



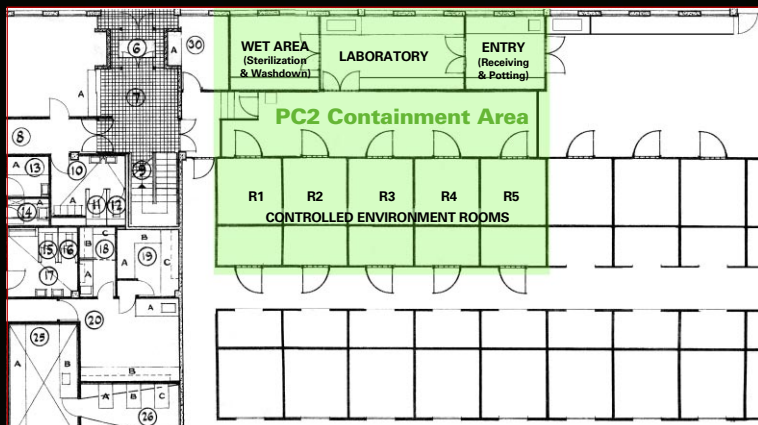
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Development of Physical Containment (PC2) at NZCEL

Controlled Environment Capabilities and features:

- **Capacity** - 5 rooms each measuring 3m x 3m x 3m
- **Temperature** - Automated control between 2 and 48 C, with flexible programming of diurnal range and time-series
- **Humidity** - Independent control of humidity with vapour pressure deficits from 0.2 to 2.0 kPa achievable, depending on temperature and canopy leaf area
- **Radiation and photoperiod** - Automated control of irradiance up to $1500 \mu\text{mol m}^{-2} \text{s}^{-1}$ and daylength, with a controlled variable lighting system allowing dawn/dusk simulation and variation in maximum radiation level
- **Spectral quality** - Simulated daylight and shadelight through control of the R:FR ratio with the option of speciality rigs such as UV-B lighting
- **Carbon dioxide** - Routine monitoring and control at ambient levels with enrichment capability up to at least 1000 ppm
- **Water and nutrient** - Automated delivery system with programmed duration and timing control
- **Hydroponics** - Hydroponic growing systems with the ability to control root temperature independently of air temperature
- **Growing media** - Soil, peat, sand, vermiculite, pumice, bark, or mixtures may be used, with a range of container sizes
- **Versatility** - Specialised operating parameters outside the standard range can be negotiated
- **Project management** - Full project management and support for clients



Laboratory features:

- **Biosecurity standard** - Structural standards according to AS/NZS 2243.3 1995 will be implemented and the containment facility will meet MAF Biosecurity Authority Standard 155.04.09, for new organisms of plant species, to plant house PC3 and PC2 level laboratory
- **Quarantine level** - Containment will accord with MAF Regulatory Authority Standard 155.04.01, up to level 3 Quarantine
- **Controlled access** - Entry and exit will be controlled by a card entry system with an anti-passback feature
- **Audit trail** - All material entering the PC2 area will be uniquely identified using barcode technology to maintain a complete audit trail
- **Automated data capture** - ADC technology will be available
- **Laboratory/harvest area** - A designated room for routine observation and measurement of experimental material with the appropriate equipment including leaf area meter, balance, microscope, fridge etc