various equipment ▪ Would prefer two (2) 20amp circuts	▪ Classroom - Room to spread out onto tables

Fabrication & Assembly	▪ Individual work on projects
	▪ Collaborative area that we can work face to face
	▪ Space to work on microcontrollers and SBC projects
		▪ Assembly for small projects, putting pieces together and/or putting pieces into project boxes or containers (ie., rockets, robots, etc., etc.)	▪ 30"x60" work surfaces
			▪ Static dissipative, grounded surface.
			▪ Hard surface for cutting, pounding, heating, etc. (needs to be durable)
			▪ Handtools nearby - pegboard or clearly labeled bins or drawers (will have to decide on what tools this means)(see * below)
			▪ Ethernet hard drop(s)
			▪ Two soldering stations;
			  ▪ one higher end (rework and more) and
			  ▪ one general purpose
			▪ Pano-vices / Chip Holders, e.g. KOTTIO Holding Hands
			▪ PCB preheater - 110v 600watt, e.g. this one
			▪ Hot Air Rework Station
			▪ Reflow Oven
				▪ Where do we ground to?
				▪ Filtration or Ventilation for soldering and/or solvents
				▪ Ambient Air Temp - between 68 and 72degrees
				▪ Moveable task lighting
				▪ Solderi... ventila...
				Solder...
					▪ Classroom or large table area for group events - Groups, Teams, Presentations (KidWind, Rocket Teams, Robot Teams, etc.)
					▪ Flexible in configuration to accomodate different sized things

Testing		▪ Testing of proto-type products	▪ Ethernet hard drop(s) ▪ 30"x60" work surface ▪ Binocular magnifier ▪ Electrical Cords ▪ Testing banana cables ▪ 30v 10a power supply ▪ Dilip's dual power supply ▪ (2 Leader tracking power supplies) ▪ (HP power supply) ▪ Signal Generator (Questionable to...		

The Needs Assessment was then transformed into a Space Program, which is essentially a listing in table format.

The Space Program was also organized to list the essential 'functional' areas the new overall space would serve.

http://wiki.makersmiths.org/display/MAK/Downstairs+Elab+-+Discussions+and+Planning

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Raw Floor & Early Sketches
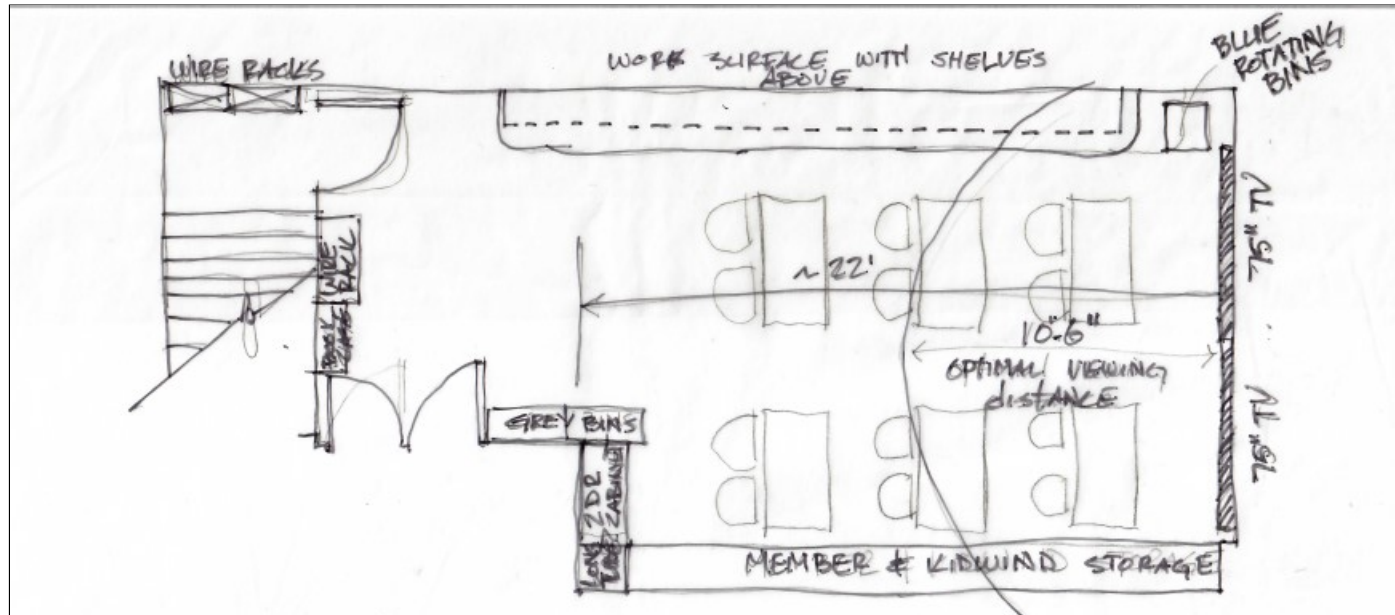
Raw Floor Plan

Storage and Table
Ideas

About this time we pulled in the KidWind coaches and others to incorporate their needs and ideas.

We all were tasked with making sketches using the raw floor plan to layout the space and ideas for arrangements keeping the Space Program in mind.

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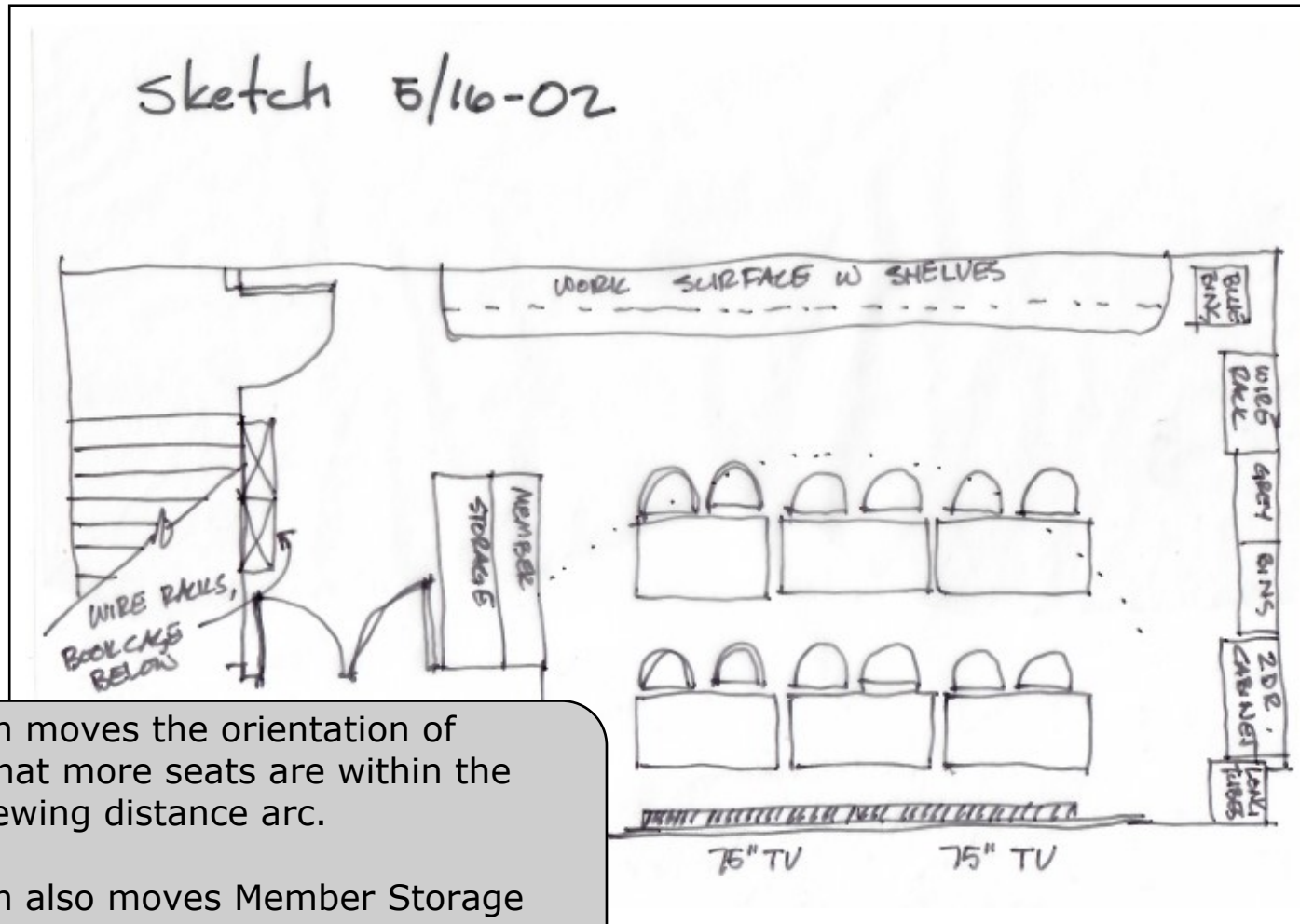
May 16th - Sketch 01

Sketch 5/16-01

Early sketches were further refined . . .
This sketch lays everything out around
the perimeter of the sapce (removing the
non-load bearing walls).

Note the optimal viewing distance arc for
TV monitors is 10'-6" for 75" monitor

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May 16th - Sketch 02

This sketch moves the orientation of desks so that more seats are within the optimal viewing distance arc.

This sketch also moves Member Storage closer to entrance so that member bins can be accessed without disturbing classes or events going on in larger room.
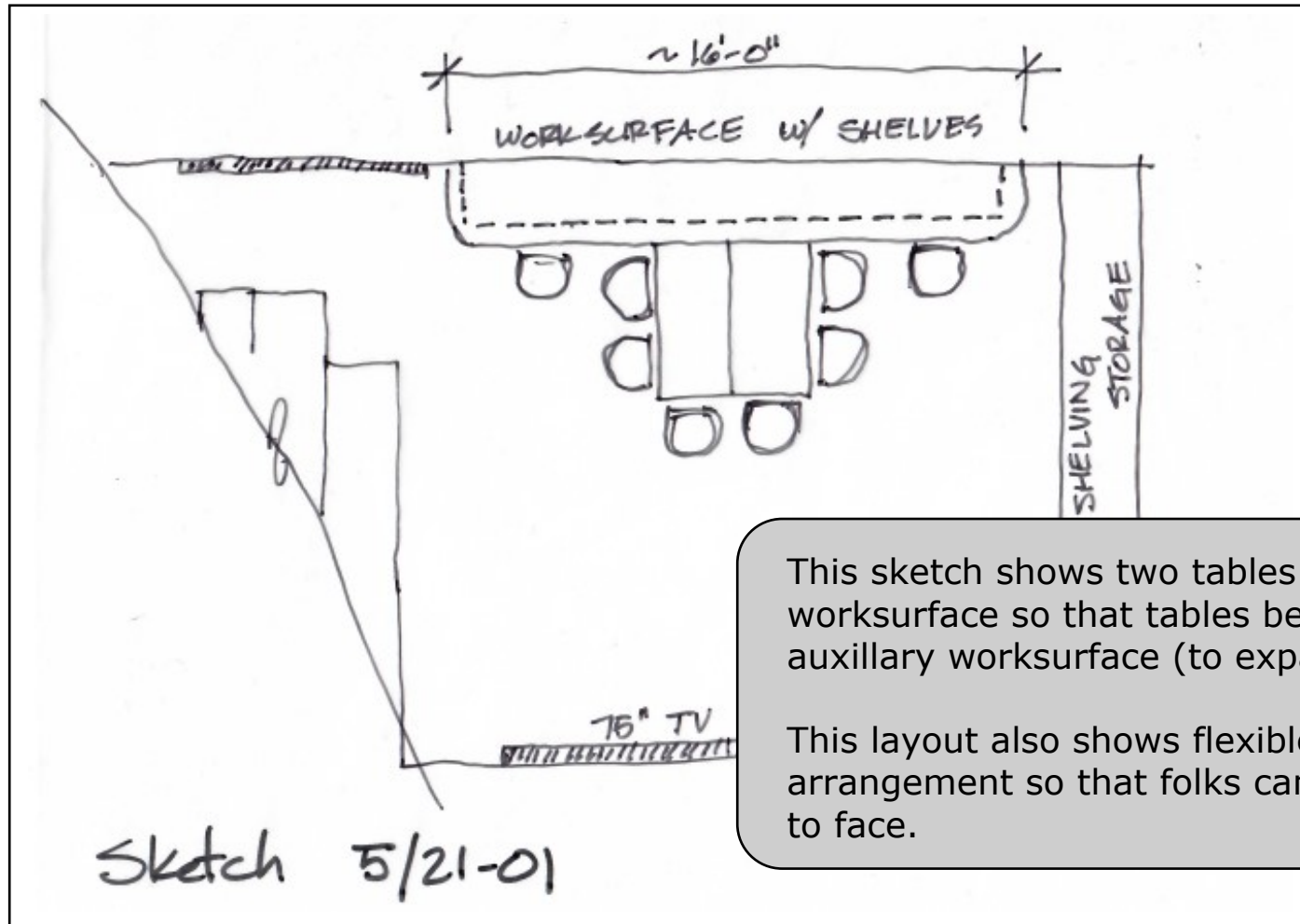
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May 16th - Sketch 03

Sketch 5/16-03
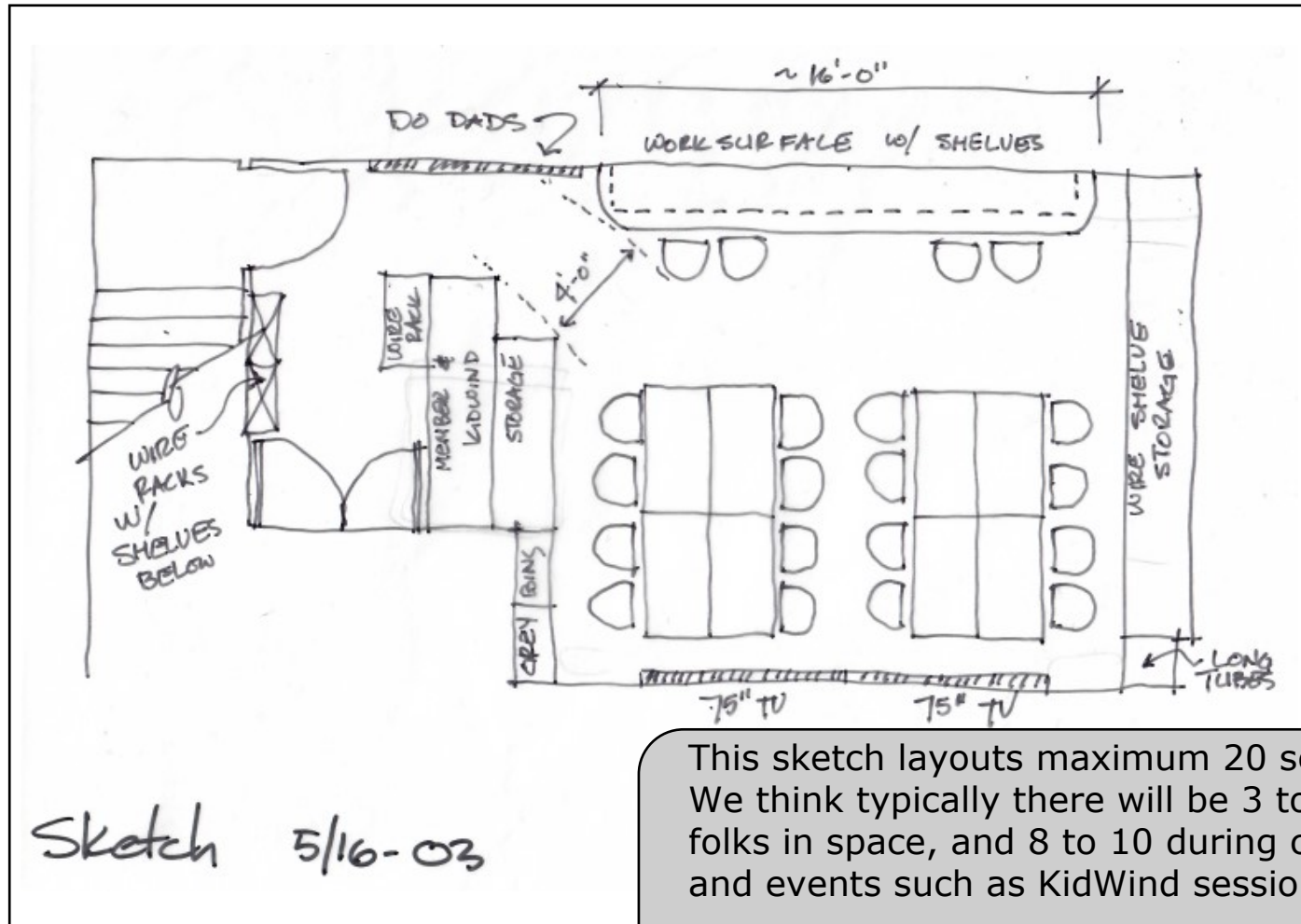
This sketch layouts maximum 20 seats. We think typically there will be 3 to 5 folks in space, and 8 to 10 during classes and events such as KidWind sessions.

If nesting tables and seats are used there could be an approximate 15' x 18' open space in middle of room for activities.

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May 21st - Sketch 01

~ 16'-0"

WORKSURFACE W/ SHELVES

SHELVING STORAGE

75" TV

Sketch 5/21-01

This sketch shows two tables butted to worksurface so that tables become auxillary worksurface (to expand on).

This layout also shows flexible arrangement so that folks can work face to face.

Proposed Design

These next few pages show the proposed floor plan layout similar to Sketch 5-16-03, but showing seating for 12.

Member Storage is located on the left side, accessible to folks without having to go into the larger room. Wire spools, bookcase and a flip-up table are on the far left wall. Peg Board on north wall along with main workbench and two shelves above for equipment, kits, and light storage.
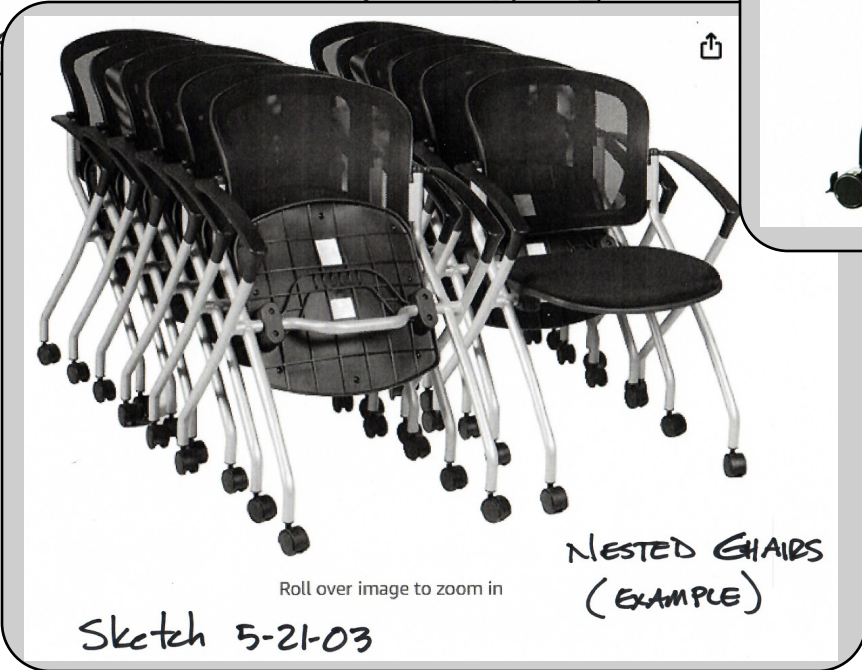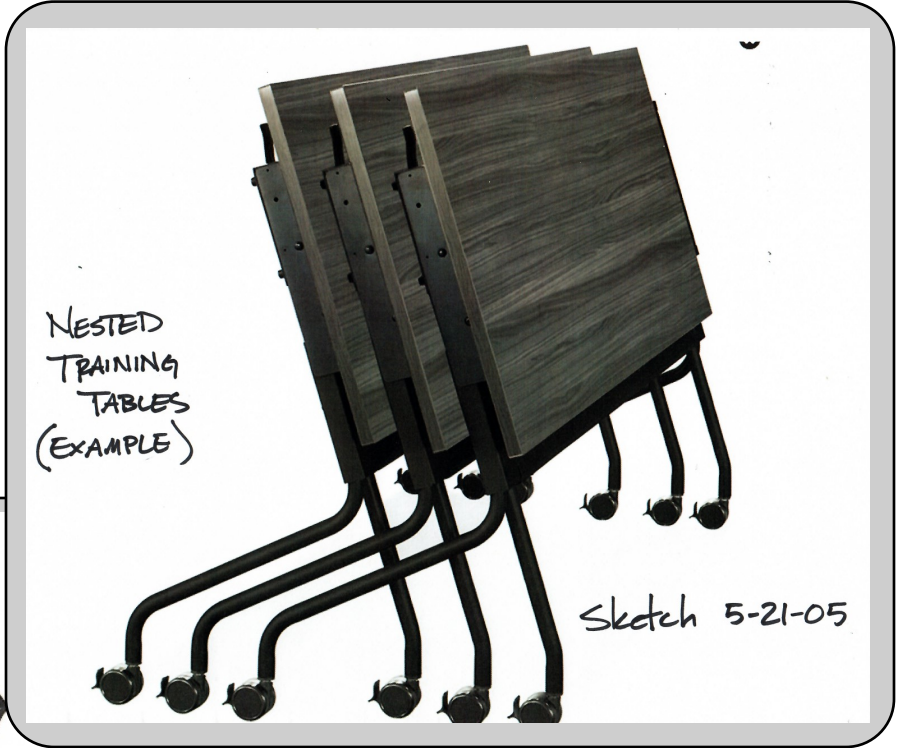
East wall shows wire shelving for site storage, general storage and miscellaneous electrical items along with long item storage such as heat shrink tubes, plug mold, outlet strips.

South wall contains the two 75" monitors (biggest we can fit down the stairs I think) and the cubby lockers that were formally in the lobby area.

Grey drawer bins with electrical components are shown to the left, on the wall outside of the restroom.

Table sizes are 2'x4', on castors, and both they and the chairs are nesting type. Examples shown on next page.

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Nesting Tables & Chairs

Training Tables w/ Chairs

Sketch...

Nested Training Tables (Example)

Sketch 5-21-05

Roll over image to zoom in

Nested Chairs (Example)

Sketch 5-21-03

Examples of Nested Training Tables and Nested Chairs.

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Wire Spool Rack,
Bookshelves Below,
Folding Table Below

• Plastic
Bins
Rack

• Member
Storage
Shelves

• Ped Board
On Wall

• Long Workbench
Below Equipment
Shelves

• Light
Equipment
Shelves

• Wire Storage
Shelves (typical)
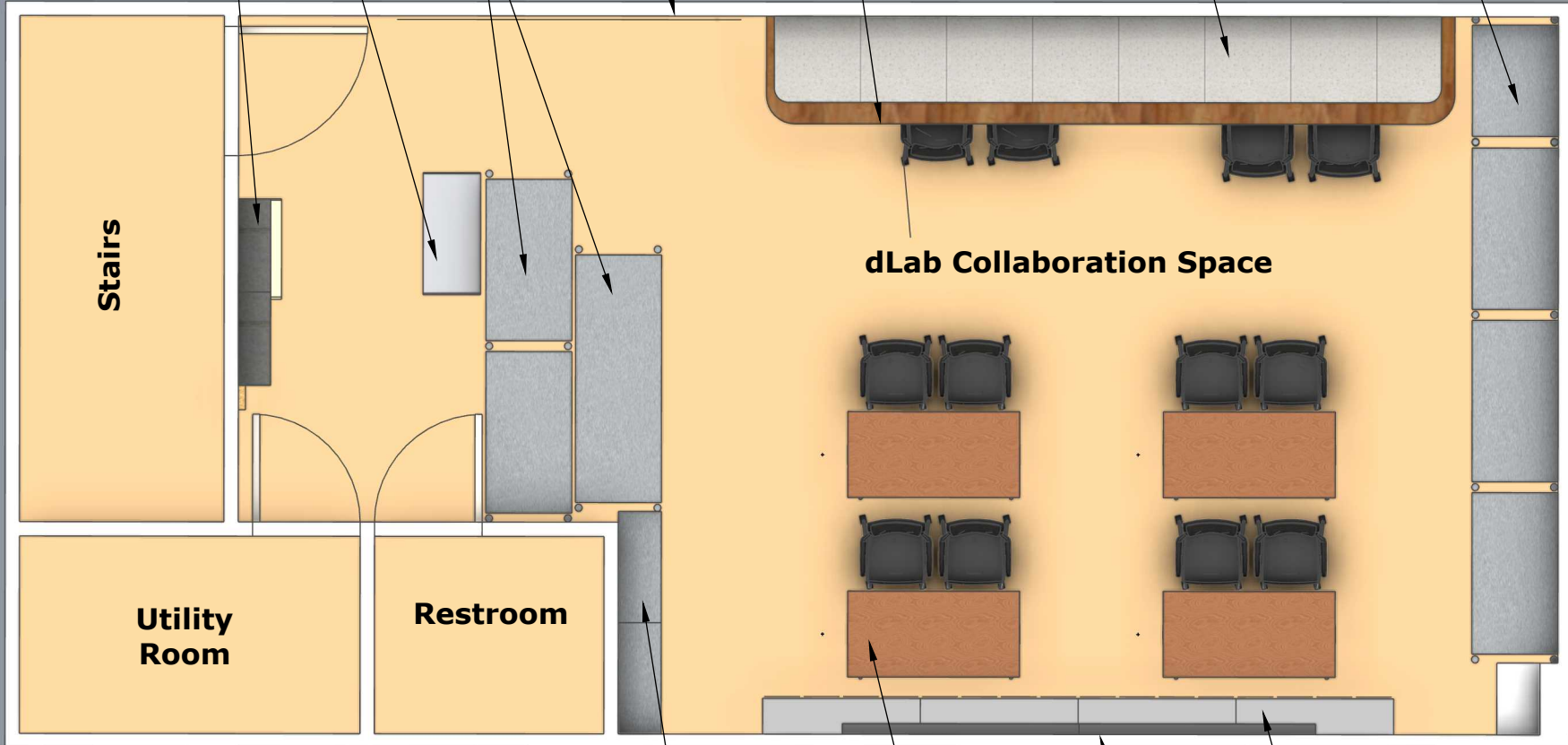
Stairs

dLab Collaboration Space

**Utility
Room**

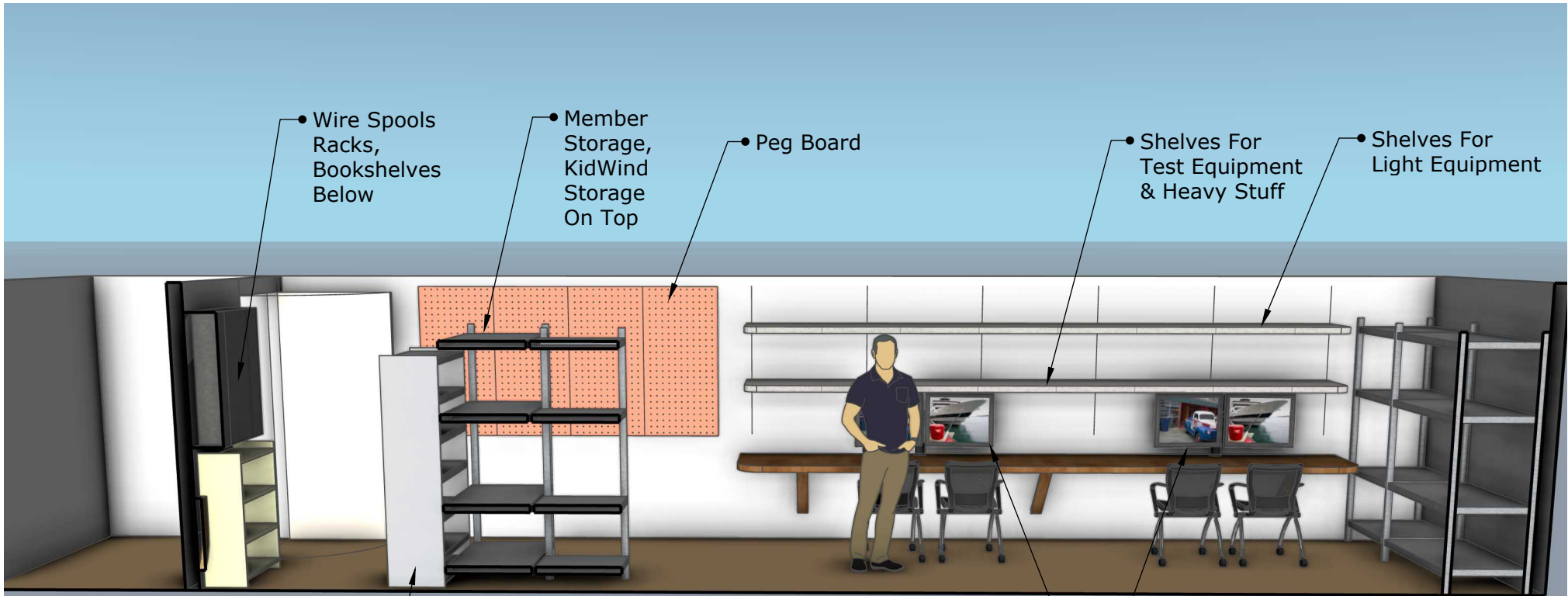**Restroom**

• Grey Drawer
Bins
(need one from
metal shop?)

• Nesting
Tables &
Chairs
(24"x48" top)

• Two 75"
Monitors
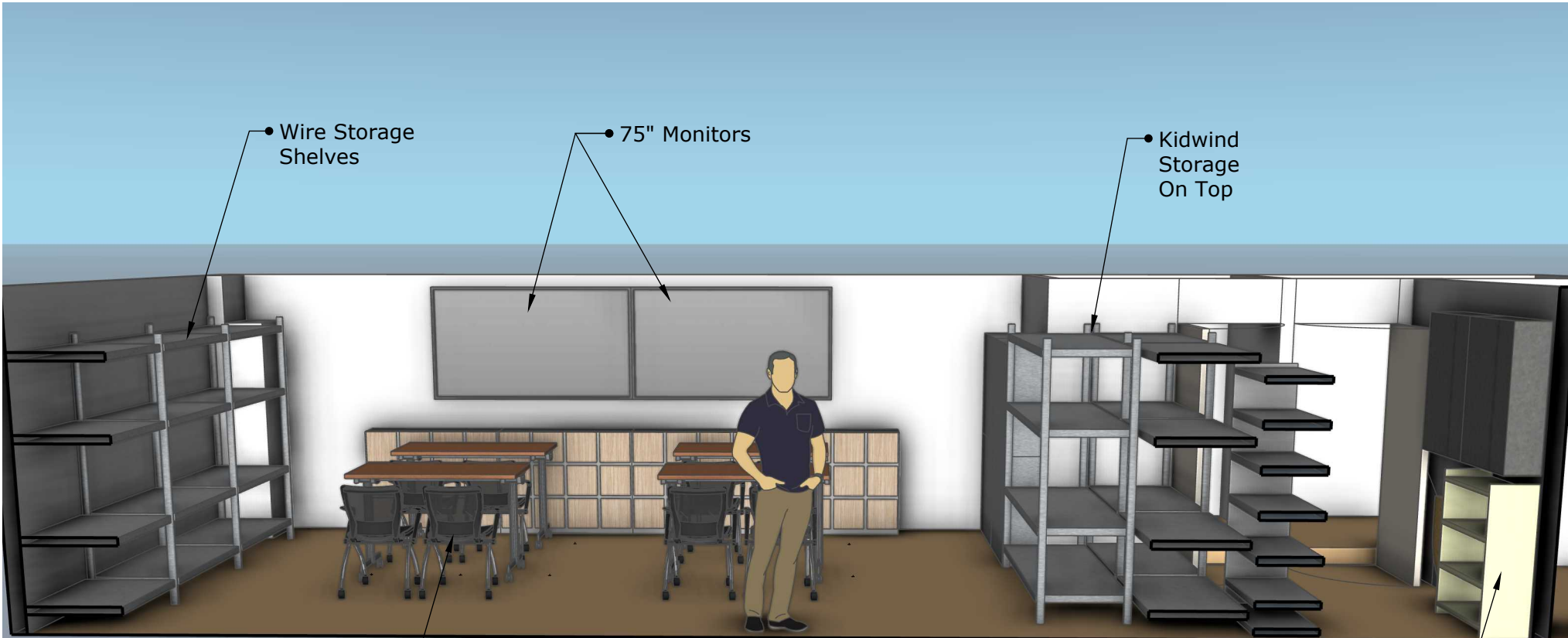(66"x37"x3"
actual size)

• Cubby Lockers
From Lobby

N

Floor Plan - Seating for 12

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Wire Spools
Racks,
Bookshelves
Below

Member
Storage,
KidWind
Storage
On Top

Peg Board

Shelves For
Test Equipment
& Heavy Stuff

Shelves For
Light Equipment

Plastic Bins
Rack

Workstations
With Dual
Monitors

North Elevation

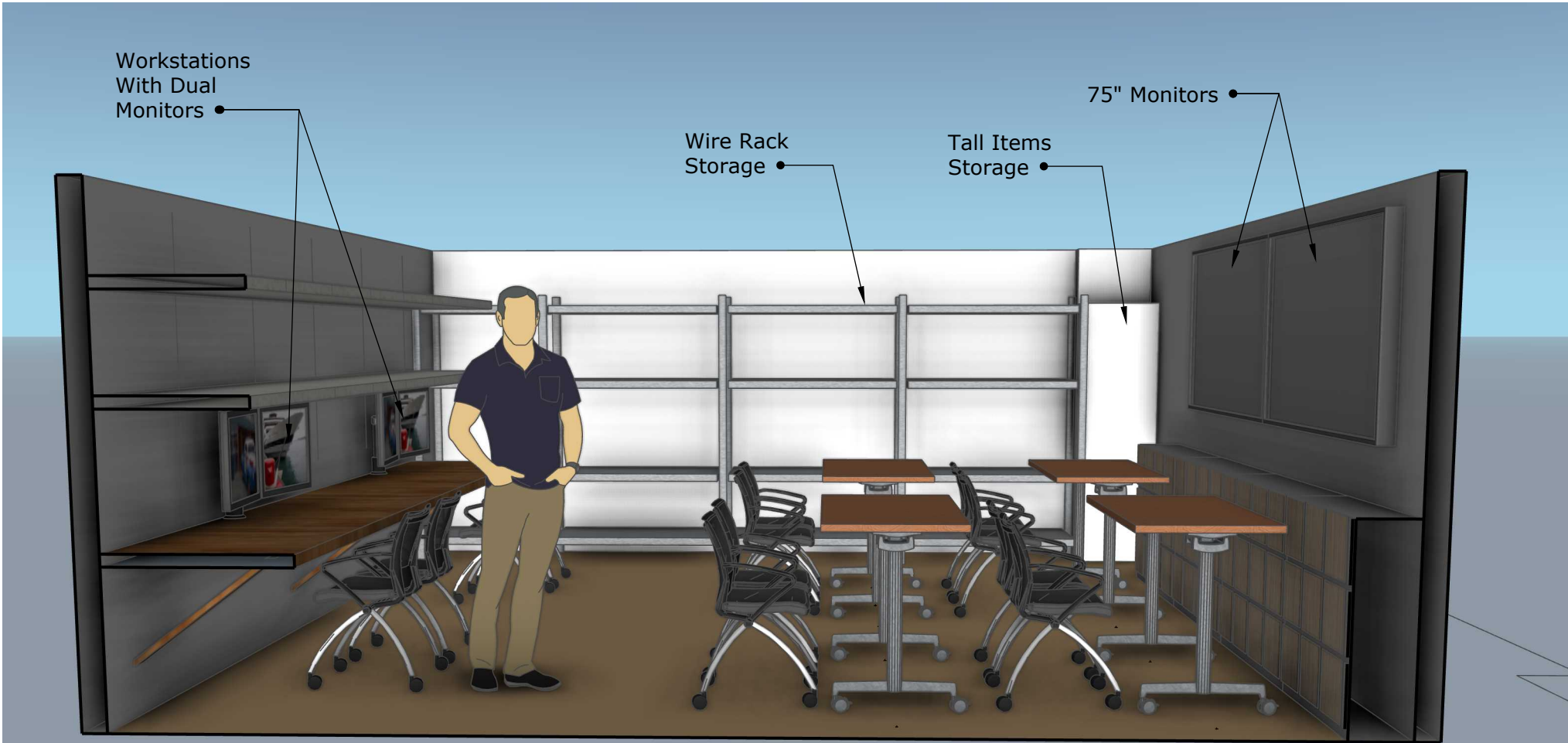# North Elevation

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Wire Storage
Shelves

75" Monitors

Kidwind
Storage
On Top

Nesting Tables
& Chairs

Bookshelves,
Wire Spool
Racks Above

South Elevation

South Elevation

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Workstations
With Dual
Monitors

75" Monitors

Wire Rack
Storage

Tall Items
Storage

East Elevation

East Elevation

75" Monitors

Grey Drawer Bins

Member Storage,
Kidwind Storage
On Top

Peg Board

West Elevation

West Elevation
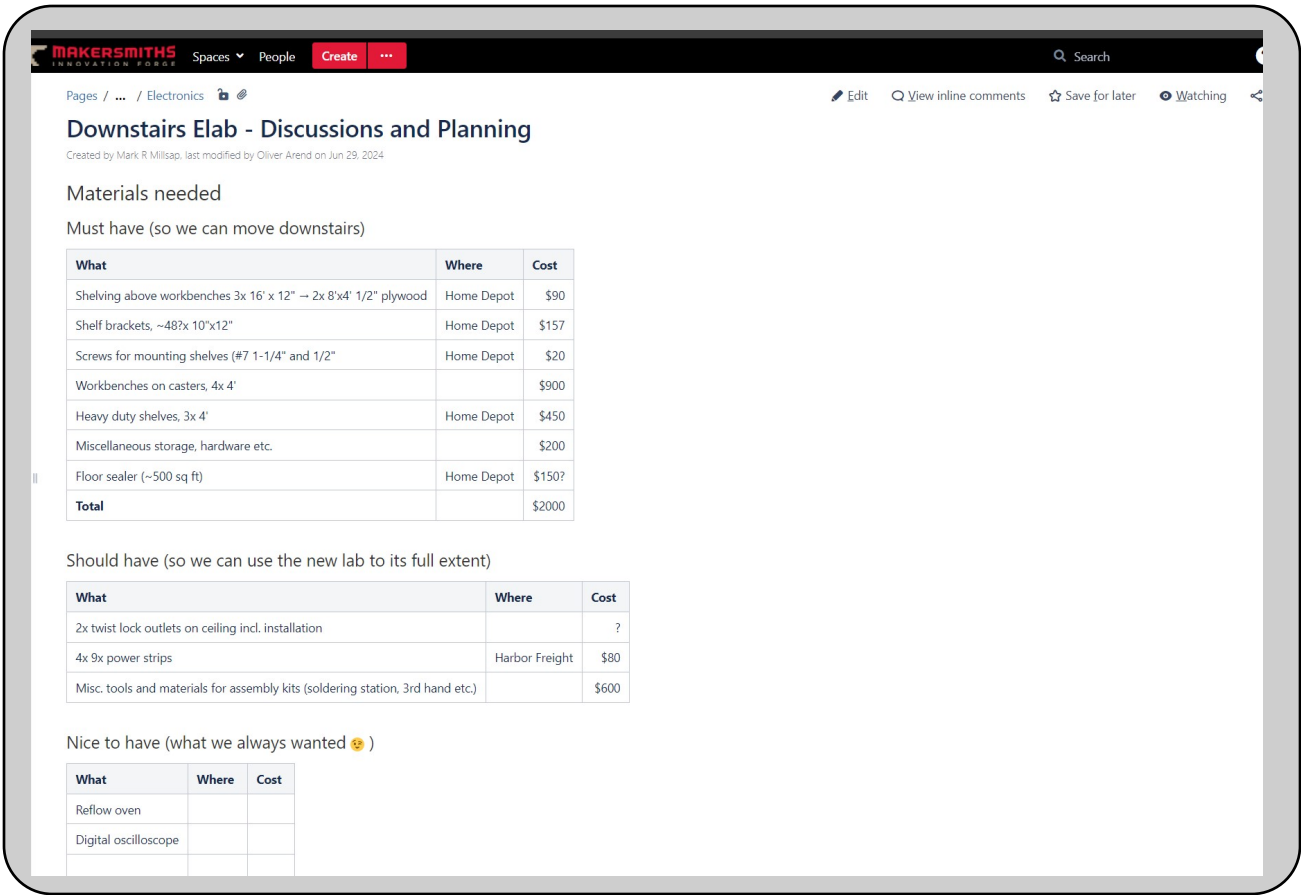
Next Steps

- Reflected Ceiling Plan

- Electrical Outlets Plan

- Pricing

- Timeline

- Approval and Go Ahead from

  Leesburg Committee/Steward

  Board of Directors

- Refinish Floor - Remove tile and re-seal floor with epoxy

- Our goal is to be complete enough by
  mid-September to accommodate
  Classes, Events & 2024-2-025 KidWind Season.

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Pricing

Oliver has started to price out some of the individual components. See wiki page noted below.

http://wiki.makersmiths.org/display/MAK/Downstairs+Elab+-+Discussions+and+Planning

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Questions? Comments?

Please see Oliver or Mark with questions or comments, or send us a note on Slack.

Thank you!