

COVID-19: Protocols for conducting human research trials in Biomechanics

Institute for Health and Sport

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Introduction

This document outlines revised laboratory procedures to ensure a 'COVID-19 safer environment'. It applies to all laboratories where human research trials are conducted within the Institute for Health and Sport (IHES) at Victoria University (VU).

This includes Rooms FP.P139, 138, 141, FP.PB211, 214 and FP.PB301 within building P, Footscray Park Campus.

Current evidence suggests COVID-19 most commonly spreads from close contact with someone who is infectious. It can also spread from touching a surface that has recently been contaminated with respiratory droplets (cough or sneeze) of an infectious person and then touching your eyes, nose or mouth.

The most effective way to minimise the risk of infection with COVID-19 is complying with physical distancing requirements and encouraging staff and any visitors to maintain good hygiene and use of personal protective equipment.

Key Issues

Each research area within IHES has specific risks when returning to data collection in a COVID normal environment. The key issues in Biomechanics are infection mitigation control in a nonclinical setup, exposure to expiration from activities either intense or minor, exposure to perspiration and potentially contaminated items within the laboratory.

The following controls must be put in place before research trials commence to mitigate these risks and ensure a safe environment as far as reasonably practicable.

All Individuals requesting access to lab or campus facilities must have access approved before they can return attend on campus and utilise any facilitie.

Engineering Controls

Heating, Ventilating, and Air Conditioning (HVAC) system

Description of Current Procedure

Building P, HVAC recirculation dampers set to 75% when occupied.

Revised Procedure

There is currently no evidence that COVID-19 can spread through HVAC systems, although some concerns have been raised that this might be a possible contributor to spread of coronavirus. Given the nature of the activities performed in the laboratory and the increased production of expired air when exercising, as a precaution the following changes are recommended:

- 1. HVAC system to be set to 100% refresh rate (WHO reference URL here)
- 2. Recirculation dampers set to 'closed' or the amount of recirculated air is restricted as much as possible.
- 3. High-efficiency particulate air (HEPA) filtration or the highest MERV rating allowed by the HVAC system should be used to clean recirculated air.



- 4. Avoid setting climate control systems to low "cold" temperatures (below 21°C) (Chin et al., 2020) and "dry" low humidity settings (below 40%) as these are optimal conditions for the virus to survive (Chan et al., 2011; Van Doremalen et al., 2020).
- 5. Do not use indoor pedestal / overhead / box fans for air circulation (WHO reference URL here)



Ventilation

Description of Current Procedure

Normally activities within the biomechanics laboratory have the large external door (looking out onto the oval) closed to the public.

Revised Procedure

Under the constant supervision by staff conducting research activities and where possible with consideration the weather and type of activity being undertaken, the large biomechanics door can:

- 1. Remain open to improve ventilation for the duration of an activity
- Be opened periodically During breaks between activities (15 minutes), guided by WHO - '<u>Natural Ventilation for Infection Control in Health-Care Settings</u>' CDC - '<u>Guidelines for Environmental Infection Control in Health-Care Facilities (2003)</u>' Victorian DHHS '<u>Coronavirus (COVID-19) Infection prevention and control guideline</u>' Ver 5 26 Oct 2020
- 3. Opened post activity for 30 minutes to aid in ventilation exchange for before the next activity. (guided as above.)
- 4. The door should remain closed on days of ambient temperature over 36 Degrees Celsius.

Restriction of People in Laboratories

Description of current procedure

- All laboratory spaces are fob access only. Access is restricted to personnel that have completed inductions, relevant OHS or biosafety training.
- There are currently restrictions regarding the number of people in the laboratory.

Revised Procedure

Biomechanics is large, open space yet compartmentalised and is used for both Research and Teaching activities.

Only one research activity can be undertaken in the laboratory or where possible contained to lab sections closed off with drop nets or partitions to allow for teaching engagements. Where not possible only one activity may be conducted in the entire space irrespective of section.

The PB301 Biomechanics Lab is a very large space that is sectioned into five spaces with a dedicated control room. This allows for multiple activities within the lab and is run in this manner to allow maximum utilization of the spaces based on proposed activities.

Whilst social distancing is in effect, specific controls have been put in place to direct transit and maintain a minimum of 1.5m from all access points and paths within the laboratory.

Biomechanics can continue to function for research with consideration of the type of activities planned, space requirements and restrictions around movements.

Additional COVID-19 clean and awareness induction and training must be completed by all staff and students utilising the laboratory.



Prospective activities within the laboratory will be assessed on risk to allow for adequate planning and time for mitigation and control of COVID-19. This risk category (high or low) will determine the actions and or restrictions required to facilitate research safely. The minimum number of staff, supporting personnel and participants must be defined and approved by Technical Manager or nominee to accommodate special use case scenarios

Maximum number of people in the laboratory section during each trial:

a. Low risk exercise or activity:

Low intensity exercise or activity where respiration and perspiration is not expected to increase substantially. Based on unencumbered floor space where social distancing 4m2 and safe passage with free movement can be achieved each of the 5 lab sections and control room can have a capacity of: Lab A, Maximum capacity Section 1 (4 People). Section 2 (3 People) Lab B, Maximum Capacity 4 People Lab C, Maximum Capacity 3 People Lab D, Maximum Capacity 4 People Lab E, Maximum Capacity 4 People Control Room, maximum Capacity of 3 People. See Appendix C for more detail.

Example: Max 4 people of any researcher / participant ratio in lab sections, so long as there is a researcher to supervise.

Provisions for participant support personnel must be factored as an additional member if needed in the test environment (PPE Provided) or the support member can wait outside the lab in the P135, P130 common area or café or in the designated PB3C02 foyer area.

b. Low risk exercise or activity:

Moderate intensity exercise (where respiration and perspiration may be elevated minimally). Capacity up to one researcher and one participant in the laboratory / section. With one researcher / assistant outside the laboratory (control room) or on call ready to render assistance in case of an emergency.

 c. High risk exercise or activity: Intensity exercise with elevated expiration and perspiration. One researcher (in full PPE), one participant and or support for participant. One researcher / assistant outside the laboratory (control room) in full PPE or on call ready to render assistance in case of an emergency. Closed doors or barriers in place.

Administrative Controls For all Researchers and Participants

Prior to Study Commencement

 The researcher must submit a COVID safe (HSW-F-071) Job Safety Analysis risk assessment in addition to the required (HSW-F-002) OH&S activity based risk assessment and standard operating procedure (SOP) for their purposed activity to the technical manager for approval before data collection can begin.



- 2. The researcher must submit an online transition to campus form, which must be approved by the Technical Manager, Director of Research and Victoria University Research (VUR) before coming onto campus.
- 3. The researcher must complete the Department of Health's <u>COVID-19 infection control training</u> and send certificate to the Technical Manager https://www.health.gov.au/resources/apps-and-tools/covid-19-infection-control-training

Pre-Screening

- 1. The researcher must call the participant one day before the trial and ask them a number of questions to determine the risk of having COVID-19. Refer to Appendix A for screening questionnaire.
 - a. The trial must be rescheduled if the participant answers yes to any of the questions as this indicates a greater risk of having COVID-19.
 - b. Completed questionnaires confirming wellness must be made available to the Technical Manager.
- 2. On the day of the visit, the researcher must confirm that the participant's responses to the screening questionnaire have not changed and their body temperature does not exceed normal (37.2°C). [Adequate device for temperature measurements will be purchased.]
 - a. The trial must be rescheduled if responses have changed from the previous day or if their temperature exceeds 37.2 °C. (36 °C to 37 °C is defined as normal, above 37.2 is defined as a fever).

Temperatures mast be taken at rest after no strenuous activity or after sufficient rest from exertion in outside ambient conditions.

Failing a temperature test (above 37.2 °C) Technical Staff must be informed and the person will be provided a mask if not already wearing one, and moved to PB304 to rest.

After a sufficient rest period (15 min or more) and if testing again above 37.2 °C, they will be deemed to have a fever where COVID-19 Controls will take effect. Technical Staff must be informed.

- b. The trial can go ahead if the responses have not changed from the previous day, body temperature is normal, and the Technical Manager or representative has been informed of no change from the previous days responses.
- c. Screening questionnaires must made available on request on the day of the trial.
- 3. Researchers, or participants in research, who have COVID-19, who have symptoms of COVID-19, have been tested for COVID-19, or who have been in contact with a suspected or known case within 14 days, must stay home and must not be allowed access to VU. These researchers will be required to undergo a COVID-19 test and provide evidence of a negative result to their Institute and the Technical Manager. If the result is 'positive', researchers must follow government advice.

Attendance Register

Complete attendance register (including mobile number) via the VU Safe App or the Security Office on campus upon arrival and exit of laboratory. This is to assist with contact tracing in the event of a COVID-19 positive case.



Cleaning Checklist

Researchers must wipe down/clean all equipment, benches etc., with Viraclean or as directed by Technical Staff before and after use. Cleaning must be recorded on the cleaning checklist located in the laboratory (Appendix B).

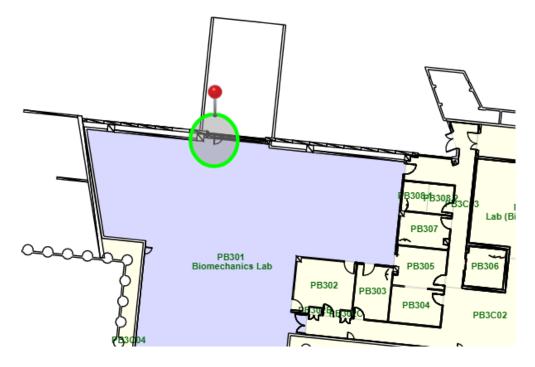
Not all equipment is chemically compatible, and each member involved in laboratory activities will need to be inducted with the COVID-19 clean and awareness induction.

Entering/Exiting the Building

To minimise unnecessary transit through campus grounds and Building P to level PB3 via narrow stairwells and elevators, primary entry and exit from the Biomechanics Laboratory can be achieved by two means from external access points then through the main lab doors thus avoiding transit through other areas of the building:

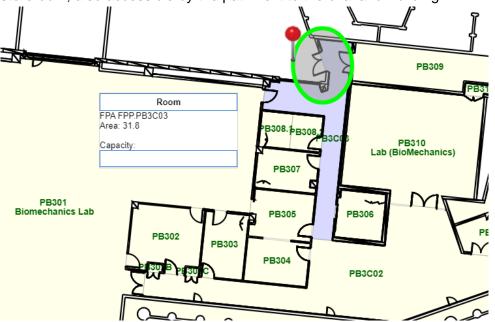
Below A & B. images show external access followed by main lab door access.

a. The Biomechanics Laboratory small door (inserted in the large bi-folding external lab door) accessed from the path next to the oval and Building P, aided by the researcher where protocol allows.

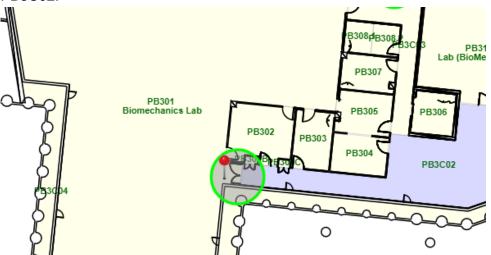




b. Building P corridor PB3C03, Level PB3 side entry/exit door opposite PB309 storeroom, also accessible by the path next to the oval and Building P.



Then entry and exit of the lab via the biomechanics main lab doors via corridor PB3C02.



Strict and achievable sanitation regimes will be employed at all ingress and egress, using Viraclean and wipes before and after each activity / participant



Entering/Exiting the Laboratory

Description of current procedure

Researchers wash or disinfect their hands when entering/exiting laboratories.

Revised Procedure

- Researchers and participants wash and or disinfect hands upon entering the lab then immediately put gloves on.
- On exiting the laboratory, researchers and participants will remove gloves (if wearing them) then disinfect hands.
- Anyone entering Victoria University campuses including associated laboratory facilities must wear a face mask. To prevent cross contamination, face masks used in laboratories cannot be the same as those used outside laboratories.
- Anyone entering the biomechanics & Motor learning laboratory facilities must wear gloves when undertaking research activities.
- Clear passage floor markings are in place and must be followed.

Before entering laboratories:

- 1. Disinfect hands using hand sanitiser.
- 2. Write your name on a zip lock bag provided using your own marker/pen.
- 3. Remove mask and store in zip lock bag. Seal bag.
- 4. Place zip lock bag in plastic container provided.
- 5. Disinfect hands again using hand sanitiser.
- 6. Put on a single use disposable mask provided.
- 7. Enter the laboratory.
- 8. Put on disposable gloves provided.

Exiting laboratories:

- 1. Remove mask by the straps and place in the yellow Biohazard bins provided.
- 2. Remove gloves by the rim then dispose of in the yellow Biohazard bins.
- 3. Disinfect hands using hand sanitiser
- 4. Exit laboratory
- 5. Disinfect hands using hand sanitiser.
- 6. Retrieve your own zip lock bag & put on your personal mask.
- 7. Take the zip lock bag with you or throw it out in Biohazard bin provided.



Common Laboratory Procedures

Passive Kinematic & Kinetic Data collection

Description of Current Procedure

The participant will usually be running or walking over force plates embedded in the floor or have 'video' cameras recording the movements during a sports task in various locations or on instrumented equipment.

Revised Procedure

- The biomechanics space can accommodate a large number of people however a minimum number of research staff are to be identified and approved through the Institute and Technical Staff prior to laboratory space booking and research approval, with the emphasis on minimum personnel at all times. Based on unencumbered floor space where social distancing 4m2 and safe passage with free movement can be achieved.
- 2. Clear role and task delineation of the research activity must be planned out and assigned by the researcher, to ensure there is control on cross contamination and unnecessary contact.
- 3. Risk of the planned activity must be assessed, characterised and minimised by the Technical Staff and researcher.
- 4. Researchers, visitors, assistants and participants must wear provided face masks at all times.Personal masks are permitted to be brought into the lab spaces. Participants are required to wear a mask unless they are undergoing an exercise task where a mask would impede that task, are medically exempt or is required to be removed in an emergency.
- 5. Where participants won't be wearing face masks (planned) or as a result on the day of testing, the researcher must communicate and inform the Technical Manager and the iHes for approval. All attempts to retain use of masks must be explored where possible.
- 6. Researchers, visitors and assistants will additionally wear gloves in the laboratory before commencement and throughout the planned activity. Participants can be provided gloves to wear at their own volition.
- 7. Data collection station, cameras and equipment will be set up prior and where possible, well away (min 4 m) from the activity being conducted.
- 8. Rest stations / locations where approved and appropriate will be made available in the laboratory for personal belongings and rest stops required during research protocols. Only participants can be present in any rest station and are permitted to handle any belongings. The rest station must be 8 m2 per participant as per DHHS requirements for indoor gym setting.
- 9. Researchers are to remain a minimum of 1.5 m from the participant and 4 m during activity, to facilitate clear communication, or where possible from the PB302 Control Room. Researchers will follow floor makings when moving throughout the lab spaces, follow directions from technical staff and plan test setup layout through their protocol and Risk assessments prior to approval.



- 10. Under active research the participant must have a minimum of 8 m2 of clear space per persons as per the requirements of DHHS on indoor gym settings.
- 11. A designated sanitation area / station is to be made available for the researcher for all used equipment to be to be placed at the end activities for sanitation under direction from Technical Staff. This does not include any personal apparel or gym equipment / towels.
- 12. PPE collection / sanitation station and clinical waste disposal bins will be available at entry and exit of the laboratory.
- 13. In addition to College COVID-19 JSA's and Laboratory activity-based risk assessments, the research undertaken must be classed as High intensity or Low intensity exercise.
 - a. High intensity exercise or activity during research will require
 - No more than one researcher in the test environment in full PPE outlined in *Active Kinematic & Kinetic Data collection*.
 - No more than three support staff either In the PB302 control room or unrestricted outside on call (trained and inducted members only).
 - Support staff will be required to wear all PPE (gowns, gloves, masks) when in the laboratory and test environment and must reside well outside the test environment (usually in a separate laboratory section) during active research high intensity efforts and only enter when cleared by the researcher conducting a trial and an adequate time period has elapsed, set by the researcher.
 - Only one support staff will be permitted in the laboratory space outside of the designated test area during active research.
 - Social distancing must be adhered and increased to a minimum of 2 m per person, even after rest.
 - The researcher must remain at least 4m from the participant at all times during active research, before closing to 2m after rest.
 - Research classified as high risk where social distancing rules may be compromised i.e. in environments of high exertion, expiration, and perspiration or high intensity treadmill running must be reviewed and approved with mitigation strategies in place. Technical Services and VUR must approve.
 - b. Low intensity exercise or activity during research will require.
 - No more than 4 people of any researcher / participant ratio in lab sections with supervision, see section 'Restriction of People in Laboratories '.Social distancing of 1.5 m from each other, and 4 m from participant at all times during low intensity activities until conclusion of participant rest where distancing closes to 1.5 m.
 - PPE (Gloves and Masks), or full PPE outlined in 'Active Kinematic & Kinetic Data collection' where social distancing may be compromised for marker placement or specialist setups during low intensity effort exercise or activities such as walking, jumping, catching or kicking.
 - Where the 1.5 m social distancing rule may be compromised the researcher must ensure the College and Technical Staff are aware and approve the activity. Where this distance may be compromised, full PPE (face shield,



goggles, masks, gowns and glove) must be used to comply with close contact guidelines and requirements.

14. Pedestal fans cannot be used during research, consideration of the type of exercise, exertion and duration etc. need to be assessed prior to beginning an activity, WHO recommendations [Coronavirus disease (COVID-19): Ventilation and air conditioning].



Personal Protective Equipment

Face mask Gloves Goggles (recommended)

Cleaning Procedures

Thoroughly clean any used bio bed's, massage tables, trollies, sealed bench tops, used plastic chairs and any touched equipment where directed with appropriate cleaners and as documented in general cleaning checklists.

Active Kinematic & Kinetic Data collection

Description of Current Procedure

The participant will usually be running or walking over force plates embedded in the floor and or have *'various motion capture systems'* recording the movements during a sports task in various locations or on instrumented equipment.

This includes marker placements on precise body positions or body suits.

Revised Procedure

- 1. With consideration of all points in *'Passive Kinematic Data collection'* the additional point below must be adhered to.
 - Where specialised marker placement, body suits or markings are required to be used on the participant, the researcher must be in full PPE if the 1.5m social distancing may be compromised. Full mandatorily PPE in close contact clinical environments include (gloves, mask, face shield, , lab gown).
- 2. Technical staff and the College must be informed and approve of close contact scenarios where the 1.5 m social distance rule may be compromised.

Personal Protective Equipment

Face Mask Face Shields Gloves Goggles Lab / Disposable gown

Cleaning Procedures

Thoroughly clean any used bio bed's, massage tables, trollies, sealed bench tops, used plastic chairs and any touched equipment where directed with appropriate cleaners and as documented in general cleaning checklists.

Laundering of apparel used for body suits (Contractor).

Disinfect markers/sensors or equipment that comes in contact with skin, sweat, saliva. (80% ethanol spray, or Viraclean as directed)



Appendix A:

COVID-19 Screening Assessment

Study: _____

Participant code: _____

Date:

Day prior to visit	Researcher/assessor:			
Contact				
Have you been in contact with a confirmed suspected (being tested) case within the p days?		□ Yes	🗖 No	If yes, date:
Have you been in contact with someone who has refrom overseas in the past 14 days?	Have you been in contact with someone who has returned from overseas in the past 14 days?		No No	If yes, date:
Travel				
Have you been on a cruise shi<i>p</i> in the last days?	t 14	Yes	No No	If yes, date:
Have you arrived from overseas in the last days?	t 14	Yes	No No	If yes, date:
Have you arrived from interstate in the las days?	t 14	Yes	No No	If yes, date:
Symptoms		,	,	
Do you feel unwell with any cold or flu like symptoms such as cough, sore throat, hea fatigue or body aches?		Yes	No No	If yes; describe:
Do you/have you felt feverish , had night sweats or had a high temperature recorded recently?		Yes	No No	If yes; describe:
Outcome				
Continue with participation/testing	Pause participation and reassess (date):			
Day of visit	Researcher/assessor:			
Contact				



Have there been any changes in contact with a confirmed or suspected case or overseas traveller since the previous assessment?	Tes Yes	No No	If yes; describe:
Symptoms			
Do you feel unwell with any cold or flu like symptoms such as cough, sore throat, headache, fatigue or body aches?	Yes	No No	If yes; describe:
Do you/have you felt feverish , had night sweats or had a high temperature recorded recently?	Yes	No No	If yes; describe:
Outcome			
Continue with participation/testing	e particip	ation and	d reassess (date):
NOTES:			



Appendix B:

FP.PB301 Lab Space & Activity Disinfection Checklist (General).

This checklist is not to be distributed. It is designed to aid Staff in the cleaning and safety of Laboratory & Teaching Facilities in compliance with current COVID-19 government and VU guidelines.

- Do not attend the job in case if you are experiencing symptoms like fever, running nose, flu, cough etc. 1.
- 2. Ensure 1.5 metre distance from others while performing the job.
- 3. All personnel performing the task must practice frequent hand washing and ensure not touching on face, nose and eyes.
- 4. Maintain good respiratory (cough and sneeze) etiquette i.e. covering mouth with tissue of inside of elbow. Dispose-off the tissue into waste bin.
- 5. Always start and finish the job with washing hands for a minimum of 30 seconds with soap and water.
- 6. Work through each item on the provided checklist.
- 7. When the check list is completed you must sign the cleaning log.

*Full PPE (Technical staff: Masks, Gloves, safety glasses and Gowns; Research staff: Gloves masks and safety glasses as in SDS) must be worn at all times during the cleaning of Teaching and Research facilities. Use clinical waste bins for disposable PPE on completion of cleaning / disinfection. Dispose of waste paper towel in general refuse bins.

PB.301 Lab Space, Pre & Post activity disinfection	DATE:
IDENTIFIED TASK	NOTES & COMMENTS
Disinfect all seating surfaces (plastic) chairs with Bleach or Viraclean solution using paper towel wipes wetted with solution.	DO NOT SPRAY ONTO SURFACE Allow to Dry.
Disinfect all used table tops with bleach or Viraclean solution.	• Bleach solution (0.1%) can be used on table tops
Disinfect all common touched surfaces (ie. light switches, handles, Doors, door handles, control surfaces) using 80% Ethanol or Viraclean using a paper towel wetted with solution.	DO NOT USE BLEACH DO NOT SPRAY ONTO SURFACE
Disinfect all equipment & control surfaces used during the activity.	Technical Staff to advise on material compatibility.
Ensure all disposable PPE are disposed of in the clinical waste bins as instructed at the end of the activity and or cleaning.	 Paper towels used for cleaning can be disposed of in general refuse
Disinfect all used Safety glasses / reusable PPE. Using Ethanol or bleach solution. And place on the previously disinfected Table Top or Designated area	 Technical Staff advice on material compatibility PETG Face shield use bleach solution Use detergent for heavy soiled items. Technical staff can collect from a designated area and disinfect PPE post event.
Disinfect Computer, Keyboards and Mouse using isopropanol alcohol based wipes or Paper towel dampened with 80% ethanol or Isopropanol Solution	 Cleaning on and around electrical equipment Turn off power source if possible before cleaning with liquids. Do not spray onto or around electrical equipment
Check supply of cleaner, disinfect and PPE used after cleaning. Request re-stock, refill of cleaner and PPE as necessary.	Disposable gloves, paper towel, hand sanitizer to be supplied by Tech Staff
Disinfect hands and any used stationary including the provided stationary with this checklist.	Must not be skipped
Disinfect the hand sanitizer and cleaner bottles used with 80% Ethanol or Viraclean.	Must not be skipped
Complete the Cleaning Log	Must not be skipped

Conditions:	Available Detergents and Disinfectants		
Full completion of this checklist	Viraclean		
 Twice daily before and after activity. 	Bleach 0.1% prepared daily		
• Additional Cleaning between users of a given or	• Ethanol 80%		
identified work station or specific roll within an activity (as instructed by TS)	 Isopropanol >70% 		
• Clean with appropriate PPE.			



Cleaning Logs: General Signoff (Cleaning and Disinfection).

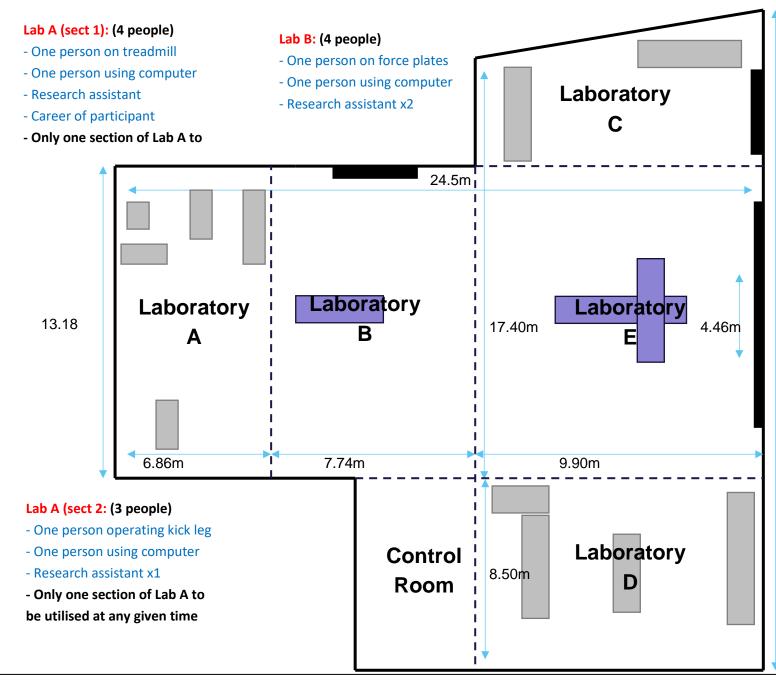
- *PPE must be worn during this cleaning activity.
- *Clean according to nominated schedule, using appropriate cleaner / disinfectant
- *Refer to associated checklist provided.

Common touched surfaces include ie. (Door Handles, Doors, Control Surfaces, Bench Tops, Table Tops, Chairs, Light Switches etc.)

Date	Time	Initials	Date	Time	Initials
DD/MM/YY	HH:MM am/pm	XYZ	DD/MM/YY	HH:MM am/pm	XYZ



Appendix C:



Equipment locations within the lab, some items are immovable due to the weight of the machine (i.e. >150kg)

Force plates imbedded in floor. One person per lab section to be jumping/ running/ walking

Lab C: (3 people)

- One person on Humac
- One person using computer
- Research assistant x1

28.38m

Lab E: (4 people)

- One person on force plates
- One person using computer
- Research assistant x2

Lab D: (4 people)

- One person on treadmill
- One person using computer
- Research assistant x2

Control Room: (3 people)

- Three people waiting as either research assistant, supervisor, parent/career of participant.

Teaching *(open lab)*: current markings in place to allow one participant on force plates /treadmill, one staff or student using computer, remaining students to stand in 2x2m marked space and enough distance for students to view projected screen for analysis. Lab B = 10, Lab C + E = 10, Lab D = 9.