

Steidle Building COVID-19 Return to Research Procedures: June 24 Revisions

Emergencies: Immediately notify local emergency services by dialing 911 for serious incidents (e.g., injuries requiring professional medical attention, fires, explosions, etc.). Environmental Health and Safety (EHS) is always available for notification of incidents and/or consultation regarding laboratory safety issues. They can be contacted by dialing 814-865-6391. Their website is located at www.ehs.psu.edu.

Summary: This document describes procedures for entry, exit, use, and maintenance of Steidle building that reduce our risk of exposure to and transmission of the SARS-Cov-2 virus and the COVID-19 infection. The procedures are under continuous development by the MatSE Safety Committee under guidance from the College of Earth and Mineral Science and Penn State leadership teams. The recommendations will evolve in response to new information as it emerges.

The recommendations are intended for time periods when the Penn State is operating under conditions Red, Orange, Yellow-1, and Yellow-2. As defined in the university Covid-19 policies, all university business that can be conducted remotely should be, only activities that must be conducted in Steidle are allowed.

Recommendations are provided in 16 areas and there is an appendix listing our current status regarding preparations, communication with department members and leadership, the Code Orange transition, PPE, and a lab rapid shut-down plan.

1. Safety philosophy
2. Masks and mask use
3. Gloves, glove use, and hand hygiene
4. Steidle building and laboratory entry, exit, and navigation
5. Steidle laboratory zones and zone occupancy
6. Tracking access
7. Laboratory zones and procedures for access and use
8. PI-specific equipment cleaning and lab clutter
9. Shared equipment cleaning and lab clutter
10. Close proximity work
11. Shared offices, break and meeting spaces, eating and drinking
12. Overflow space
13. Reporting
14. ebuddy system
15. Training, safety policies, and enforcement
16. Covid messaging

Appendix

17. State of MatSE Preparations
18. Code orange transition
19. Code yellow transition
20. State of PPE
21. Scram-down plans

This document was prepared by the PSU MatSE Safety Committee: Scott Henninger, Elizabeth Kupp, Jon-Paul Maria, and Shana Wagner.

This document applies to all individuals that use Steidle Labs, irrespective of your home department. If you are in MatSE, but work in another building, you will need to follow the guidelines and access plans for that building as each will have a unique structure.

1 Safety Philosophy:

- You have been home for > 60 days and you have been careful, your home is virus free;
- Steidle was thoroughly cleaned in condition orange, it's virus free;
- By returning to work we are connecting these worlds and only we can keep both safe;
- 100+ people will use Steidle and by connecting these worlds, we link the safety and health of ~100 Steidle users AND an additional 100+ families/roommates.
- **This is a heavy responsibility that we all must accept. Any risk that we take in our personal and work lives are adopted by every other Steidle occupant AND their families.**
- **And, if Centre County infection rates rise above 5.5/day, we will shut down again!**

If you feel sick or exhibit any symptoms consistent with Covid-19 stay home and self-isolate for 14 days after symptoms no longer persist. The most common symptoms as defined by the CDC include:

- Cough
- Shortness of breath or difficulty breathing
- Fever
- Chills
- Muscle pain
- Sore throat
- New loss of taste or smell

We recommend using the CDC self-checker app to make decisions regarding your condition and the information available on their website regarding guidelines for seeking health care. Both can be found at the following URL: <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>

If you come into contact with a person that is infected or who was in contact with an infected person, stay home and self-isolate for 14 days (without symptoms) before returning to campus.

Any individual that is not comfortable performing research in codes red, orange, or yellow is not required to do so. The department and your advisor will work with you on alternative paths forward.

2 Masks and Mask Use

- All persons entering Steidle should be wearing masks prior to entry.
- Masks need to be worn at all times in laboratories, hallways, or any rooms with more than one person.
- Persons sitting in an office with door shut and no other occupants can remove their masks.
- All persons exiting Steidle should be wearing masks.
- For laboratory work, we **strongly recommend** a level-1 surgical/procedural mask.
- For short trips to Steidle, *i.e.*, pick up something from an office, an improvised mask consistent with CDC guidelines can be used if surgical/procedural masks are not available. CDC guides on improvised masks can be found here: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html>
- CDC recommends that surgical masks not be used for than 8 hours continuously.
- WHO has useful resources on donning and doffing masks: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks>
- For individuals with compromised respiratory systems due to conditions such as asthma or COPD, masks may make breathing more difficult for extended periods of time. This should be taken into consideration, if present, when deciding the duration of wearing masks.

If you experience difficulty acquiring masks, please contact the MatSE Safety Committee. The MatSE department can supply masks to building occupants during our initial return to the lab and assist individual groups at acquiring a sustainable supply.

3 Gloves, Glove Use, Hand Hygiene

Gloves are effective PPE for avoiding skin contact with hazardous chemicals and from contaminating objects with dirty hands. Their role in controlling viral spread is very different.

An infected person can contaminate their hands by touching their face, sneezing or coughing into hands, using the lavatory, or rubbing their eyes. Touching any object (*i.e.*, a push bar on a lab door) can transfer the virus rendering it also contaminated. If a second person touches that push bar, their hands become contaminated, and they can infect themselves by touching their face, or any other action that transports virus particles into their respiratory tract.

A contaminated glove is as effective as a contaminated hand at spreading SARS-CoV-2, they do not provide protection in this matter (in fact, reports suggest that SARA-CoV-2 lives longer on a glove than skin). In addition, a clean hand or a clean glove are equally effective in stopping the spread of SARS-CoV-2.

In general terms, you should not rely on gloves to protect you from Covid-19 transmission, you should rely on persistent hand hygiene through handwashing, hand sanitizer, limited contact with objects, and not touching your eyes, mouth, and nose.

Note: As is always the case, you are not allowed to exit laboratories with gloved hands. If you must carry an object out of the lab that requires gloved protection, you may hold it with one gloved hand and use the other un-gloved hand to open/close doors, *etc...*

Hand Hygiene

Washing with soap and water for 20 seconds is the preferred method for keeping your hands virus-free. You really do need all 20 seconds of soap exposure, it takes time for the surfactant to destroy the virus. For best practices see: <https://www.cdc.gov/handwashing/when-how-handwashing.html>

If hand washing is not available, use alcohol-based hand sanitizer, but keep the following in mind from the CDC: If soap and water are not readily available, you can use an alcohol-based [hand sanitizer](#) that contains at least 60% alcohol. Sanitizers can quickly reduce the number of germs on hands in many situations. However;

- Sanitizers do **not** get rid of all types of germs.
- Hand sanitizers may not be as effective when hands are visibly dirty or greasy.
- Hand sanitizers might not remove chemicals from hands like pesticides and heavy metals.
- Since you don't rinse your hands when applying hand sanitizers, that route for eliminating the virus from your skin doesn't apply.

How to use hand sanitizer

- Apply the gel product to the palm of one hand (~ 2 mL).
- Rub the gel over all the surfaces of your hands and fingers until your hands are dry. This should take around 20 seconds.

4 Steidle Building Entry, Exit, and Navigation

Entry

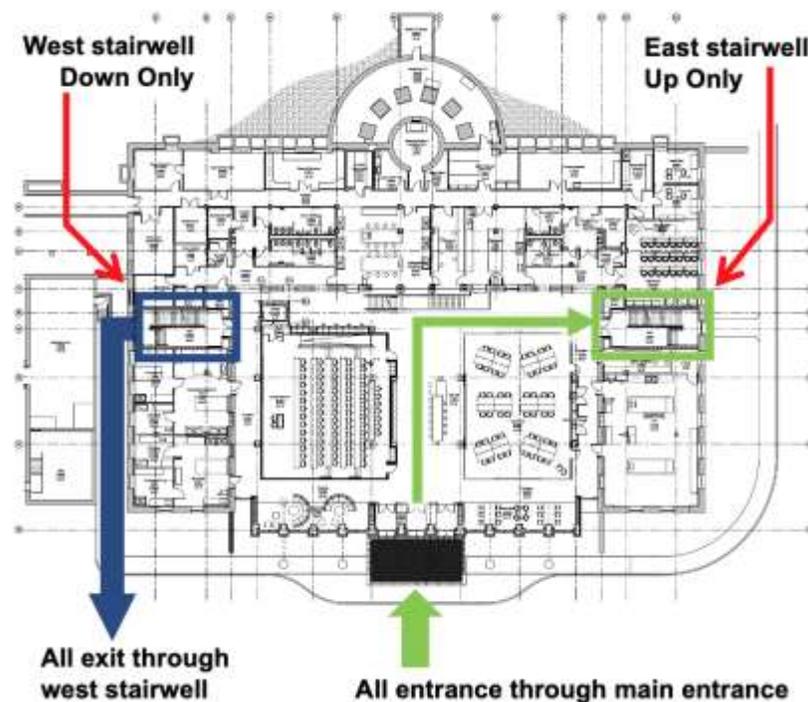
- All individuals entering Steidle will use the main entrance (opposite EE West).
- There will be a maintained hand sanitizer station and trash receptacle in the vestibule.
- Assume that on your way to Steidle, your hands became contaminated and clean them using the following SOP for building entry.
- One person in vestibule at a time, if occupied on your arrival, wait until they are clear and maintain social distancing measures outside of the building if others are waiting.

Navigation

- Once inside Steidle, follow a traffic pattern where the east stairwell is for going up and the west stairwell is for going down.
- Only use the elevator if you must. The extent of elevator cleaning is unclear. In the interim, we assume it is contaminated space. Elevator use should be reserved for ADA access and moving materials that cannot be moved safely using stairwells.

Exit

- Except in cases of emergency, exit the building (if possible based on personal abilities and needs) using the west stairwell. There will be a hand cleaning station for use as you leave. See the SOP for building exit below.



SOP: Steidle Entry

Prepare:

You should have a supply of masks from your group or the department at home.

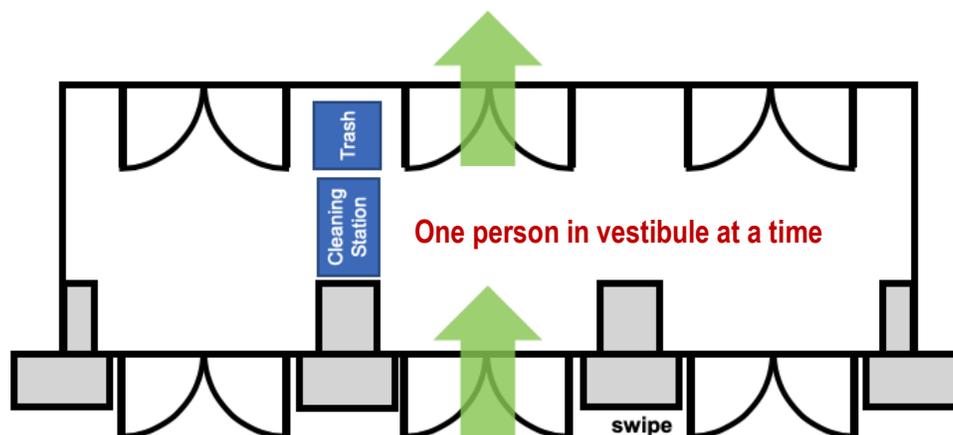
Arrive on campus with only the essential materials needed to do your lab work, have everything you need in a "hands-free" shoulder bag/backpack, *etc...* to facilitate hand sanitization.

- You should be wearing your mask in transit to Steidle and before you enter the building (right now, this is PA state law). Remember to don your mask with freshly washed hands so that it is clean. The mask that you wear (provided it is clean and fresh) on your way to Steidle is fine to use for your research shift.

Assume:

In transit to lab, your hands become infected, as is the exterior Steidle door handle and the swipe-entry device, and your ID card. If there is someone inside the vestibule, wait until they are finished before entering.

- Swipe ID to unlock the door and enter the vestibule, do not put your ID away;
- One person entering and sanitizing hands at a time, do not open the door for other people;
- Once in vestibule, clean hands and ID with sanitizer. Your hands and ID are now clean, keep your ID out. *If you put it into a pocket or wallet, you must assume it is re-contaminated;*
- Exit the vestibule with clean hands, touch nothing but the door handle. The door will be sanitized several time throughout the day;
- Proceed to your lab entrance. If your destination is one of the large shared labs, proceed to your group's designated door, one will be assigned. Except in cases of physical need, do not use the elevator. Avoid touching anything on your way to the lab to the extent possible.



SOP: Steidle Exit

Leaving Labs

- Be sure that all equipment you used be sanitized before leaving;
- Wash your hands with soap and water;
- Collect all items and exit the lab, put them in your bag, put on jacket, put bag on shoulder/back so that your hands, which are now considered contaminated, are free;
- Clean hands with sanitizer;
- Exit the lab entry corridor touching the handle with a paper towel or your clean hands, it is preferred to not lean into the crash-bar, clothing can be contaminated and transfer to the door is possible;

Leaving Steidle

- Proceed to the west stairway and exit. There will be a trashcan and cleaning station at the exit, you can clean your hands once more if needed and discard paper towels;
- At this stage, you are still wearing a mask in accordance with PSU policies, and depending on PA policies, you will likely be required to keep it on until you are home;
- NOTE: Your mask, especially the front, **is considered a contaminated object**. Remove it following CDC guidelines, handle it only using the elastic bands as far as possible away from the front. See for example: https://www.cdc.gov/vhf/ebola/hcp/ppe-training/n95respirator_coveralls/doffing_16.html

5 Steidle Lab Zones, Research Shifts, and Zone Occupancy

Establish baseline: Normal conditions: we have ~4 PIs per Steidle zone (12 total) and 94 people with swipe access. Assume 40 hour week with 70% time spent “in-lab”: **2,632 hours/week** is 100% productivity. We use this to establish an hour cap, and thus building occupancy.

Implement teaming model where two groups in one zone form a team and work simultaneously. Selection is based on maximum physical separation. The large Steidle shared labs are research zones.

Multiple rotation structures with differing levels of “conservatism” regarding protection from virus transmission are available to consider. We will consult with the college on the preferred choice. As an example, three hypothetical possibilities are shown.

Within a specific rotation process, specific implementation plans for the occupants of each zone should be prepared by the zone users. The details of zone operations are zone specific, provided they fit within college guidelines.

5.1 Lab access rotation options

Zone 2 is used for illustration: Primary Groups in Z2: Beese, Maria, Mauro, Priya.

Groups that are physically separated work simultaneously (Maria|Priya and Beese|Mauro)

2-day rotation

MTWRFSSMTWRFSSMTWRFSS
MTWRFSSMTWRFSSMTWRFSS

Maria and Priya groups 12-hr day
Beese and Mauro groups 12-hr day

3-day rotation

MTWRFSSMTWRFSSMTWRFSS
MTWRFSSMTWRFSSMTWRFSS

Maria and Priya groups 12-hr day
Beese and Mauro groups 12-hr day

6-day rotation

MTWRFSSMTWRFSS
MTWRFSSMTWRFSS

Maria and Priya groups “have the lab” all day
Beese and Mauro groups “have the lab” all day

14-day rotation

MTWRFSSMTWRFSSMTWRFSSMTWRFSS
MTWRFSSMTWRFSSMTWRFSSMTWRFSS

Maria and Priya groups
Beese and Mauro groups

- Individual groups decide on lab time distribution, provided they follow an hours/week cap
- Hour cap will reflect the **occupancy levels** announced by the College and local safety concerns
- Each group must **record hours** of each member (College mandate, solution described below)

5.4 Staged laboratory access: start conservatively and grow occupancy with feedback from those working in the labs on a weekly basis

Week #1 – this week begins once Steidle is granted Yellow status by EMS

Establish a 12 hour day: 8 am to 8 pm (*anticipate overnight restrictions from PSU*)

Each group can have 2 graduate students in their labs simultaneously on their days

On average, 4 faculty share each lab zone so each day 2 of their members active in shared labs

4 students x 12 hours x 3 zones x 6 days/week = 864 work hours

This amounts to **33%** of normal activity, and an hourly cap per group of 72

Sunday following week #1: Zoom town hall meeting to get student and faculty feedback and modify schedule as warranted with the expectation of boosting access.

We recommend a Zoom meeting each day with each research group conducted by their PI to address any concerns in week 1

Week #2 (anticipated)

Establish a 12 hour day: 8 am to 8 pm (*anticipate overnight restrictions from PSU*)

Each group can have 3 graduate students in their labs simultaneously on their days

On average, 4 faculty share each lab zone so each day 2 of their groups active in shared labs

6 students x 12 hours x three zones x 6 days/week = 1296 work hours

This amounts to **50%** of normal activity, and a hourly cap per group of 108

Sunday following week #2: Zoom town hall meeting to get student and faculty feedback and modify schedule as warranted.

Week two has roughly the occupancy level corresponding to the maximum for Yellow-1

We recommend a Zoom meeting each day with each research group conducted by their PI to address any concerns in week 2

5.5 Transition to Yellow-2 (75% occupancy expected)

We do not know how or when this will happen, but the options that we have to increase occupancy and meet with Yellow-2 occupancy include:

1. More groups working per zone simultaneously
2. Extend the workday

The safety committee proposes that each of these should be evaluated AFTER several weeks of collecting data and feedback from research activities in Yellow-1.

5.6 Modifications to Initial Shift Model While in Yellow – 1

June 24: After reviewing the last two weeks of access it seems that everything is going well. Continued reminders for our group members to keep after their “distancing” efforts are needed. Otherwise, compliance with our Steidle plan is high.

Several people are experiencing the need for more lab time, and in particular more hours of access, not more people in the labs at once. In addition, feedback that we received from our group members last week indicated that current occupancy levels were “comfortable”.

In response, as of June 24, the following boost was implemented:

Currently ½ of Steidle has 8 am-8 pm access on MTW, the other half on RFS. We will add a third shift from 8 pm – 12:00 am. That shift will be of the opposite “rotation”:

Group 1: MTW 8-8 plus RFS 8-12

Group 2: MTW 8-12 plus RFS 8-8

we would also stipulate in the SOP that:

1. Buddy system enforced – in person or e-buddy.
2. Reserve “elevated risk” activities to the normal shifts.

This way every group gets another 4 hour shift three times a week, and perhaps more importantly, each group gets some access every day to facilitate ongoing experiments that need such attention. This modification preserves our cohort separation and some barrier to minimizing spread upon exposure.

July 16: After ~ 6 weeks of research in Yellow-1, positive experiences allow us to further ramp our research. Starting July 16, we boost laboratory access to 8 persons at one time in the large Steidle shared labs. We do so by adding two shifts. To minimize local congestion, the new shifts will be given to those groups on the days that they previously did not have shifts. Groups are encouraged to trade shifts to facilitate optimized use of Steidle Labs while respecting max occupancy.

Number of shifts on each day for each of the prime groups in 218 Steidle

8 am – 8 pm	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Beese	3	3	3	1	1	1	NA
Mauro	3	3	3	1	1	1	NA
Maria	1	1	1	3	3	3	NA
Priya	1	1	1	3	3	3	NA
8 pm +	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Beese				3	3	3	NA
Mauro				3	3	3	NA
Maria	3	3	3				NA
Priya	3	3	3				NA

NA: negotiated access with Professor Sinnott

Number of shifts on each day for each of the prime groups in 318 Steidle

8 am – 8 pm	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
							NA
							NA
							NA
							NA
8 pm +	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
							NA
							NA
							NA
							NA

NA: negotiated access with Professor Sinnott

Number of shifts on each day for each of the prime groups in 418 Steidle

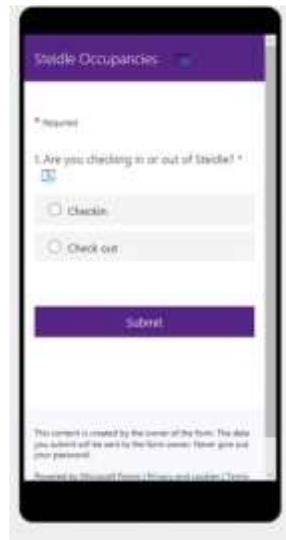
8 am – 8 pm	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
							NA
							NA
							NA
							NA
8 pm +	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
							NA
							NA
							NA
							NA

NA: negotiated access with Professor Sinnott

6 Tracking Access

By mandate from the EMS Dean's office we must document and track all Steidle access and be able to provide occupancy data to ensure that we are compliant with university color codes and to facilitate contact tracing in the event of an exposure.

To do so, we will use a Microsoft Forms survey upon each entry and exit of Steidle. QR codes will be posted on the Steidle entrance and exit points such as the one below. Imaging this code with your cell phone camera will immediately open your browser to a survey page like the one shown to the right, you will have to be logged into your Microsoft account, only those in the PSU system can access this survey.



Complete this survey every time you enter and exit the building. Doing so will populate a record of your building access. The information will only be available to the MatSE safety officer. If you do not have a smart phone, you can log into the URL from any computer with internet access and sign in. The URL is:

<https://forms.office.com/Pages/ResponsePage.aspx?id=RY30fNs9iUOpwcEVUm61LrTXTgCwy5LpOGt279u31JUQ05BSEKRS05SNEwwTEdLMki3SIRBUzRKWi4u>

Contact Tracing Impact

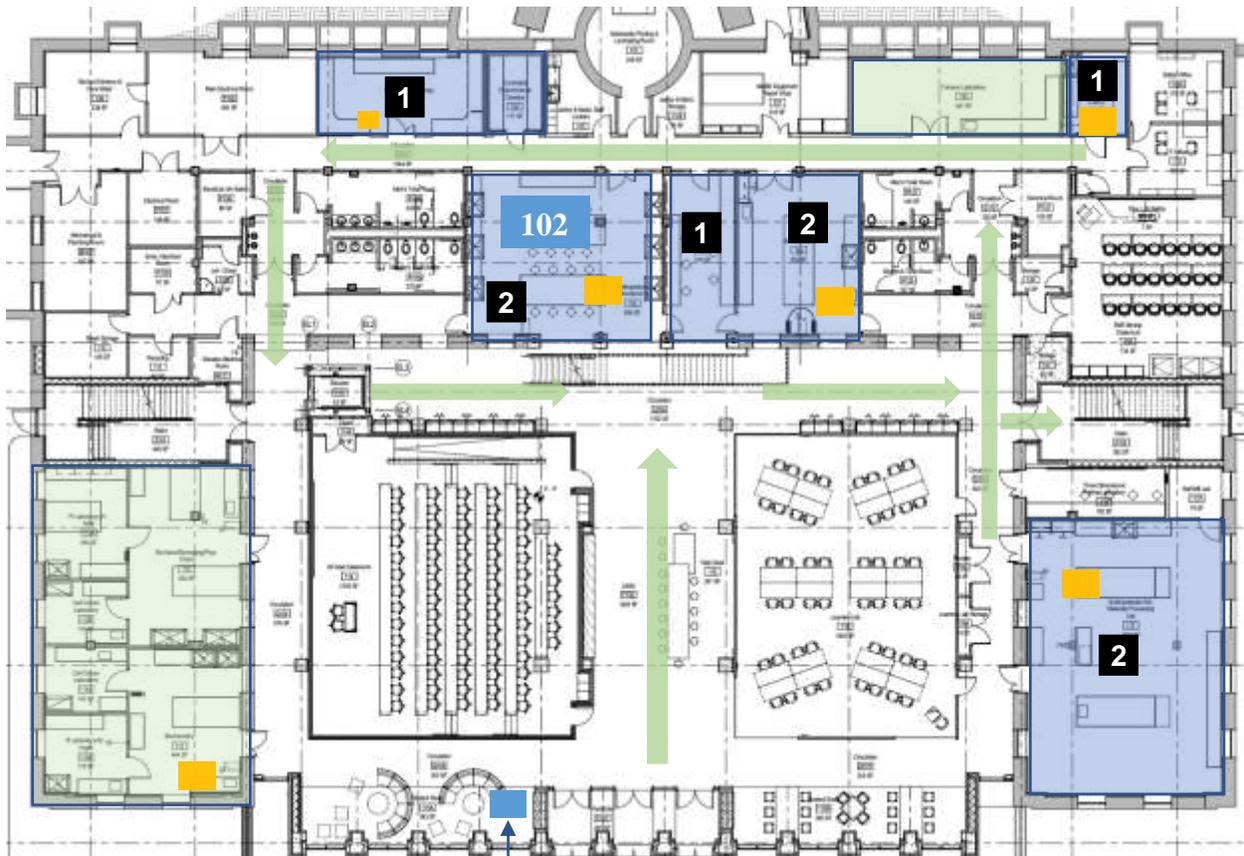
By collecting and archiving this building use data, in the case of an outbreak or an exposure, we will be able to provide public health officials with an accurate record of building occupancy immediately upon request. This is a critically important capacity to minimize/slow transmission. To ensure accuracy of our data set, on a weekly basis we will query the swipe access records to compare numbers.

Not completing the survey by any Steidle occupant is considered a safety violation

7 Laboratory Zones and Procedures for Access and Use

Steidle labs are divided into 4 zones as shown in the building schematics below. The laboratories in each zone will be equipped with hand cleaning materials in close proximity to the entrances, their locations are shown on the following maps.

First floor: Zone 1



Computer for Z1 equipment reservations

Cleaning station with a sink, soap, and IPA/water sanitizing solution



SOP: Steidle Zone 1 shared laboratory use (Labs 102, 105, 106, 117, 124, 126 and 128)

Most users of Zone 1 will probably start their shift in one of the larger labs in Z2-Z4 where they will establish home base, deposit bags and coats, and do their initial hand and fomite cleaning, and then proceed to use Z1 labs. SOP for Zone 1 use listed below.

Those who want to directly access Z1 labs will use lab 102 as a location for handwashing and cleaning, and storage of personal items while working in Z1, if and only if you go directly to these labs from the outside. Otherwise personal items should be left in the hallways outside Z2-Z4 labs.

Zone 1 navigation: Green arrows on the Z1 map show the preferred traffic flow pattern. When possible, follow them.

Scheduling Equipment: An internet accessible SharePoint calendar will be established and managed by Brady Brown in the main office to organize shared equipment use. Please email: userfacilities@matse.psu.edu to make a reservation for the instrument of interest and she will populate the calendar.

Entering Labs

- Room 102 should be used as a primary hand cleaning station and for storing personal belongings in case you are coming directly to Zone 1 from outside (*i.e.*, not storing and cleaning items in Z2-Z4 lab entry corridors. Hooks are on the south glass wall for jackets.
- Upon entering any lab in Zone 1, wash your hands with soap and water for 20 seconds. If traversing from lab to lab, you must assume that handles are contaminated, as are your hands and your ID upon entry – both need cleaning.
- Note that 105 Steidle Building does not have a sink, a sanitization station will be set up and maintained in this lab
- To enter 126 Steidle (optical microscopy), use the doors into 102 Steidle Building
- Only items needed in the laboratory should be taken into the labs and these must be sanitized upon entry. Other items should be left in the hallway or upstairs outside researchers' normal lab space, or in lab 102

Laboratory Occupancy (also noted on the map above)

- Labs 102, 105, 106, 124, and 128: one-person occupancy
- Lab 117 and 126: two-person occupancy

Leaving Labs

- Wash hands (or use hand sanitizer in 105 Steidle) prior to leaving lab and wipe door handle
- Proceed to exit or upstairs laboratory using established one-way traffic pattern

SOP: Using Lab 126 with Two Occupants

Purpose: Outlining best practices for using the lab space with an occupancy of no more than **two** people during the COVID-19 yellow phase.

Guidelines for reservation:

1. The lab space is only to be used by people if it is also their groups' day in Steidle.
2. A lab reservation must be made on the Steidle Sharepoint calendar for Steidle 126.
 - a. <https://pennstateoffice365.sharepoint.com/sites/SteidleLabSignup>
 - b. **In the description of the reservation indicate the equipment you plan on using during reserved time.**
3. If there is an existing reservation check the reservation description to determine if the work is compatible (*i.e.*, Not using the same equipment, equipment that is on the same side of the lab bench that would violate the > 6' CDC distance guidelines).

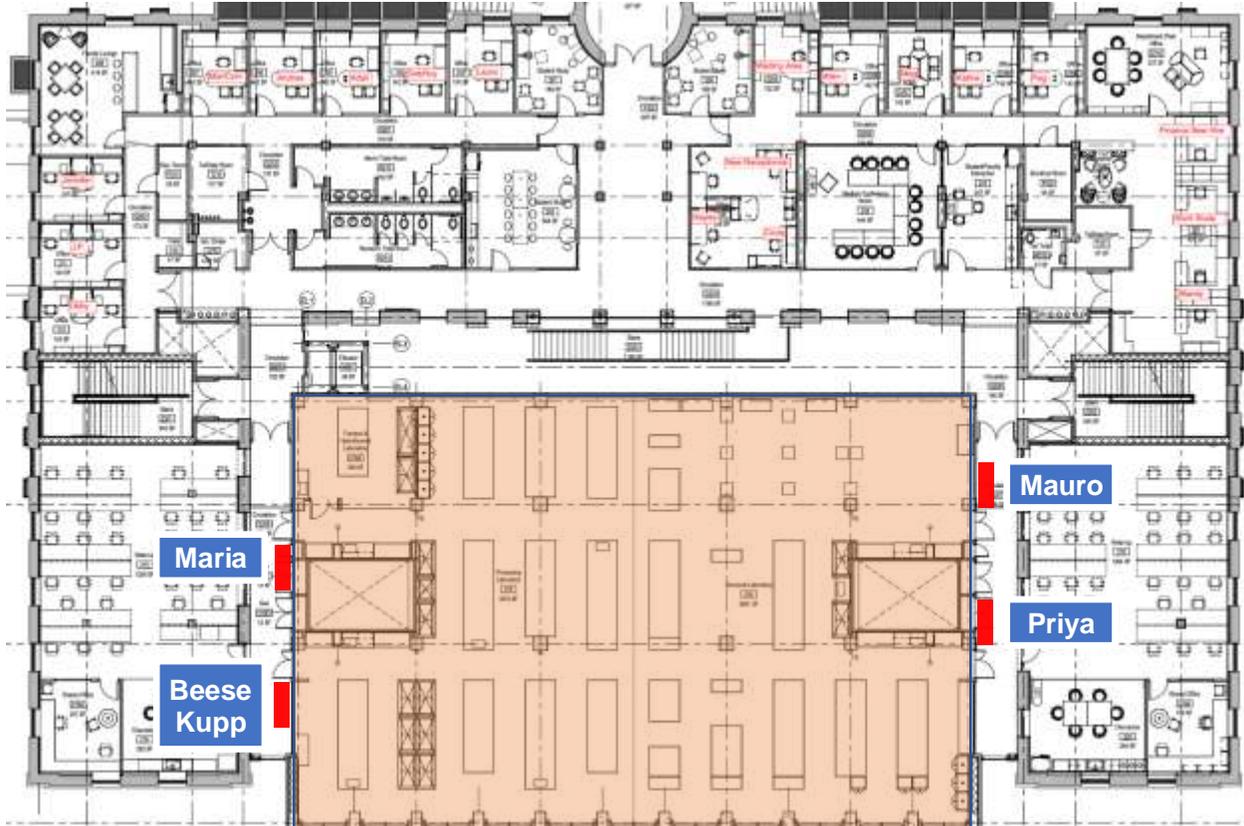
Entering and exiting

1. Room has glass walls so if occupants are present a person entering can see them and navigate appropriately to maintain 6' separation.
2. Polishing stations are not located in the entrance or exit pathway so entry and exit can be accomplished while social distancing.

While in the lab:

1. Maintain > 6' CDC distancing guidelines.
2. Use only the equipment that you made a reservation for on the sharepoint and internal reservation system.
3. Thoroughly clean the equipment and work area after you are done using it.

Second Floor: Zone 2

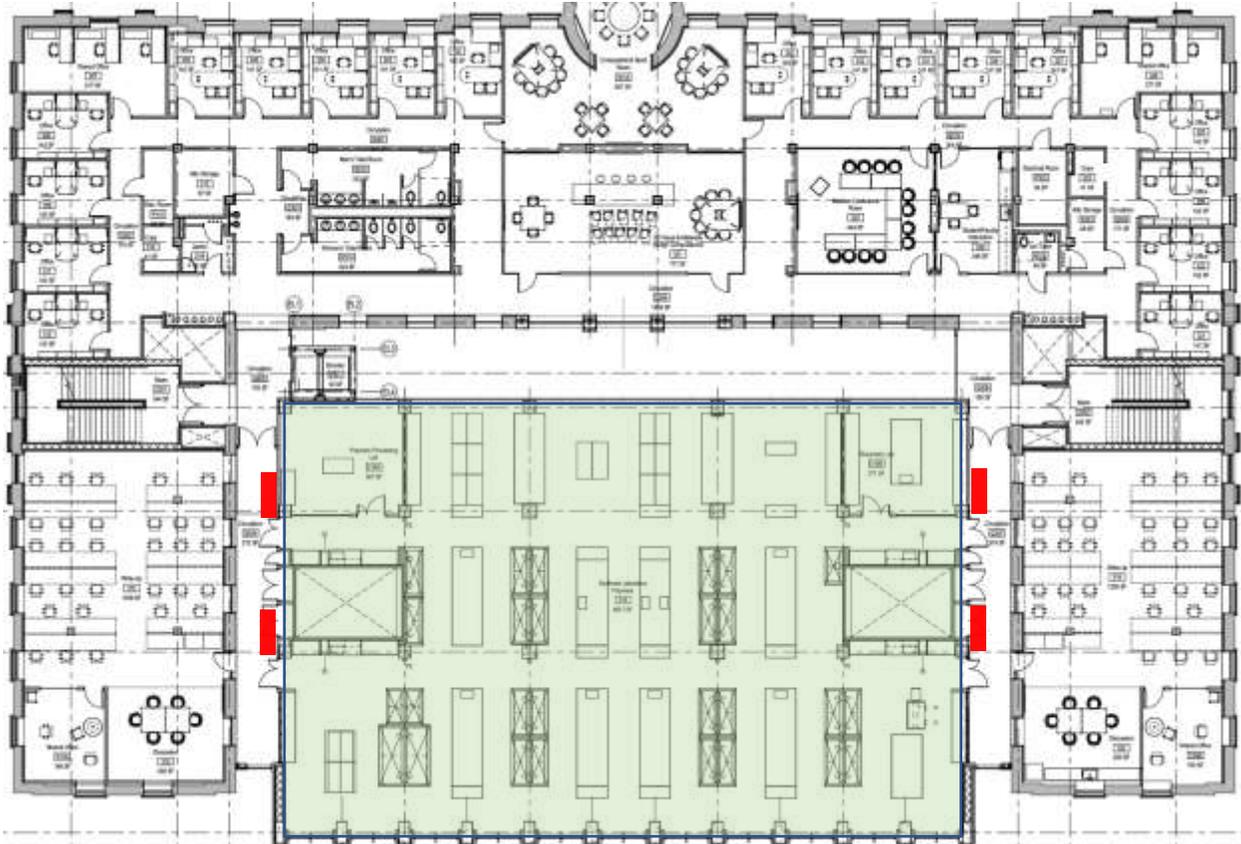


Cleaning station with towels, sanitizer, and IPA/Water mix 

Research groups in Zone 2 are assigned a specific laboratory door and should use that door for all lab ingress and egress.

Doing so will minimize “accidental” contact in tight lab entrance hallways and will minimize the ability to transmit virus between groups.

Third Floor: Zone 3

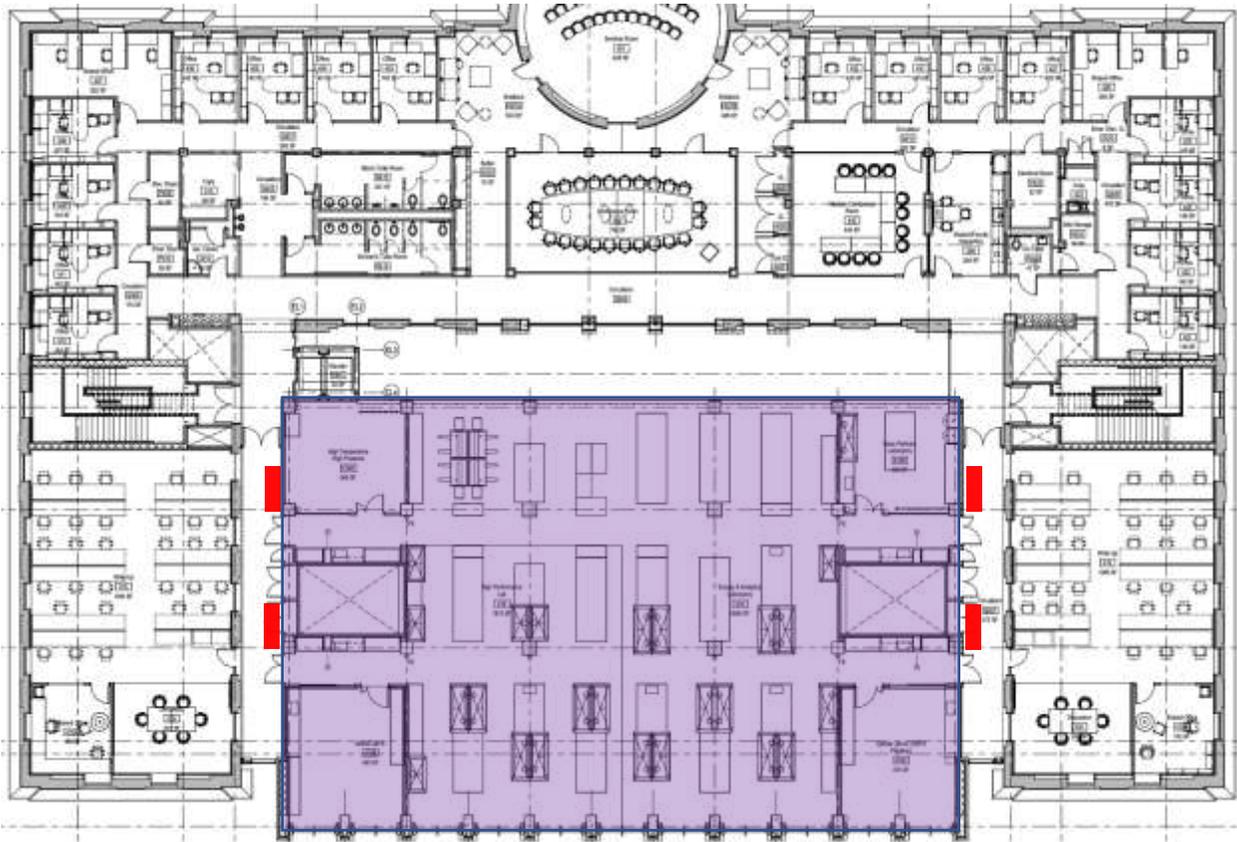


Cleaning station with towels, sanitizer, and IPA/Water mix ■

Research groups in Zone 3 are encouraged to assigned a specific laboratory door for each group and use that door for all lab ingress and egress. If group dynamics between floors makes this impossible or if it promotes excessive time walking through corridors then do not implement.

Doing so will minimize “accidental” contact in tight lab entrance hallways and will minimize the ability to transmit virus between groups.

Fourth Floor: Zone 4



Cleaning station with towels, sanitizer, and IPA/Water mix



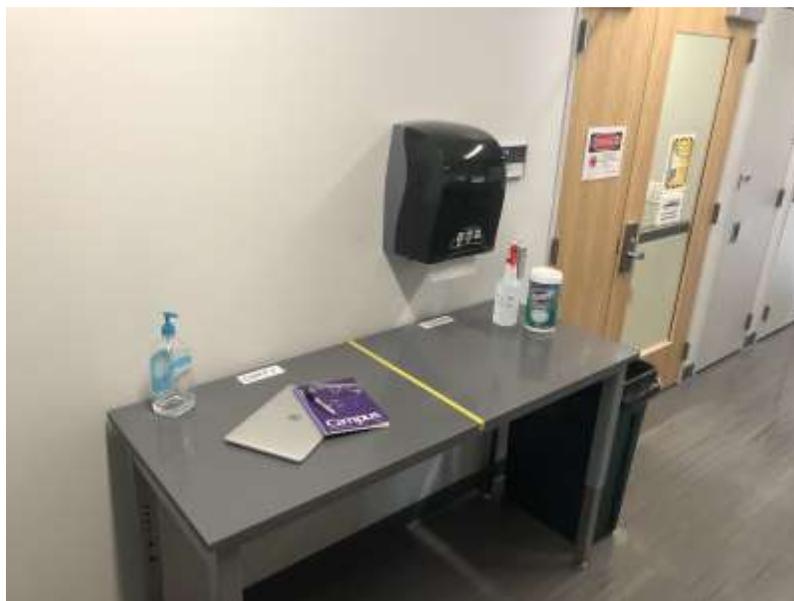
Research groups in Zone 4 are encouraged to assigned a specific laboratory door for each group and use that door for all lab ingress and egress. If group dynamics between floors makes this impossible or if it promotes excessive time walking through corridors then do not implement.

Doing so will minimize “accidental” contact in tight lab entrance hallways and will minimize the ability to transmit virus between groups.

SOP: Steidle Shared Laboratory Entry – Zones 2, 3 & 4

Note: Each group will have a designated exit/entry point. Adhering to them is a good way to minimize cross-contamination between groups in the case of an exposure. After you enter Steidle and clean your hands, go directly to that entrance

- With ID still in hand swipe into the lab access corridor;
- There are coat hooks at 6-foot intervals on the corridor walls. Hang your coat on one of the wall hooks and put your bag underneath it. As we return to Steidle all shared office spaces and conference rooms will only be accessible by individual request to the safety committee.
- There will be a cleaning station at each entrance. The staging table is divided into two halves, dirty (farther from the door) and clean (closer to the door). On the clean half, there will be cleaning supplies;
- Take all items that you wish to have in the lab (phone, pens, computer, notebook, your ID, safety glasses, *etc...*) and put them on the staging table dirty half. Phones and laptops are excellent transmission vehicles, it's very important to clean them thoroughly;
- Using dilute bleach or IPA solution and paper towels, clean all objects that you wish to take into the lab. If these objects cannot withstand being wiped with a damp cloth, they don't belong in the lab. As you clean each one, move it to the clean side;
- As you finish cleaning, wipe off your hands to be sure that any contamination from the cleaning process is removed and wipe off the lab door handle;
- Collect your items and swipe into the lab;



- As you walk in, immediately wash hands with soap and water, 20 seconds. Every lab entrance has a sink immediately adjacent to the entrance. Each one has been upfitted with a wall-mounted soap dispenser, have been cleaned, and has been decluttered. An example of entrance 218 A is shown below:



SOP: Transitioning between laboratories

While most research is done in a single lab, there are instances where researchers must transition between floors. When doing so, the following SOP should be adopted.

- Before exiting the lab, wash your hands for 20 seconds;
- As is always the case, you are not allowed to exit laboratories with gloved hands. If you must carry an object out of the lab that requires gloved protection, you may hold it with one gloved hand and use the other un-gloved hand to open/close doors, *etc...* With one hand gloved, you should still wash hands unless glove was freshly donned.
- If the object is too large to be carried with one hand, use a cart, do not push the cart with gloved hands;
- Exit the lab;
 - A. Proceed up or down the designated stairwell (east for up west for down);
 - B. Use the elevator, only one person in elevator at a time;
- If entering one of the large labs, swipe into the access corridor, sanitize your hands and ID then swipe into the lab. As soon as you enter the lab wash your hands with soap and water.
- If entering one of the shared first floor labs, swipe in and clean your hands and ID by washing with soap and water or using hand sanitizer, depending on what is available in each location.

8 PI-specific equipment cleaning and lab clutter

- **PI-specific equipment** is defined as an instrument or area that is owned, maintained, and managed by individual faculty members and are in most cases only used by one person during a shift.
- At the start of every shift when this equipment will be used, the area and the instrumentation will be disinfected using either isopropanol/water mixture or bleach solution. This includes all surfaces and tools to be used
- **At shift end** the work area will again be disinfected using either an isopropanol/water mixture or bleach solution, this includes all surfaces and tools that were used. Cleaning as you go is recommended at all times, even if your shift is not over.
- Disinfection supplies are the responsibility of the individual PIs that manage this instrumentation.
- An example is shown below of a deposition tool in the Maria group. A spray bottle of IPA/water should be maintained for each instrument or work area.

CDC guidelines can be found here: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html>

There is an enhanced need for all laboratory instruments and work areas to be organized and de-cluttered. Messy lab stations cannot be readily disinfected and will be considered occupational safety hazards and will need organization. Labs will be monitored to ensure a clutter-free environment.



9 Shared equipment cleaning and lab clutter

- **Shared equipment** is defined as an instrument or area that is owned, maintained, and managed by individual faculty members or the department and are often used by multiple people during a shift. This applies to, for example, characterization equipment in 105 Steidle, the x-ray diffractometer in 218 Steidle, and the characterization tools in 418 Steidle
- At the start of every equipment use session, the area and the instrumentation will be disinfected using either isopropanol/water mixture or bleach solution. This includes all associated surfaces and tools.
- At the end of each use, the work area will again be disinfected using either an isopropanol/water mixture or bleach solution, this includes all surfaces and tools that were used.
- Disinfection supplies are the responsibility of the individual PIs who own this equipment, or instrument managers for equipment that is department owned and managed.

CDC guidelines can be found here: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html>

There is an enhanced need for all laboratory instruments and work areas to be organized and de-cluttered. Messy lab stations cannot be readily disinfected and will be considered occupational safety hazards and will need organization. Labs will be monitored to ensure a clutter-free environment.

10 Close Proximity Work

During the course of normal laboratory work situations invariably arise when individuals need to be closer than 6'. Common examples include equipment maintenance and fabrication, instrument relocation and/or installation, and method/technique training.

To conduct these activities, the following steps are warranted:

1. Develop a plan of work that accomplishes the task with maximum distance and minimum time. Consider where you will stand, the direction that you will face, and the location of all tools and supplies needed.
2. Before you start close proximity work, don an N95 or similar respirator that provides a snug face seal. If the N95 mask has a vent valve, modify it so as to keep the vent shut.
3. Before you start close proximity work, don laboratory gloves.
4. Do your best to minimize the duration of the activity – perform only those aspects that demand less than 6' separation.
5. When completed, sterilize the work area, remove and discard gloves, and wash hands.

We recognize that N95 masks are a non-negligible expense thus we advocate reserving them for close-proximity work and reusing them until they are no longer effective.

One sensible procedure is to provide any group members who engage in close-proximity work with 5 respirators. That way they can use one during a lab session, then store it in a paper bag for four days, at which point any virus particles will no longer be viable and the mask can be safely reused. Washing, heating, chemically treating, or exposing masks to UV light is not recommended. The potential to damage the mask materials and compromise their sealing or filtering performance is substantial.

11 Shared offices, Common Spaces, Eating and Drinking

In Code Orange and Yellow conditions, on-campus activities are reserved for those that cannot be accomplished remotely. As such, Steidle access is limited to laboratory work

Recognizing the challenges of appropriate social distancing in shared offices, break rooms, and conference rooms, and also the fatigue that can occur when working in a potentially noisy lab while wearing a mask and goggles for many hours, shared offices will be accessible under these conditions, but only when the following SOP is implemented.

Preparing shared offices for use in Yellow-1

1. All items shall be removed from the offices with the exception of external monitors. This means that any item that you will use must be brought with you and taken home at the beginning and end of your shift respectively, this includes all items in the kitchenette areas; *countertops and shelves should be clean and empty*. The reason for this requirement is that (1) under these conditions, the office space can be disinfected simply by spraying the area with an alcohol/water solution with nearly no effort. We do not have staff or OPP support to keep these shared areas clean so we implement this mode of operation, and (2) if needed anyone can use any desk since they can be cleaned more easily than a shared lab space. If groups prefer, instead of removing some items, they can box and seal them, and store in the shared office spaces along the walls. Individual groups are responsible to clean and prep their offices. The safety committee is available to assist in the process.
2. After items are removed, all surfaces and chairs should be cleaned with either the Betco, 5% bleach, or 70% isopropanol solutions. The isopropanol solution are preferred for the chairs or any textile surfaces. Individual groups are responsible to coordinate and clean their areas.
3. The image below is an example of the required preparations: shared office 215 Steidle.



Using Shared offices in Yellow – 1

1. In the order of decreasing preference: if 6' social distancing allows and if you are not facing another person across the desk, use your normal desk; if you are too close to your neighbors, move your desk to an unoccupied spot that affords the needed distancing; if you cannot find one, use any spot that is vacant at the time of use and distanced appropriately from your co-occupants. Scott Henninger can assist with desk assignment issues.
2. When you first enter the office, wipe down the desk area and the chair arms with the solution of choice.
3. Wear your mask at all times in the office.
4. When you leave the office wipe down the desk area and the chair arms with the solution of choice
5. You can have water in the office. When you need a drink, quickly shift or remove your mask to accommodate. Remember not to touch the front of your mask to do so. Maneuver it by the ear loops.

In Yellow-1, office occupancy is the same as lab occupancy. 8 total occupants in both office quads at one time.

In reference to Governor Wolf's July 16th order saying that"

"Teleworking Unless not possible, all businesses are required to conduct their operations in whole or in part remotely through individual teleworking of their employees in the jurisdiction or jurisdictions in which they do business. Where telework is not possible, employees may conduct in-person business operations, provided that the businesses fully comply with all substantive aspects of: the Order of the Secretary of the Pennsylvania Department of Health Directing Building Safety Measures, issued April 5, 2020; the Order of the Secretary of the Pennsylvania Department of Health Directing Business Safety Measures (to keep employees and customers safe), issued April 15, 2020; and all existing and future applicable guidance issued by my Administration, the Department of Health and the Centers for Disease Control and Prevention."

Office space access is restricted to students during their laboratory shifts. The intent is to provide a quiet location to occupy during shift periods that involve waiting for experiments or other lab activities to run their course unattended, and to provide a break from the burden of multiple levels of PPE required in the lab (gloves, goggles, masks, lab coats, etc...) which can become overbearing after many hours. Office access during shifts further distributes and distances building occupants. Under this use, office access is not considered as replaceable by teleworking.

Eating in office in Yellow – 1

Eating in offices is allowed in Yellow – 1 as of July 16, the following guidelines apply:

- Eat at the kitchenette tables not your desk, they are easier to keep clean
- Only one person should eat at a time
- Before you eat, sanitize the table and any parts of the chair you will touch
- Remove your mask, and eat sensibly quickly
- Replace your mask and sanitize the table and any parts of the chair you touched

Please note !!!

The air-handlers that serve Steidle laboratories exchange the air many times per hour and do so with 100% outside air. Airborne particulates of any kind in that space are not recirculated.

The air-handlers that serve Steidle offices, hallways, and common areas also exchange air multiple times per hour, but do so with a combination of outside air and air recirculated from multiple spaces. That air is filtered with a MERV8 filter which offers 90% efficiency at trapping particles from 3 μm to 10 μm . Filtration efficiency of small particles (*i.e.*, 120 nm diameter SARS-CoV-2 virus) is very low.

Penn State is currently being advised by an engineering study of commercial spaces and the COVID-19 transmission risk associated with aerosolized virus particles distributed by HVAC systems. The study concludes that this transmission mode is finite but very small, it can be found here: <https://tayloengineers.com/taylor-engineering-covid-19-whitepaper>

11.2 Lavatory Usage

- One person max occupancy
- Doors will be propped open
- Use automatic light as guidance on occupancy
- Enter slowly, and determine if in use
- Handwashing prior to leaving lavatories is mandatory

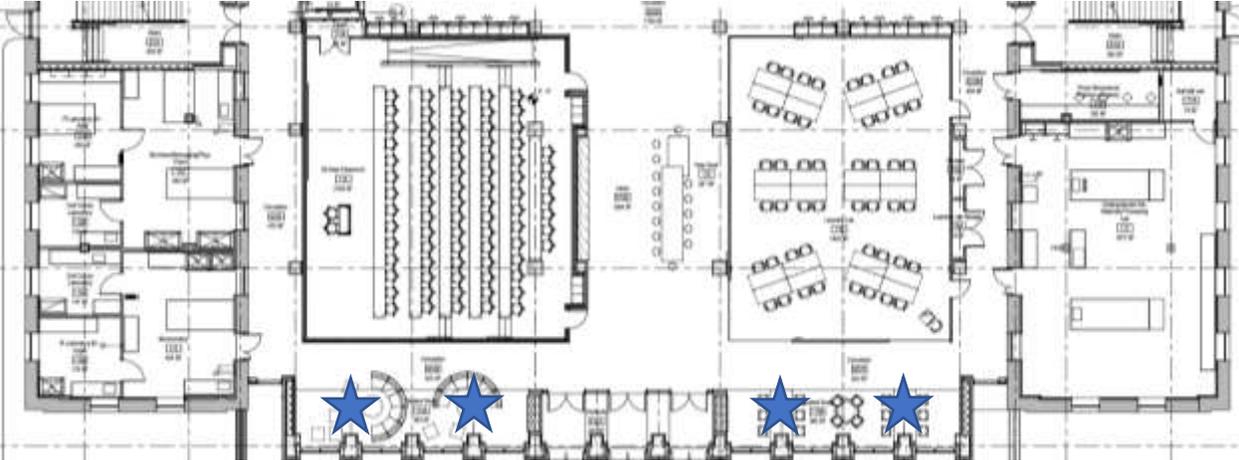
11.1 Eating in Steidle – Outside of Grad Offices

Eating is only allowed by individuals in their own single-occupancy offices, no eating in labs or shared spaces. This policy will be revisited and re-evaluated as building operations return towards normal.

Water fountains will be cleaned and disinfected by OPP with approved cleaners once per day.

12 Overflow Space

We recognize that work flow of some individuals warrants access to office space during shift. For those individuals several small tables with one chair each will be positioned opposite the first floor computer room and large classroom. See location on the map below – blue stars.



13 Reporting

Awaiting university developments regarding a Covid-19 hotline

Any individual that has concerns regarding any aspects of safety in Steidle are encouraged to notify the safety committee at safety@matse.psu.edu immediately. All information will be handled anonymously.

If you suspect that you may have been exposed or that others may have been exposed you should follow the COVID-19 Instructions for Supervisors Assessment and Reporting that can be found in the following URL:

<https://ehs.psu.edu/sites/ehs/files/covid19-supervisorinstructions.pdf>

14 e-buddy

We recognize that under reduced laboratory usage, there will likely be times when you need to work alone in a laboratory. If you are in this situation, use the e-buddy system following the e-buddy SOP below:

1. Reach out to a trusted person who can be your virtual buddy (ebuddy) and confirm they are available and willing to serve as your buddy during your essential research work.
2. Communicate the building, room number and nature of work to your ebuddy and the ebuddy must confirm receipt of this information.
3. Decide on the best way to stay in contact. This can be via text, phone call, open phone line, or video chat, Facetime etc.
4. Laboratory activities that present a particular safety risks, *i.e.*, working with strong acids, flammable gasses, extreme high temperatures, *etc...* should not be conducted with an ebuddy.
5. When arriving at the lab to do research, make contact with your ebuddy.
6. Contact between you and your ebuddy should occur at least once every 30 minutes unless you and your ebuddy are maintaining contact continuously via video or open phone line.
7. The ebuddy is completely responsible for monitoring the safety and well-being of the person doing the work in the lab and should be committed to making this task a top priority.
8. Set a timer if needed to ensure contact is maintained within the required contact time.
9. If the 30 minute time for contact has been exceeded then call University Police Services at 863-1111 or 911. They should provide the name of the person in the lab, building and room number.
10. Upon completion of work check in with the ebuddy to let them know work is completed and you have safely exited the laboratory.

15 Training, Safety Policies, and Enforcement

- All researchers (including PIs) must follow laboratory safety procedures as prescribed by EHS and MatSE, for their own safety as well as that of their colleagues.
- MatSE safety training and EHS Initial Laboratory Safety/ Hazard Communication Training must be completed before working in any Steidle Building laboratory.
- Not following any aspect of these policies, accidental or intentional, constitute a safety infraction.

14.1 Covid-19 specific training and documentation

- 1. All individuals that wish to access Steidle under conditions orange and yellow must review this document and indicate by virtue of a signed copy (see signature panel at the end of this page) that (1) they understand all of the information contained within, and that (2) they commit to follow all recommended practices and procedures contained within.**
- 2. All Steidle PIs must conduct, record and archive with the safety committee a Zoom (or equivalent) meeting where they review the MatSE safety plan with all of their group members. This will be a requirement for transitioning to code Yellow.**

14.2 Covid-19-specific compliance violation protocols

All safety violations are categorized into three classes of infraction, violations specific to Covid-19 protocols are now included as follows:

Class I: Actions that could only affect only the researcher involved: **N/A**

Class II: Actions with potential to affect others, but don't present an immediate danger:

Accidental disregard of University and MatSE COVID-19 procedures

(e.g., social distancing, sanitization, PPE use, adherence to shifts and hour limits, ...)

1st infraction: Warning and notification of supervisor/advisor

2nd infraction: Building access removed and letter added to personnel file

Access restored after (1) Meeting with department safety committee and advisor to address non-compliance and (2) MatSE safety training re-taken

Class III: Actions that present an immediate danger to others:

Intentional disregard of University and MatSE COVID-19 procedures

(e.g., social distancing, sanitization, PPE use, adherence to shifts and hour limits, ...)

1st infraction: Building access removed and letter added to personnel file

Meeting scheduled to consider restoring access with safety committee, advisor and department head

Additional infractions and repercussions in any Class will be handled on a case-by-case basis.

I understand this document and

commit to follow all policies contained within:

_____ name

_____ date

16 Covid Messaging

Posters will be put on easels at building and primary lab corridor entrances, for example:



Appendix

17 State of MatSE Preparations

April, 2020 – MatSE Safety Committee collected a research-informed plan identifying best practices for returning to research. Much of the research was developed with the MRI safety committee. In parallel, the committee also started to acquire PPE, signage, and cleaning supplies.

May 6, 2020 – MatSE town hall meeting was conducted with all Steidle occupants to review the Covid-19 threat, measures to minimize it, and initial ideas for a comprehensive set of Steidle policies and procedures. With feedback from this meeting, the Safety Committee took the presentation information and distilled it into the present document.

May 10, 2020 – The MatSE plan for return to research (RTRP) working document was circulated to the Steidle faculty members for review.

May 11, 2020 – The MatSE Safety Committee hosted a town hall to all Steidle Faculty during which the RTRP was reviewed, and feedback was solicited. With this information, a final master document was produced and subsequently provided to all Steidle users for review.

May 19, 2020 – The MatSE Safety Committee hosted a town hall to all Steidle occupants. During this meeting, the RTRP was formally reviewed in detail to ensure that the information was clear and accessible.

Summary of Training

We recognize that preparations for safe laboratory operations are complex and multifaceted and will require that we change culture. To facilitate this process we have implemented a layered structure for training. All researchers will have experience the following before Code Yellow in this plan:

1. Town Hall #1: Education on Covid-19 and how to be safe in this context.
2. Town Hall #2: Formal discussion of the Steidle RTRP master plan.
3. Steidle users will review the plan individually, and sign and submit to MatSE Safety a copy of the RTRP indicating that they understand the content and will follow all procedures and policies.
4. All Steidle groups will hold and record Zoom meetings where they review the RTRP with their entire group. These meetings will be archived by MatSE Safety.

Update: At the time of this submission (May 22) All Steidle occupants held and their meetings with research groups to discuss this MatSE Master Plan, and 92/94 Steidle researchers signed and filed their training certifications. All certificates and recordings of meetings are archived on Box and available for review.

Appendix

18 Code Orange Transition

To facilitate the transition to code orange, we have identified a list of critical individuals that will facilitate preparations that enable a return to research in a safe environment. All department members have been informed several times that **Orange is NOT for research**.

The current list, updated and submitted to the EMS ADGER, can be found in the linked XL file.

Condition Orange - Essential Employee List					
Area	Name	Access ID	Title		PI
MatSE	William White	wnw5027	Postdoc		Hickner group
MatSE	Lachlan Peeke	lpm5527	Grad		Hickner group
MatSE	Yifan Deng	ywd5091	Postdoc		Hickner group
MatSE	Cole Britt	cabp963	Grad		Beese group
MatSE	Shipin Qin	svq5030	Grad		Beese group
MatSE	Katy Gerace	ksg5199	Grad		Mauro group
MatSE	Anthony DeCeanne	avd40	Grad		Mauro group
MatSE	Rob Hickey	rjh64	PI		Hickey group
MatSE	Jake LaNasa	jzl293	Grad		Hickey group
MatSE	Yifan Xu	yzx56	Grad		Hickey group
	Mike Chung	tcc3	PI		
MatSE	Houxiang Li	hzi51072	Grad		Chung group
MatSE	Joseph Vandy Sengeh	jvs21	Grad		Chung group
MatSE	Gary Messing	glm2	PI		Messing group
MatSE	Rebecca Walton	rv25155	Grad		Messing group
MatSE	Michael Brova	mjb5892	Grad		Messing group
MatSE	Beecher Watson	bhw5031	Grad		Messing group
Chem E	Stephen Wong	shw5131	Grad		Gomez group
Chem E	Sang Yoo	suy60	Grad		Gomez group
Chem E	Zixuan Guo	zgz30	Grad		Gomez group
Chem E	Jame Sutjianto	jgs267	Grad		Gomez group
MatSE	Kevin Ferri	kzf84	Grad		Maria group
MatSE	Sarah Lowum	sml92	Grad		Maria group
MatSE	Amin Nozariabmarz	aln192	Postdoc		Priya group
MatSE	Sanghyeok Im	svi5106	Grad		Kim group
MatSE	Daniele Parisi	dkp5401	Postdoc		Colby group
MatSE	Josh Bostwick	jeb86	Grad		Colby group

We will assign two individuals per research group with exceptions for those with particularly large instrument sets. ***This cohort has been trained that Code Orange is NOT for research, but preparing for research*** when Code Yellow conditions are announced. Code Orange activities that have been recommended for each group by the Safety Committee include:

- Decluttering labs
- Ensuring safety equipment is functional
- Cleaning instrumentation
- Distributing Covid-19 PPE and cleaning/sanitization chemicals and paper towels
- Organizing lab instrumentation to facilitate social distancing

Appendix

19 Code Yellow Transition

When our department and Steidle building are approved for transition to code yellow, two things need to be established to allow occupancy:

1. The labs need to be inspected by Dean Hellmann and approved for use on a lab-by-lab basis as soon as the building is OPP approved for occupancy.
2. The Code Yellow participants need to be filed by the department Safety Officer. The Code Yellow team, at the time of Code Yellow announcements, will be those Steidle occupants that have completed their training, *i.e.*, read and signed and filed this RTRP plan, and participated in a Zoom review of that plan with their advisor.

Note: You were email-invited to the Box folder where the plans can be uploaded by Peg Yetter on 5/19/2020 at 9:15 pm.

20 State of PPE and Sanitization Supplies

Face masks

On 5/18 the safety committee had a meeting with all Steidle building PIs to review safety planning and procedures. In that meeting all faculty indicated that they were in possession of sufficient masks for their groups to operate for several weeks at minimum. In addition, the safety committee procured more than 2000 masks to ensure that all have equal access, with an additional 1000 scheduled for delivery. While it is difficult to say explicitly, conservative estimations indicate several months of supply. Many additional masks are on order, and vendors with inventory that is ready to ship have been identified.

Hand sanitizer

The safety committee acquired 12.6 liters of hand sanitizer that will be distributed to laboratory and building entrances. We calculate conservatively that under yellow-1 this is a one-month supply.

Sanitization solution

The safety committee acquired spray bottles for all lab entrances. All will be filled daily with the CDC recommended formula of bleach and water to ensure that the solutions retain their efficacy. We have > 4 months of supply.

Paper towels

For lab entrances we currently have sufficient paper towels for 12 weeks of laboratory entrance and exit. To the best of our knowledge, General Stores can provide more on demand.

Hand soap

Wall mounted soap dispensers have been installed in all sinks adjacent to lab entrances. Refills are readily available through general stores.

Appendix

21 Scram-Down Plans

Each PI must prepare a scram-down plan detailing the process for stopping all laboratory work in a safe manner that does not damage equipment. The plan should include:

- Procedures to shut down equipment
- Number of people required to do so
- Time needed to shut down
- Chemical hygiene

Adair Group

Turn off all specified equipment and wipe down immediate vicinities around equipment and counter space that has been used with Isopropanol - Water solution

Room 112A Analytical Lab 1 person - 30 minutes

1. Turn off and wipe down Brookhaven OMNI DLS System, Microtrac DLS Systems and open counter space in immediate area. 1 person - 5 minutes
2. Turn off and wipe down Nanodrop UV-vis spectrometer. Wipe down it and open counter space in the immediate area. 1 person - <5 minutes
3. Turn off and wipe down 96 well plate fluorimeter and UV-vis systems. Wipe down it and open counter space in immediate area. 1 person - <5 minutes
4. Turn off and secure fume hood. Wipe down open counter space and outside fume hood. 1 person - 5 minutes
5. Turn off and wipe down Sensadyne Dynamic Tensiometer and open counter space. 1 person - <5 minutes
6. Turn off and wipe down Fleximatic Rotary Mixer, Clean open counter space around this device. 1 person - <5 minutes
7. Turn off and wipe down Experion 360 Gel Electrophoresis System. 1 person - <5 minutes

112B Cell Culture Room 1 person - 12 minutes

1. Wipe down open counter space. 1 person 10 minutes
2. Ensure that Biosafety Hood remains ON to ensure a sterile working area. 1 person - 1 minute
3. Make sure door into 112B is securely closed and locked. 1 person - <1 minute

112 Main Room - 1 person 20 minutes

1. Wipe down all open benchtop work areas - 1 Person - 15 minutes
2. Turn off and wipe down centrifuges - 1 person - 5 minutes
3. Wipe down outside and inside areas of 6 foot fume hoods. 1 person - 10 minutes

4. Wipe down area in and around the marble balance table and balances. 1 person - 5 minutes
5. Check to make sure that water distillation - deionization system is ON. 1 person - <1 minute

118B Milling Lab, East side of room 1 person - 30 minutes

1. Turn off Union Process Attrition Mill in Walk-in Fume Hood. Wipe down mill and bench in the fume hood. 1 person - 5 minutes
2. Turn off Hydrothermal System in 2nd Walk-in Fume Hood. Wipe down countertop and hydrothermal system. 1 person - 10 minutes
3. Make sure circulator is ON and the TA viscometer is turned off. 1 person - <1 minute
4. Make sure the Horiba CAPA 750 Particle Size Centrifuge is off and wipe down it and counter. 1 person - <1 minute
5. Turn off balance and wipe down it and surfaces in immediate vicinity. 1 person - <1 minute
6. Wipe down benches on East side of 118 B. 1 person - 5 minutes
7. Turn off the Centrifuge and wipe down it and the benchtop on West side of 118B. 1 person - 5 minutes
8. Make sure water is off in the sink. Wipe down the area around the sink. 1 person - <5 minutes

Adair Group Bench Space and Fume Hoods to be Assigned in SE Corner of 218 Steidle Building 1 person - 30 minutes

1. Turn off Microtrac Particle Size Analyzer and wipe down it and bench in immediate vicinity. 1 person - <5 minutes
2. Turn off pH meter and wipe down it and bench in immediate vicinity - 1 person - < 5 minutes
3. Secure vortex and other small mixing apparatus and wipe down them and bench in immediate area. 1 person - < 5 minutes
4. Turn off centrifuge and wipe down it and bench in immediate area. 1 person - <5minutes
4. Turn off any other small apparatus and wipe down them and bench in immediate area. 1 Person - <5minutes
5. Wipe down both 6 foot fume hoods and equipment/apparatus present inside and out. 1 person - 15 minutes

Beese group

MTS Dual-actuator hydraulic test frame (5 minutes, 1 person)

1. Move the horizontal actuator to the zero-point position
2. Place cushions between the grips
3. Turn the pump off from the computer (do it from high to low), then turn off the computer
4. Record pump hours
5. Turn the knob off from the pump machine
6. If the DIC system is used, also follow the DIC system procedure outlined below

Keyence microscope (5 minutes, 1 person)

1. Backup the data
2. Turn the computer off
3. Turn the microscope off, cover the lenses with caps
4. Cover up the microscope

Vickers microindenter (5 minutes, 1 person)

1. Backup the data
2. Turn the computer and the microindenter off
3. Cover up the microindenter
4. Put the USB key in the drawer next to computer

MTS tabletop servo-mechanical test frame (2 minutes, 1 person)

1. Turn the machine and the computer off
2. If the DIC system is used, also follow the DIC system procedure outlined below

MTS floor servo-mechanical test frame (2 minutes, 1 person)

1. Turn the machine and the computer off
2. If the DIC system is used, also follow the DIC system procedure outlined below

Instron tabletop servo-mechanical test frame (2 minutes, 1 person)

1. Turn the machine and the computer off
2. If the DIC system is used, also follow the DIC system procedure outlined below

Instron floor servo-mechanical test frame (2 minutes, 1 person)

1. Turn the machine and the computer off
2. If the DIC system is used, also follow the DIC system procedure outlined below

Mini tensile test stage (5 minutes, 1 person)

1. Disconnect the test stage with the control box, put up the cameras into its box
2. Turn the control box off
3. If the DIC system is used, also follow the DIC system procedure outlined below

DIC system (10 minutes + data backup time, 1 person)

Scram-Down (shut-down) Plan

Chung Group

Benchtop Reactor - (1 person – 10 minutes)

Turn off the heater

Add deactivation agent to stabilize or naturalize the chemicals

Turn off stirrer, cooling water, then power supply

Close hood window

Pilot-Plant Reactor - (1 person – 20 minutes)

Turn off the heater and wait for cooling down to the safe temperature

Add deactivation agent to stabilize or naturalize the chemicals

Turn off the stirrer, cooling water, then system power

Turn off the computer and power supply

Close the doors

DryBox – (1 person, 10 minutes)

Turn off the circulation system

Close inlet and outlet valves to the box

Turn off the vacuum pump

Release vacuum inside the transfer chamber

Inflate the drybox with argon gas to maintain inert atmosphere

Turn off the power

Volumetric Gas Sorption Apparatus (1 person – 5 minutes)

Turn off the valves to gas tanks

Remove the cooling bath

Release gas pressure in the system

Lock the transducer

Turn off the computer

Mixer/Extruder (1 person – 5 minutes)

Turn off both heating and agitation systems

Remove all mixed material in the mixer or extruder

Lock the transducer

Turn off the computer

Benchtop Fiber Melt-Spinning Machine (1 person – 5 minutes)

Turn off the heating system

Switch off power to extruder and winding mill

Remove all polymer (pellets and fibers) in the system

Vacuum Film Compressor (1 person – 2 minutes)

Turn off the heater and cooling water

Turn off vacuum pump and then release vacuum in the compressor

Remove material in the mold

Compress Molder (1 person – 2 minutes)

Turn off the heater

Turn off the vacuum compressor

Bi-Axial Film Stretcher

Turn off the heater

Turn off the computer

Turn off the power supply

Oil-Bath Viscometer (1 person – 2 minutes)

Turn off the heater and stirrer in the instrument

Remove all flowing tube and samples

Turn off the computer

Chemical Hygiene – (2 people - 30 minutes)

Survey areas for chemical waste and tag waste using normal procedure
Clean lab benches and equipment

Colby Group

DRS - (1 person – 5 minutes)

Turn off vacuum pump (open pressure valve only on old DRS)
Turn off the power, vacuum. (Turn off cryostat only on new DRS)
Close software
Turn off computer

TA Ares – G2 (1 person – 5 minutes)

Turn off the cooling system.
Turn off the instrument.
Close the nitrogen gas valve.
Close convection oven.
Lock the transducer.
No tools (fixtures and thermocouples) must be left installed in the instrument.
Make sure the compressed air still feeds the instrument.
Close the software and turn off the computer.

Anton Paar MCR – 502 (1 person – 5 minutes)

Turn off the light source.
Close all the valves for nitrogen gas and compressed air for cooling.
Turn off the instrument.
No measuring fixtures must be left installed in the instrument.
Install the protection cap for the transducer.
Cover the glass plate with a soft material (cleaning wipes for instance).
Make sure the compressed air still feeds the instrument.
Close the software and turn off the computer.

Rheometrics Ares - LS (1 person – 5 minutes)

Close the nitrogen gas valve.
Turn off the instrument.
Close the convection oven.
No tools (fixtures and thermocouples) must be left installed in the instrument.
Make sure the compressed air still feeds the instrument.
Lock the transducer.
Close the software and turn off the computer.

TA DHR-3 - (1 person – 5 minutes)

Close the nitrogen gas valve.

Turn off the instrument.
Turn off the cooling bath for the Peltier cell.
No tools (fixtures and thermocouples) must be left installed in the instrument.
Make sure the compressed air still feeds the instrument.
Install the protection cap for the transducer.
Close the software and turn off the computer.

DSC (1 person – 5 minutes)

Turn off nitrogen source and chiller if still on
Turn off instrument
Close software and turn off computer

Olympus Microscope – Linkam Shear Cell (1 person – 5 minutes)

Turn off the shear cell.
Turn off the pump for the water circulation.
Turn off the microscope.
Cover the microscope-
Close the software and turn off the computer.

Rosand dual barrel capillary rheometer (1 person – 5 minutes)

Close the Argon valve of the gas cylinder.
Close the plastic window in the inlet area.
Turn off the instrument.
No tools (pistons and pressure transducers) must be left installed in the instrument.
Close the software and turn off the computer.

Vacuum compressors for the ovens (1 person – 5 minutes)

Close the Argon valve of the gas cylinder where present.
Make sure the ovens are under vacuum with the vent valve fully closed.
No intervention on the temperature control is needed.
Unplug the compressor from the electric network.

Viscometer (1 person – 2 minutes)

Turn off the instrument.
No measuring tools must be left installed in the instrument.
Close the software and turn off the computer.

Press-mold device (1 person – 2 minutes)

Turn off the vacuum compressor.
Turn off the heater unplug it from the electric network.

Liquid nitrogen dewars (1 person – 5 minutes)Count the number of dewars and write down approximately the amount of liquid nitrogen left.Close all the valves.

Chemical Hygiene – (2 people - 30 minutes)

Survey areas for chemical waste and tag waste using normal procedure

Clean lab benches and equipment used with IPA

Gomez Group

Double glovebox (20 min)

1. Turn off the hotplates and spin coater
2. Make sure spin coater vacuum is off
3. Make sure the antechambers' valves are in the **evacuate** position

Battery glovebox (10 min)

1. Clean interior and terminate any active experiments. Turn off the hot plate. Close all open containers except for the Li metal waste
2. Make sure tank is near full. If not, place and order for a new one.
 - a. Call 814-238-5092 and select option to speak with someone at the local office
 - b. Provide them account number 74223343
 - c. Request liquid argon tank 180-230
 - d. Delivery usually occurs the next business day. You will need to change the hose from the old tank to the new one
3. Check O₂/H₂O levels and pressure. Notify Ryan if there are any issues
4. Make sure the large antechamber is **under vacuum** but in the **closed** position
5. Make sure the small antechamber is in the **evacuate** position
6. System status should be monitored weekly and new tanks should be ordered as needed (typically about once a month)
- 7.

Synthesis glovebox (20 min)

1. Turn off hot plates
2. Set glovebox pressure to 7-9 psi
3. Make sure antechambers' valves are in the **closed** position

Zone annealing glovebox (0 min)

Glovebox currently awaiting upgrades and thus shut down not needed

Differential Refractometer(s) (18 min)

1. Stop experiment
2. Flush port 1 with 10 ml of test solvent at a rate of 1-2 drops a second (~10-15 min)
3. Unscrew tubing and immediately recap ports (~1 min)
4. Turn off the DNDC using the button on the back (~30 sec)
5. Wipe off tubing and place in bag (~30 sec)
6. Safely dispose of solvent in proper waste receptacles (~30 sec)
7. Re label dn/dc with the solvent used and the date (~30 sec)

RFS-3 Rheometer (14 min)

1. Stop experiment
2. Remove sample (~ 5 min)

3. Remove all geometries (~ 5 min)
4. Turn off Julabo (~ 1 min)
5. Check that air pressure is 30 psi (VERY IMPORTANT*) (~ 1 min)
6. Turn off rheometer (~ 1 min)
7. Cover bottom tool holder to prevent dust or moisture entering the motor (~1 min)

*Compressed air pressure needs to be maintained at 30 psi at all times to prevent transducer damage

Dynamic Light Scattering (10 min)

1. Turn off the switch at the back of solvent (decalin) pump
2. Remove sample vial and cover sample chamber with the lid
3. Close the detector shutter (Close the pinhole by setting the dial to C)
4. Shut off the laser (turn off the key on the front and flip off the switch at the back of laser control box)
5. Set the detector to 150 degrees
6. Turn off the “laser in use” sign
7. Exit software and shut off the computer
8. Unplug all the electrical connections to: (1) Laser box, (2) Decalin pump, (3) workstation, (4) goniometer assembly

Solar simulator (5 min)

1. Close the shutter
2. Turn off the lamp
3. Wait for fan to turn off
4. Turn off the switch on the solar simulator
5. Turn off the solar simulator laptop
6. Unplug all the electrical connections in the workstation

Vacuum ovens (5 min)

1. Shut off vacuum pump and oven if on
2. Slowly open the pressure release valve on the front of the box, refilling the chamber with air
3. Empty and wipe-down the interior

Rotovap (1-5 min)

The rotovap should be turned off when not in use. Individuals trained to use it know how to turn it off.

1. If on, in order turn off: the hotbath, the chiller, the pump, then the vacuum controller

GPC (120-180 min)

1. Make sure flow rate 0.1 mL/min
2. Open purge valve
3. Reroute solvent lines to around columns and plug column side to prevent solvent evaporation
4. Switch solvent to isopropyl alcohol
5. Increase flow rate to 0.5 mL/min for 20 min

6. Make sure no bubbles in purge line, decrease flow rate to 0.1 mL/min
7. Close purge valve, wait for 10 min
8. Increase flow rate to 0.5 mL/min for 1-2 hours
9. Decrease flow rate to 0.1 mL/min
10. Turn off instrument
11. Turn off computer

UV-vis (5 - 10 min)

1. Logout the software;
2. Turn off the lamp; Shutdown the instrument press the “disconnect” button (should be at the bottom of the screen);
3. Turn off the instrument off using “Power ON/OFF” button and shut the computer down;
4. Unplug all instruments.

Fluorometer (1-5 min)

The fluorometer is turned off when not in use and usually is only turned on for hours at a time. Each person trained to use it should turn it off when they are done using it.

1. When turned on, first turn off motor boxes (two red buttons on box controllers)
2. Next turn off the circuit attached to the laser, to power off the laser without using its on-off switch
3. Finally turn off the computer controlling the fluorometer if necessary

Deadend Filtration Cells (10 min)

1. Seal primary valve on all nitrogen tanks
2. Purge lines to active cells
3. Seal secondary valve on all regulators
4. Empty and clean any active cells

Chemical hygiene (30 min)

Inspect lab to identify chemical waste, and package and tag all waste for pick-up using normal procedures

Keithley 4200 parameter analyzer (connected to probe station inside the small glovebox) - 2 min

1. Turn off all the software currently displayed on the parameter analyzer
2. Shut down the windows OS of the parameter analyzer first, then turn it off safely by pressing the power button after the OS has shut down.
3. Also, there is a separate computer that is used to turn on/off the microscope. Shut down the computer as well.

Optical Microscope (5 min)

1. Close any software open on the computer then turn off computer.
2. Unplug electrical cord for the microscope.

PVT Chambers (2 min)

1. If crystallization is in progress, unplug the heat rope box from the outlet (far left side of hood) and close the nitrogen valve inside the hood (orange).
2. Ensure hood sash down (as far as the nitrogen line will allow).
- 3.

Elga UltraPure Water System (0 min)

1. The Elga system can be left on during the duration of the shut down
2. If we choose to shutdown, the system can be shutdown by unplugging.

Hickey Group (two people in the laboratory)

2 Size-exclusion chromatography instruments (1 hour, 1 person)

The instruments will need to be turned to standby mode to prevent damage. The procedure to switch to standby mode is initiated in the software interface and will gradually ramp down the flow rate of the sample and reference lines. The instrument oven will be maintained at its operating temperature (40 °C). The flow rate of the sample and reference columns should be decreased to the inactive flow rate (0.15 mL/min). The flow rate will be changed through the control panel tab of the EcoSEC UI. The standby procedure will take an hour to reduce flow. The light scattering detector attached to the instrument will need to be shut off by using the switch on the front panel of the detector. The solvent reservoir should be filled, and the Wyatt controller should be in “Recycle” mode.

1 Glovebox (20 minutes, 1 person)

Adequate argon supply (greater than $\frac{3}{4}$ of a tank) should be hooked up to the glove box regulator with a flow rate of 50-55 psi. The user should check through the alert panel on the controller that flow rate is great enough to open the supply valves. If the regulator is set under 50 psi, the supply valves will not open. The box pressures upper and lower limits should be set to 14.5 and 11.5 mbar, respectively. This can be accomplished by accessing the “Box parameters” tab in the controller menu.

If possible, 15 minutes of monitoring should be conducted to ensure that box pressure is stable at high positive pressure. Box pressure should be constant in the “Box Trend” menu. Argon circulation should be kept on. Essential users should periodically check the argon tank level, pressure history, and O₂ levels.

2 Vacuum ovens (5 minutes, 1 person)

If the oven is on, the oven controller switch at the front of the oven should be turned off. The vacuum pump should be shut off and all vacuum valves should be opened to atmosphere.

5 Synthesis lines (5 vacuum pumps, 5 minutes each pump, 1 person)

The valves on the top of the vacuum pumps that connect the pumps to vacuum lines should be switched into the “shut” position. After the valve has been shut, the pump power switches can be turned off. Do not shut the pump power off before closing the valve, as the negative pressure of

the vacuum line can pull oil into the line. Once closed from the pumps, the valves of the Schlenk and vacuum lines can be twisted open to atmospheric pressure.

1 Solvent system (10 minutes, 1 person)

Check the pressure of gas cylinder; turn off the knobs connecting solvent tanks and columns; turn off the power.

Gas cylinders (2 minutes, 1 person)

Close the main valve of all gas cylinders in the lab (not the gas tanks associated with the glovebox).

Chemical hygiene (5 minutes, 1 person)

Check chemical waste satellite area and report waste pick-up to EHS if needed.

Hickner Group (Two people in the laboratory)

Four 3D printers (1 person - 30 minutes total)

- Remove feedstock to prevent curing in the machine.
- Put feedstocks in chemical waste or chemical storage.
- Turn off all power supplies.
- Release pressure system.

5 chemical fume hoods (2 people - 40 minutes total)

- Turn off all hot plates.
- After cooling below boiling point of mixture, stop condenser cooling water.
- Can leave reactions at room temperature.
- Cap reaction mixtures in reaction flasks, as needed, if they can't be exposed to air.
- Turn off Ar flow.

Membrane processing area (1 person - 5 minutes)

- Turn off all ovens.
- Turn off vacuum pumps.
- Put solvent-containing samples in hood.
- Turn off circuit breaker for water still.

FTIR/optical lab (1 person - 5 minutes)

- Power down instruments.
- Label and store sample.

Glovebox (1 person - 15 minutes)

- Secure samples and turn off heat/stir plates.
- Switch from liquid argon to argon gas cylinder.
- Set box to standby.
- Sanitize glove box.

Chemical hygiene (2 people - 30 minutes total)

- Survey lab for chemical waste, package and tag all waste for pick-up using normal process.

Kim Group - with 2 people in the laboratory:

8 crucible furnaces, 1 box furnace (5 minutes, 1 person)

Turn off all furnaces, if a furnace program is running, it can be allowed to finish provided the program allows it to automatically idle when complete. Turn off the chilled water loop or house water lines once the test chamber temperature is below 100 °C.

1 tube furnace (5 minutes, 1 person)

Turn off furnace. If furnace tube is under vacuum, the vacuum pump may be turned off once the furnace temperature is below 100 °C. If argon is flowed through the tube furnace, the argon flow can be stopped once the furnace temperature is below 100 °C.

Arc melter (5 minutes, 1 person)

Turn off the main power, turn off the chilled water loop, and close Ar gas cylinder.

Induction melter (5 minutes, 1 person)

Turn off the main power and turn off the chilled water loop.

Thermal analyzer (15 minutes, 1 person)

If experiment is running, allow it to finish, it can remain in idle mode. If experiment is not running, turn off main unit. Close gas cylinder. Perform data backup.

5 potentiostats (15 minutes, 1 person)

Turn off the potentiostat, if a control program is running, it can be allowed to finish. When active experiment is complete, disconnect the electrical cables from an electrochemical cell and turn off the power. Perform data backup.

Process gasses (15 minutes, 1 person)

Turn off all gas cylinders at the main valve for all, they can remain pressurized with an exception of Ar gas cylinder connected to gloveboxes.

3 Gloveboxes (15 minutes, 1 person)

Keep the glovebox in operation (recirculation) mode. Turn off lights.

Vacuum pumps (5 minutes, 1-2 people)

Turn off any vacuum pumps, with an exception of vacuum pumps connected to gloveboxes or vacuum pumps connected to test chambers/furnaces at temperatures greater than 100 °C. Allow the chamber/furnace to cool to lower than 100 °C and then shut off the vacuum pump(s).

Mini-lathe (5 minutes, 1 person)

Turn off the main power and remove any debris from use.

Low-speed saw (5 minutes, 1 person)

Turn off the main power, clean blade, and store blade and other saw accessories.

Chemical hygiene (30 minutes, 1-2 people)

Survey lab for chemical waste, package and tag all waste for pick-up using normal process.

Maria Group - with two people in the laboratory:**6 sputter deposition tools and 1 e-beam deposition tool (5 minutes)**

Turn off all sources and source power supplies

Close gate valves to pumps and isolate with backing valve, turn pumps off, vent backing line

2 PLD tools (2 minutes)

Turn off all sources and source power supplies

Close gate valves to pumps and isolate with backing valve, turn pumps off, vent backing line Turn of laser at key switch

Powder processing area (5 minutes)

Turn off all furnaces, if a furnace program is running, it can be allowed to finish provided the program allows it to automatically idle when complete

Turn off all small equipment

Drying oven – allow to idle at 85 °C

X-ray diffractometer (5 minutes)

Power down tube, turn off main unit using front panel switch, turn off chiller Perform data backup

Calorimeter (5 minutes)

If experiment is running, allow it to finish, it can remain in idle mode If experiment is not running, turn off main unit using front panel Perform data backup

AFM (2 minutes)

Turn of unit at the controller Perform data backup

Process gasses (2 minutes)

Turn off all gas cylinders at the main valve for all but UHV instruments, they can remain pressurized.

Central chilled water loop: Turn off chiller (1 minute)**Chemical hygiene (30 minutes)**

Survey lab for chemical waste, package and tag all waste for pick-up using normal process

Mauro Group

Location: Steidle 125

Primary emergency contact: Katy Gerace, ksg5199@psu.edu, 267-218-0344

Secondary emergency contact: Anthony DeCeanne, avd40@psu.edu, 309-363-5807

Number of people to shut-down lab: 1

3 Melting Furnaces (1 minute)

Turn off power source on control panel for each individual furnace

1 Draw Tower Furnace (1 minute)

Turn off power source on control panel

1 Viscometer (5 minutes)

Make sure the spindle is removed from the glass before shut-down. This is important because the spindle will rotate every time the equipment is turned on which could damage the platinum crucible.

Turn off the equipment at the back of the controller.

Turn off the water recycle system.

5 Annealing Furnaces (1 minute)

Turn off power source on control panel for each furnace

Chemical Hygiene (5 minutes)

Survey countertops for chemical bottles used for preparing glass. Make sure lids are tightly sealed on chemical bottles and placed in chemical storage closet.

Priya Group (two people in the laboratory)

ZEM 3 – Ulvac (1 minute)

Turn off the software and equipment power.

Turn vacuum pump off, turn off chiller, close helium gas valve from main cylinder.

Differential Scanning Calorimetry (DSC) (2 minute)

Close the program, if running and turn off the equipment power.

Turn off cooling unit, close argon gas valve from main cylinder.

Laser flash (2 minute)

Close the program and turn off the equipment power.

Turn off vacuum pump, turn off chiller, close argon gas valve from main cylinder.

Lakeshore-8400 (5 minutes)

Close the program, turn off the magnetic field.

Vent the system, turn vacuum pump off, turn off chiller, close gas valve and switch off main power.

Spin melting (2 minutes)

Turn off the power, vent the main chamber.

Turn vacuum pump off, turn off chiller, close gas valve from cylinder.

Induction Heater (2 minutes)

Turn off the power,

Turn off chiller, close gas valve from cylinder.

Muffle Furnaces (100 minute)

Stop the program if a furnace program is running, wait ~100 minutes to reach the furnace temperature below 200°C and turn off the equipment power.

Tube Furnaces (100 minutes)

Stop the program, if a furnace program is running, wait ~100 minutes to reach the temperature below 200°C, vent the tube, close argon valve, turn off vacuum pump, close argon gas valve from main cylinder.

Hot plates (2 minutes)

Turn off all the hot plates in the lab and inside the fume hood

Dicing machine (2 minutes)

Stop the program, turn off the equipment power, turn off the air from building supply, turn vacuum pump off, turn off water tank, turn off power source (transformer?) turn off microscope.

Wire saw (1 minute)

Close the program and turn off equipment power, turn off water pump.

Module power and cooling test stations (5 minutes)

Close the labview programs, back off the data.

Turn off all the temperature controllers and power supplies/meters, turn off turbo pump and backing pump and chiller.

High Energy ball milling stations x3 (10 minutes)

Stop the program, remove the jar from the machine and transfer to the glove box, and switch off the power.

Gas tanks (2 minutes)

Make sure all gas cylinders are closed from main valve except for globe box.

Glovebox (0 minutes)

Let glovebox run, keep vacuum pump running, **do not** close gas valve, keep transfer chamber under vacuum.

Undergraduate/User-facilities Laboratories

In all cases, users will spend up to 5 min cleaning up work areas and removing their experimental materials after powering down equipment. Equipment that is run using the computer-login system will automatically shut down once any current reservations are complete. Users do not need to log out of the system.

102 Steidle Building

There is no active work in this laboratory at this time – no actions necessary

105 Steidle Building

1 person occupancy limit – only one of the following will be required at any particular time

- SEM (5 min)
 - Bring sample chamber to atmosphere
 - Remove sample and close chamber
 - Turn off main power switch on power supply
- AFM (2 min)
 - Turn off unit at the controller
 - Perform data backup
- Leco hardness tester (2 min)
 - Remove sample from machine
 - Turn off power switch
 - Save data spreadsheet
- Mitutoyo hardness tester (2 min)
 - Remove sample from machine
 - Turn off power switch
 - Save data spreadsheet
- XRD (5 min)
 - Stop run and unload sample
 - Turn key to power down x-ray tube
 - Push power button to turn off machine

117 Steidle Building

2 person occupancy limit; unattended experiments may require someone to enter the lab for the purpose of powering down equipment in addition to those performing active experiments

- Viscometer – currently decommissioned
- Ball mill, vibratory mill – (1 min)
 - Turn off power
 - Remove mill jars and return to “home” laboratory space
- Sputter deposition tool (5 min)
 - Turn off all sources and source power supplies
 - Close gate valves to pumps and isolate with backing valve
 - Turn pumps off
 - Vent backing line
- Heated platen press (5 min)
 - Lower bottom platen to release pressure on sample
 - Leave sample on platen to cool
 - Turn off power
- Warm isostatic laminator (5 min)
 - Depressurize chamber
 - Raise sample piston and remove sample
 - Slide door closed and turn off power
- Tape casting machine (15 min)

- Turn off power to machine
- Clean doctor blade fixture
- Leave wet tape to dry
- 4 low temperature and 1 high temperature muffle furnaces (1 min)
 - Allow runs to go to completion
 - Samples can be retrieved at a later date
- Drying chambers – 1 large and 2 small (1 min)
 - If on, turn off power
- 2 load frames (15 min)
 - Short term tests (<5 min) may be run to completion
 - Otherwise, stop test
 - Remove sample, sample fixture, load cell and any additional fixturing from load cell
 - Save data file
 - Turn off load frame, controller and computer (order is listed on the equipment)
 - Return load cell and any fixturing to appropriate storage place

124 Steidle Building

1 person occupancy limit

- DMA, DSC, TGA/DSC (5 min)
 - Allow run to finish – equipment will go into power saver mode when experimental runs are finished
 - Close nitrogen gas cylinder valve
 - Samples can be retrieved at a later date

126 Steidle Building

1 person occupancy limit – only one of the following will be required at any particular time

- Hot mounting press (15 min)
 - Allow run to finish
 - Remove sample and clean up flashing and loose mounting material
- High speed saw (10 min)
 - Stop saw blade and turn off cooling water
 - Remove saw blade, sample/fixture plate
 - Clean machine as normally done when cutting is complete
- 2 low speed saws (5 min)
 - Stop saw blade
 - Remove saw blade, sample/fixture
 - Clean machine as normally done when cutting is complete
- Rockwell hardness tester (2 min)
 - Remove sample and indenter
 - Turn off power to tester
- Optical microscope (2 min)
 - Remove sample
 - Turn off microscope power and replace cover
- 2 manual grinding stations and 2 automatic polishing stations (10 min)

- Turn off wheels and water
- Remove and clean samples
- Remove grinding/polishing pads
- Clean equipment

128 Steidle Building

1 person occupancy limit – only one of the following will be required at any particular time

- 5 optical microscopes (2 min)
 - Remove sample
 - Turn off microscope power and replace cover
 - Save data on computer
 - Log off microscope computer
- TMA (5 min)
 - Allow run to finish – equipment will go into power saver mode when experimental runs are finished
 - Samples can be retrieved at a later date