Modern Industrial Welding School Design Guide



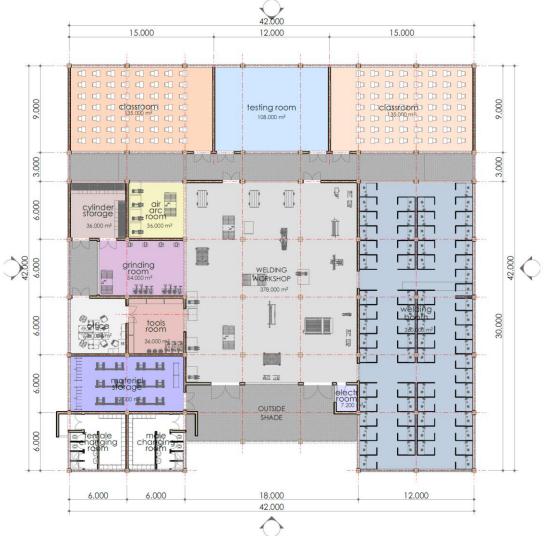
Welding School Centers of Excellence



GFP International is a proud member of the American Welding Society







Example of a 60-booth modern welding school

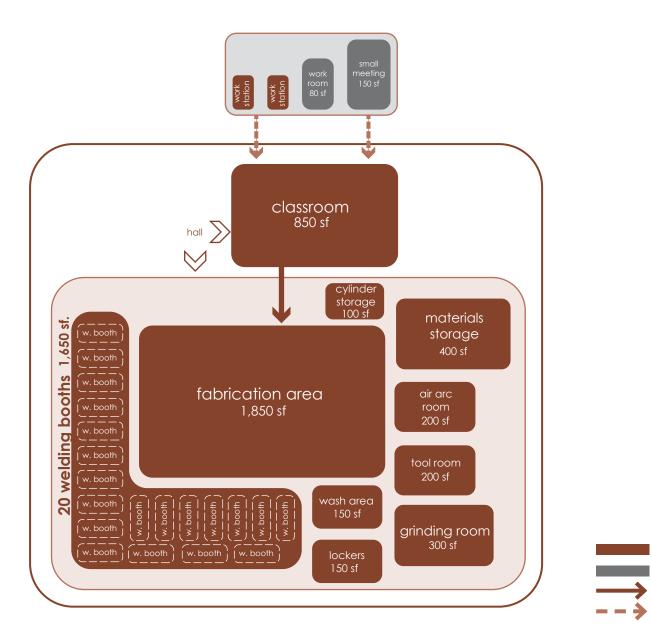
The following design guide information was provided courtesy of Jill Jones Architects, Salt Lake City, Utah, USA

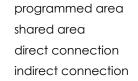
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| frades - | welding | | | | | , i |
|----------|--|------|---------|-----------|------------|-----------|
| space | space name | occ. | sf/occ. | size (sf) | quantity | total nsf |
| | | | | | | |
| a. | classrooms | | | | | |
| a.1 | welding | 25 | 34 | 850 | 1 | 850 |
| | | | | | | |
| b. | labs and support storage | | | | | |
| b.1.1 | welding lab - welding booths | | | 1,650 | 1 | 1,650 |
| b.1.2 | welding lab - fabrication area | | | 1,850 | 1 | 1,850 |
| b.1.3 | welding lab - grinding room | | | 300 | 1 | 300 |
| b.1.4 | welding lab - air arc room | | | 200 | 1 | 200 |
| b.1.5 | welding lab - locker and changing | | | 150 | 1 | 150 |
| b.1.6 | welding lab -wash area | | | 150 | 1 | 150 |
| b.1.7 | welding lab - tool room | | | 200 | 1 | 200 |
| b.1.8 | welding lab - materials storage | | | 400 | 1 | 400 |
| b.1.9 | welding lab - cylinder storage | | | 100 | 1 | 100 |
| | | | | | | |
| с. | offices-workstations-touchdowns-office support | | | | | |
| c.1 | welding | 1 | 36 | 36 | 2 | 72 |
| | | | | | | |
| | · | | | departm | ent total: | 5,922 sf |







a. classroom

a.1 welding classroom

| space summary | | mechanical | summer |
|------------------|--|-----------------|------------------|
| purpose | flat floored classroom with flexible seating | temperature | 75°f |
| function | lecture/instruction | setpoint adjust | yes |
| occupancy | 25 people | range, idle | +/- 4 |
| access | staff and students | setback | 85°f |
| | | dewpoint | 55°f |
| adjacency | | ventilation, rp | 10 cfm/person |
| relationships | fabrication area | ventilation, ra | 0.12 cfm/sf |
| connection | direct connection to fabrication area | pressurization | postive |
| | | exhaust | n/a |
| environment | | plumbing | n/a |
| walls | painted gypsum board | fire protection | yes - per nfpa |
| floor | carpet with rubber base | | |
| ceiling type | lay-in acoustic tile | electrical | |
| ceiling height | 10' min. aff | power | power @ studer |
| windows | storefront glazing | | teacher station, |
| doors | storefront door with vision glazing | phone/data | hard wired to al |
| acoustical/sound | stc 50 / nc 30-35 | audio/video | projector and so |
| other | | security | general building |
| | | | |

furniture + equipment

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flexible desks and (24) chairs laptop cart white boards

lighting lighting level lighting control

40 fc dual-tech vacancy sensors, manual on/off with dimming and presets for scene control

fixture type

ents stations, quad @ on, duplexes @ 10 ft o.c. al stations + wireless I screen with speakers general building security

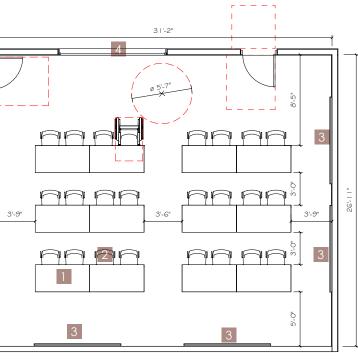
winter

72°f

yes +/- 4 60°f

38°f

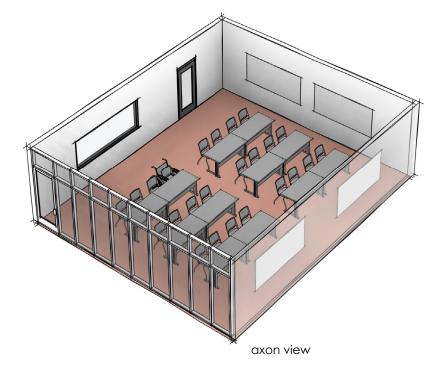
led, indirect or direct



plan view

furniture/equipment

- 1 mobile desks
- 2 stacking chairs
- 3 dry erase board
- 4 connection to lab



a.1 welding classroom (850 sf)

b. labs and support storage

b.1.1 welding lab - welding booths

space summary

purpose function

occupancy

access staff and

adjacency

relationships connection

environment

walls floor ceiling type ceiling height windows doors

acoustical/sound other

> furniture + equipment

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| training and teaching room practical experience training with hands-on learning equipment staff and students | |
|---|--|
| fabrication area arranged around fabrication area | |
| painted gypsum board stained concrete flooring with resilient base exposed duct-work 20' min. aff storefront glazing metal stc 55 -60/ nc 50-55 | |
| (20) welding booths (1) booth to be ada height | |

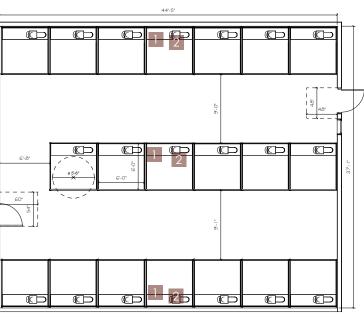
| mechanical | summer | winter | |
|------------------|--|-----------------------------------|--|
| temperature | 75°f | 72°f | |
| setpoint adjust | yes | yes | |
| range, idle | +/- 4 | +/- 4 | |
| setback | 85°f | 60°f | |
| dewpoint | 55°f | 38°f | |
| ventilation, rp | 10 cfm/person | | |
| ventilation, ra | 0.18 cfm/sf | | |
| pressurization | negative | | |
| exhaust | 0.5 cfm/sf general exhaust, plus welding booth filtration exhaust system | | |
| plumbing | oxygen, argon, acetylene piped from cylinder storage to welding booths, general shop compressed air and water | | |
| fire protection | yes - per nfpa | | |
| electrical | | | |
| power | power to equipr on non-equipme | ment, duplex outlets ent walls | |
| phone/data | hardwired and v | wireless | |
| audio/video | none | | |
| security | general building | security | |
| lighting | 40.50 % | | |
| lighting level | 40-50 fc | a al a ff diama conta a chi | |
| lighting control | ntrol manual on, timed off through relay | | |

fixture type

40-50 fc manual on, timed off through relay, with dimming led, high-bay, task-lighting at welding booths

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plan view

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axon view

b.1.1 welding labs — welding booths (1,650 sf)

furniture/equipment

1 welding surface

2 fume extractor

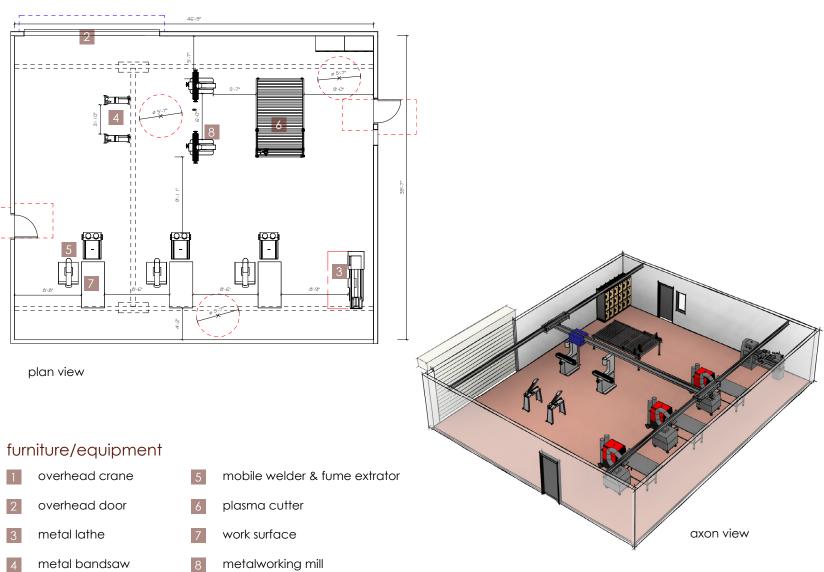
b. labs and support storage

b.1.2 welding lab - fabrication area

| space summary | | mechanical | summer | winter |
|------------------|---|------------------|-------------------|--------------------------|
| purpose | training and teaching room | temperature | 75°f | 72°f |
| function | practical experience training with hands-on | setpoint adjust | yes | yes |
| | learning equipment | range, idle | +/- 4 | +/- 4 |
| occupancy | | setback | 85°f | 60°f |
| access | staff and students | dewpoint | 55°f | 38°f |
| | | ventilation, rp | 10 cfm/person | |
| adjacency | | ventilation, ra | 0.18 cfm/sf | |
| relationships | classroom, welding booths | pressurization | negative | |
| connection | direct connection to classroom | exhaust | 0.5 cfm/sf gene | eral exhaust, plus local |
| | | | source capture e | xhaust |
| environment | | plumbing | compressed air | and water drops |
| walls | painted gypsum board | fire protection | yes - per nfpa | |
| floor | stained concrete flooring with resilient base | | | |
| ceiling type | exposed duct-work | electrical | | |
| ceiling height | 20' min. aff | power | power to suppo | rt lab equipment, |
| windows | n/a | | duplex outlets @ | 10 ft o.c. |
| doors | metal | phone/data | hardwired and | wireless |
| acoustical/sound | stc 55 -60/ nc 50-55 | audio/video | none | |
| other | | security | general building | g security |
| | | | | - · · |
| furniture + | overhead crane | lighting | | |
| equipment | large overhead door | lighting level | 40-50 fc | |
| | various welding tools for fabrication | lighting control | | ned off through relay, |
| Ţ | | | with dimming | ied on moogh relay, |
| | | fixture type | led, high-bay, to | ask-lighting at welding |
| ajc architects | | | booths | |
| H-A | | | | |

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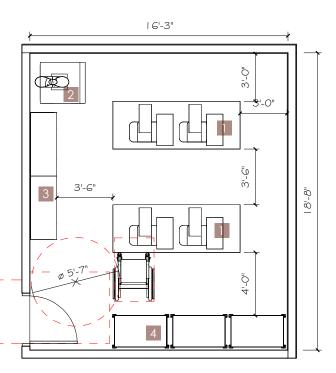
b.1.2 welding labs — fabrication area (1,850 sf)

b. labs and support storage

b.1.3 welding lab - grinding room

| space summary | | mechanical | summer | winter |
|------------------|---|------------------|------------------|--------------------------|
| purpose | training and teaching room | temperature | 75°f | 72°f |
| function | practical experience training with hands-on | setpoint adjust | yes | yes |
| | learning equipment | range, idle | +/- 4 | +/- 4 |
| occupancy | | setback | 85°f | 60°f |
| access | staff and students | dewpoint | 55°f | 38°f |
| | | ventilation, rp | 10 cfm/person | |
| adjacency | | ventilation, ra | 0.18 cfm/sf | |
| relationships | fabrication area | pressurization | negative | |
| connection | direct connection to fabrication area | exhaust | 0.5 cfm/sf gen | eral exhaust, plus local |
| | | | source capture e | exhaust |
| environment | | plumbing | compressed ai | r and water drops |
| walls | painted gypsum board | fire protection | yes - per nfpa | |
| floor | stained concrete floor with resilient base | | | |
| ceiling type | exposed duct-work | electrical | | |
| ceiling height | 12' min. aff | power | power to supp | ort lab equipment, |
| windows | n/a | | duplex outlets | @ 10 ft o.c. |
| doors | metal | phone/data | hardwired and | wireless |
| acoustical/sound | stc 55 -60/ nc 50-55 | audio/video | none | |
| other | | security | general buildir | ig security |
| | | | | |
| furniture + | (2) long work tables | lighting | | |
| equipment | grinders | lighting level | 40-50 fc | |
| | tool chests and shelving | lighting control | | ancy sensors, manual |
| ł | | 0 0 1 1 | on/off with dim | , |
| | | fixture type | led, high-bay, | task-lighting at welding |
| • | 1 | | booths | |
| ajc architects | | | - | |
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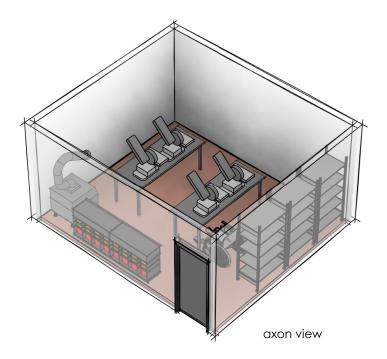


plan view

furniture/equipment

1 table top belt grinders

- 2 fume extrctor
- 3 tool chest
- 4 shelving/storage



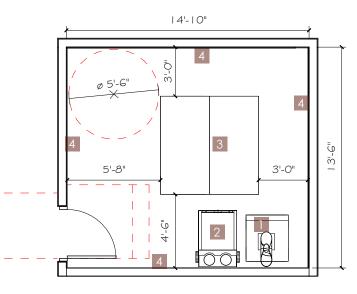
b.1.3 welding labs — grinding room (300 sf)

b. labs and support storage

b.1.4 welding lab - air arc room

| space summary | | mechanical | summer | winter |
|------------------|---|------------------|------------------|--------------------------|
| purpose | training and teaching room | temperature | 75°f | 72°f |
| function | practical experience training with hands-on | setpoint adjust | yes | yes |
| | learning equipment | range, idle | +/- 4 | +/- 4 |
| occupancy | | setback | 85°f | 60°f |
| access | staff and students | dewpoint | 55°f | 38°f |
| | | ventilation, rp | 10 cfm/person | |
| adjacency | | ventilation, ra | 0.18 cfm/sf | |
| relationships | fabrication area | pressurization | negative | |
| connection | direct connection to fabrication area | exhaust | 0.5 cfm/sf gene | eral exhaust, plus local |
| | | | source capture e | exhaust |
| environment | | plumbing | compressed air | r and water drops |
| walls | plywood | fire protection | yes - per nfpa | |
| floor | stained concrete floor with resilient base | | | |
| ceiling type | exposed duct-work | electrical | | |
| ceiling height | 10' min. aff | power | power to suppo | ort lab equipment, |
| windows | n/a | | duplex outlets @ | @ 10 ft o.c. along walls |
| doors | metal | phone/data | hardwired and | wireless |
| acoustical/sound | stc 55 -60/ nc 50-55 | audio/video | none | |
| other | | security | general building | g security |
| | | | | |
| furniture + | (2) work tables | lighting | | |
| equipment | various welding tools | lighting level | 40-50 fc | |
| | | lighting control | | ancy sensors, manual |
| 1 | | 0 0 | on/off with dim | |
| | | fixture type | led, direct | |
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furniture/equipment1fume extractor2air arc welder3work table4plywood sheathing wall cover



plan view

axon view

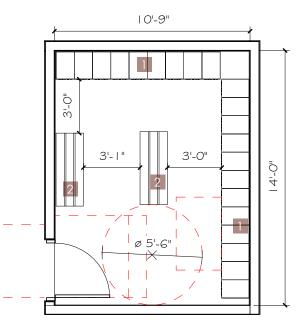
b.1.4 welding labs — air arc room (200 sf)

b. labs and support storage

b.1.5 welding lab - locker and changing

| space summary | | mechanical | summer | winter |
|------------------|---------------------------------------|------------------|------------------|---------------|
| purpose | locker room | temperature | 75°f | 72°f |
| function | area for students to change and store | setpoint adjust | no | no |
| | personal belongings | range, idle | +/- 4 | +/- 4 |
| occupancy | | setback | 85°f | 60°f |
| access | staff and students | dewpoint | 55°f | 38°f |
| | | ventilation, rp | n/a cfm/perso | n |
| adjacency | | ventilation, ra | n/a cfm/sf | |
| relationships | fabrication area, classroom | pressurization | negative | |
| connection | direct connection to fabrication area | exhaust | 0.25 cfm/sf gene | ral exhaust |
| | | plumbing | n/a | |
| environment | | fire protection | yes - per nfpa | |
| walls | painted gypsum board | | | |
| floor | stained concrete with cove base | electrical | | |
| ceiling type | lay-in acoustic tile | power | duplex outlets | @ 10 ft o.c. |
| ceiling height | 10' min. aff | phone/data | hardwired and | wireless |
| windows | n/a | audio/video | none | |
| doors | metal | security | general buildir | g security |
| acoustical/sound | stc 50/ nc 35-40 | | | |
| other | | lighting | | |
| | | lighting level | 30 fc | |
| furniture + | lockers | lighting control | dual-tech vad | cancy sensor. |
| equipment | benches | | on/off | |
| _ | | fixture type | led, direct | |
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nsor, manual

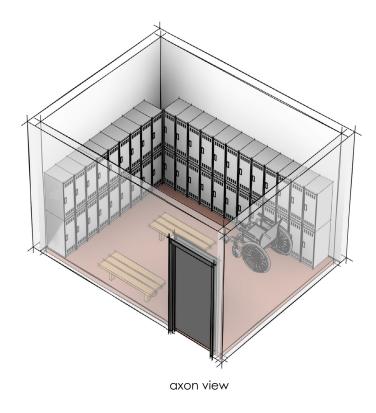


plan view

furniture/equipment

1 metal lockers

2 changing bench



b.1.5 welding lab - locker and changing (150 sf)

b. labs and support storage

b.1.6 welding lab - wash area

wash area

space summary

| purpose |
|-----------|
| function |
| occupancy |
| access |

adjacency

relationships connection

environment

walls floor ceiling type ceiling height windows doors acoustical/sound other

furniture + equipment

| area for students to wash hands and tools |
|---|
| |
| staff and students |
| lockers and changing, fabrication area |
| direct connection to lockers and changing |
| |
| painted gypsum board and tile |
| stained concrete with cove base |
| lay-in acoustic tile |
| 10' min. aff |
| n/a |
| metal |
| stc 50/ nc 35-40 |
| |
| (3) hand wash utility sinks (1) to be ada |

(3) hand wash utility sinks (1) to be ada (1) 3 compartment utility sink (1) floor sink

| mechanical | summer | winter |
|-----------------|--------------------|------------|
| temperature | 75°f | 72°f |
| setpoint adjust | no | no |
| range, idle | +/- 4 | +/- 4 |
| setback | 85°f | 60°f |
| dewpoint | 55°f | 38°f |
| ventilation, rp | n/a cfm/person | |
| ventilation, ra | n/a cfm/sf | |
| pressurization | negative | |
| exhaust | 0.25 cfm/sf genero | al exhaust |
| plumbing | scrub sinks and f | 100r sink |
| fire protection | yes - per nfpa | |
| | | |

electrical

phone/data audio/video security

lighting

power

lighting level lighting control

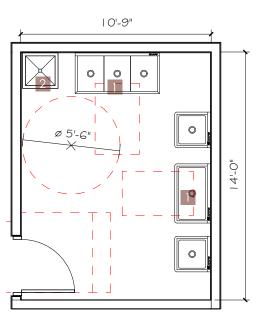
fixture type

gfci duplex outlets @ 10 ft o.c. along walls wireless none general building security

30 fc dual-tech vacancy sensor, manual on/off led, direct

1 sink

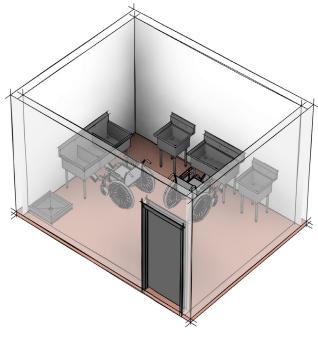
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plan view

furniture/equipment

2 mop sink



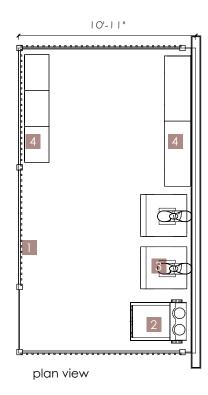
axon view

b.1.6 welding lab - wash area (150 sf)

b. labs and support storage

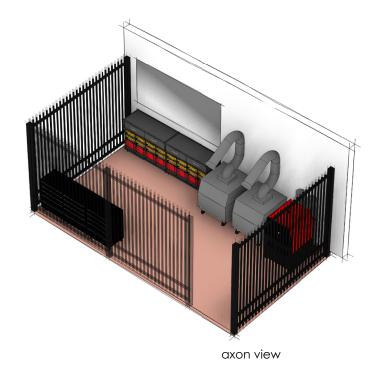
b.1.7 welding lab - tool room

| space summary | | mechanical | summer | winter |
|------------------|---|------------------|--|---------------------|
| purpose | storage | temperature | 75°f | 72°f |
| function | open cage storage for students tools | setpoint adjust | no | no |
| occupancy | | range, idle | +/- 4 | +/- 4 |
| access | staff and students | setback | 85°f | 60°f |
| | | dewpoint | 55°f | 38°f |
| adjacency | | ventilation, rp | n/a cfm/person | I |
| relationships | fabrication area | ventilation, ra | 0.18 cfm/sf | |
| connection | direct connection to fabrication area | pressurization | negative | |
| | | exhaust | 0.5 cfm/sf genera | l exhaust |
| environment | | plumbing | n/a | |
| walls | caged | fire protection | yes - per nfpa | |
| floor | stained concrete flooring with resilient base | | | |
| ceiling type | exposed | electrical | | |
| ceiling height | 10' min. aff | power | none | |
| windows | n/a | phone/data | wireless | |
| doors | caged/metal | audio/video | none | |
| acoustical/sound | stc n/a | security | general building security, locked gate | |
| other | | | | |
| | | lighting | | |
| furniture + | toolboxes | lighting level | 30 fc | |
| equipment | extra welding equipment | lighting control | pir vacancy ser | nsor, manual on/off |
| | | fixture type | led, direct | |
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furniture/equipment

- 1 open cage
- 2 mobile welder
- 3 mobile fume extractor
- 4 tool storage unit

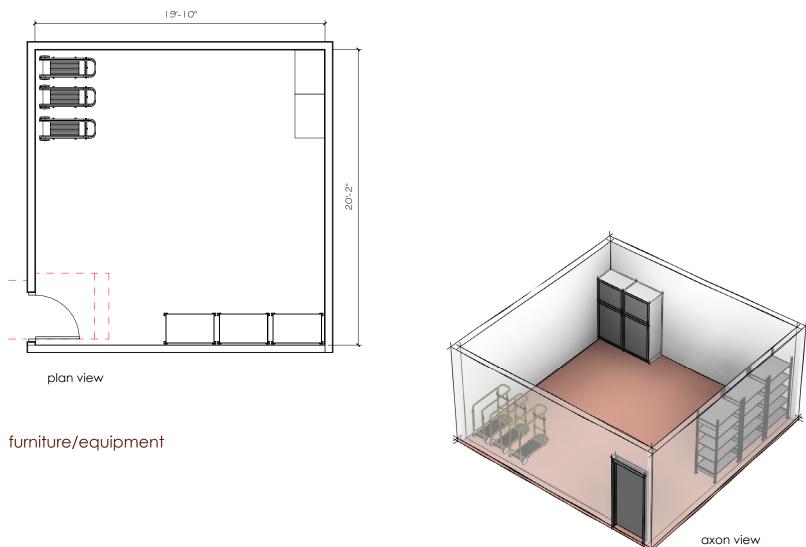


b.1.7 welding lab - tool room (200 sf)

b. labs and support storage

b.1.8 welding lab - materials storage

| space summary | | mechanical | summer | winter |
|------------------|--|------------------|-----------------------------|---------------------|
| purpose | storage | temperature | 75°f | 72°f |
| function | space to store welding materials | setpoint adjust | no | no |
| occupancy | | range, idle | +/- 4 | +/- 4 |
| access | staff and students | setback | 85°f | 60°f |
| | | dewpoint | 55°f | 38°f |
| adjacency | | ventilation, rp | 0.18cfm/person | |
| relationships | fabrication area | ventilation, ra | n/a cfm/sf | |
| connection | direct connection to fabrication area | pressurization | negative | |
| | | exhaust | 0.5 cfm/sf genera | l exhaust |
| environment | | plumbing | n/a | |
| walls | painted gypsum board | fire protection | yes - per nfpa | |
| floor | stained concrete floor with resilient base | | | |
| ceiling type | exposed | electrical | | |
| ceiling height | 10' min. aff | power | duplex outlets @ 12 ft o.c. | |
| windows | n/a | phone/data | wireless | |
| doors | metal | audio/video | none | |
| acoustical/sound | stc 50/ nc 35-40 | security | general building security | |
| other | | , | | , , , |
| | | lighting | | |
| furniture + | open shelving | lighting level | 30 fc | |
| equipment | cabinets | lighting control | | ancy sensor, manual |
| | carts to transport materials | lighting control | on/off | ancy sensor, mandar |
| | | fixture type | led, direct | |
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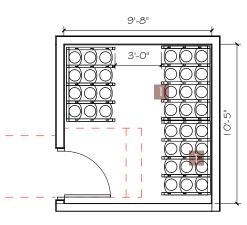


b.1.8 welding lab - materials storage (400 sf)

b. labs and support storage

b.1.9 welding lab - cylinder storage

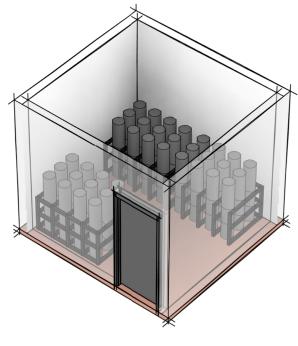
| space summary | | mechanical | summer | winter | |
|------------------|--|------------------|-----------------------------|----------------------|--|
| purpose | storage | temperature | 75°f | 72°f | |
| function | space to store cylinders | setpoint adjust | no | no | |
| occupancy | | range, idle | +/- 4 | +/- 4 | |
| access | staff and students | setback | 85°f | 60°f | |
| | | dewpoint | 55°f | 38°f | |
| adjacency | | ventilation, rp | n/a cfm/perso | on | |
| relationships | fabrication area | ventilation, ra | 0.18 cfm/sf | | |
| connection | direct connection to fabrication area | pressurization | negative | | |
| | | exhaust | 0.5 cfm/sf gene | ral exhaust | |
| environment | | plumbing | hard piped | manifolds - welding | |
| walls | painted gypsum board | | oxygen, argor | n, acetylene | |
| floor | stained concrete floor with resilient base | fire protection | yes - per nfpa | | |
| ceiling type | exposed | | | | |
| ceiling height | 10' min. aff | electrical | | | |
| windows | n/a | power | duplex outlets @ 12 ft o.c. | | |
| doors | metal | phone/data | wireless | | |
| acoustical/sound | stc 50/ nc 35-40 | audio/video | none | | |
| other | | security | general building security | | |
| | | | | | |
| furniture + | cylinder racks | lighting | | | |
| equipment | | lighting level | 30 fc | | |
| | | lighting control | | cancy sensor, manual | |
| | | 0 0 | on/off | | |
| Ţ | | fixture type | led, direct | | |
| | | | | | |
| ajc architects | | | | | |
| H | | | | | |



plan view

furniture/equipment

1 cylinder storage rack



axon view

b.1.9 welding labs — cylinder storage (100 sf)