The Base Building

4

4.1 An Instrument for Science

The new building should be as powerful an instrument for material research as the technical equipment being sourced for the School's new home. The architectural proposition for the building then commences by considering how it can best meet the needs of science and the scientists themselves.

4.2 The LAB Typology

Modular laboratory spaces
Few buildings – in particular laboratories – are ever finished. Adaptability is the key to future-proofing, and a key laboratory sustainability initiative - minimizing wasteful churn. Each lab module has a consistent servicing strategy including provision for tap-off points, and can be combined into multiple modules for larger continuous spaces.

24 lab modules, configured in 2 banks of 12 are provided on each upper floor. This is the longest feasible continuous module set possible without providing breaks for circulation and escape.

The modules are sized in bays of 3.6m widths - providing the best balance between ability to meet Australian Standards for clearances and an achievable modular width.

Service Corridor
The laboratories are placed in a back-to-back configuration, joined by a utility spine termed the Service Corridor.

Utility mains are routed in the Service Corridors, with a tap-off for each module installed initially, whether required or not, so that future modifications to each module can be accomplished without affecting utility service to adjacent spaces.

This allows installation or reconfiguration of key laboratory services with minimal interruption to laboratory operations, and servicing of mechanical and electrical systems without interrupting laboratory functions.

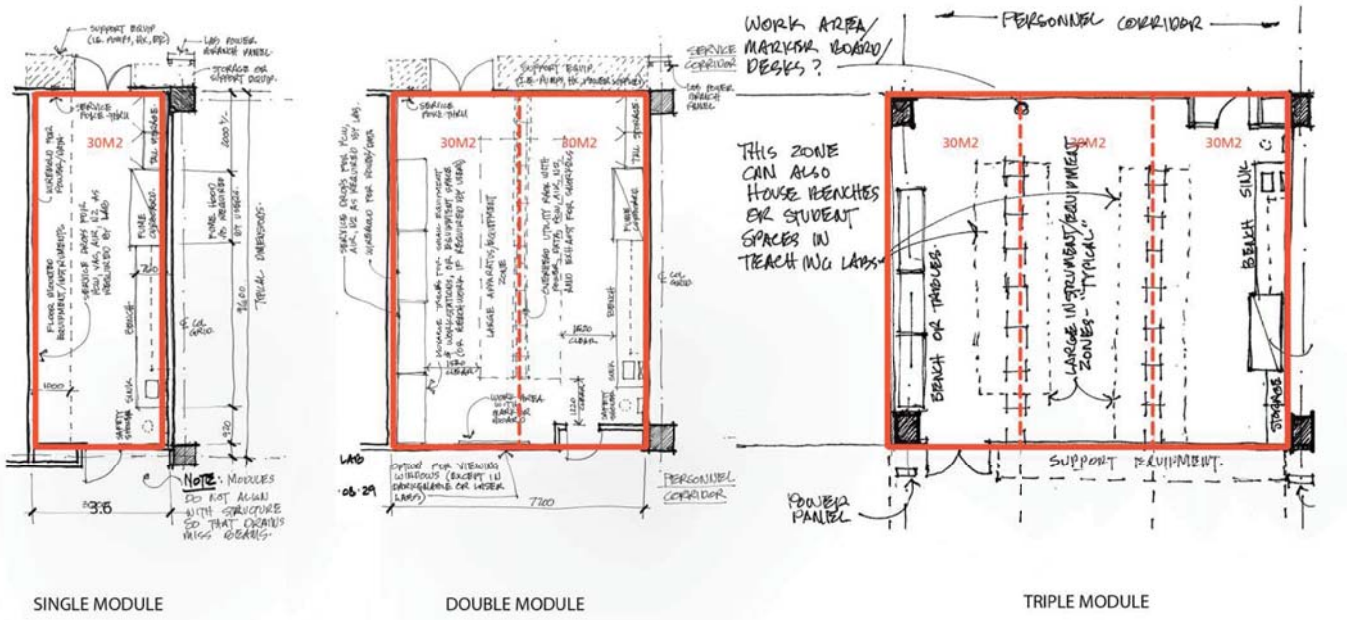


Figure 4.01 Lab Modules **Not To Scale**

Figure 4.02 Service corridor visualisation

Fume cupboard risers in each structural module minimise ducting cross-overs and provide greater flexibility in laboratory exhaust needs. Reconfiguration of fume or specialist exhausts can be done locally without interruption of adjacent laboratories.

Laboratory Core

The typical module is repeated out to the maximum practical length constrained by site and horizontal services lengths. The lab zone is then sandwiched by services risers, escape stairs and the goods lift.

This creates a maximised contiguous zone providing the highest possible degree of serviceability, in a rational, modular structure. This complete, independently functioning zone is termed the 'laboratory core'.

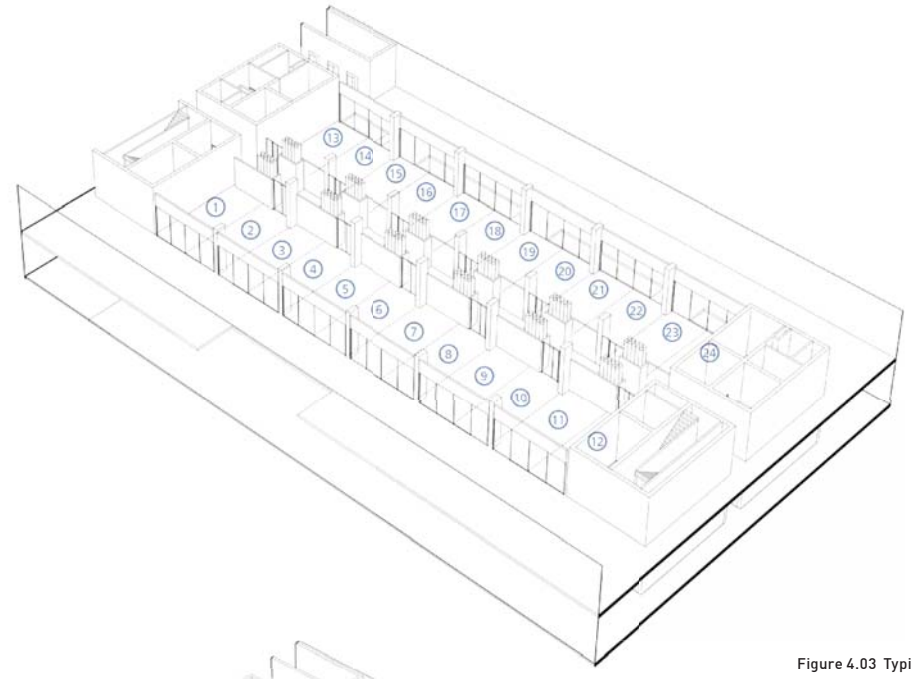


Figure 4.03 Typical division

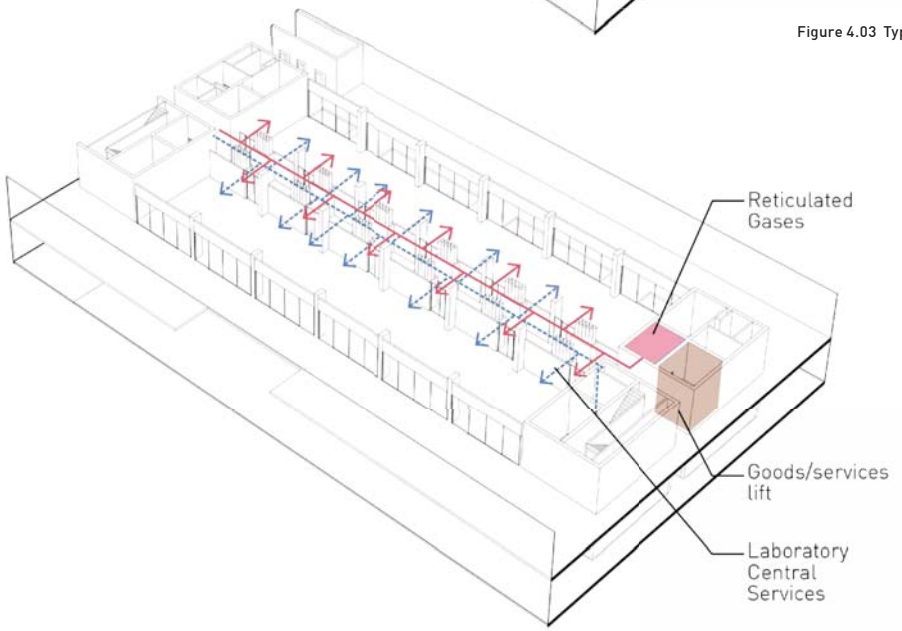


Figure 4.04 Typical laboratory core

4.3 The Breathing Workplace

The Core is enveloped by a habitable 'skin' containing offices, meeting rooms, and breakout spaces, providing an environmental cocoon for the laboratories – modulating temperature, direct light, and pressure.

The Skin allows for a direct adjacency between office zones and individual laboratories – important for casual monitoring of laboratories by senior staff and lab leaders often based in their offices for a majority of the time. This also serves to give the building a sense of occupation, and to help the reinforcement of team structures by allowing visual relationship among research team members and between their labs and offices.

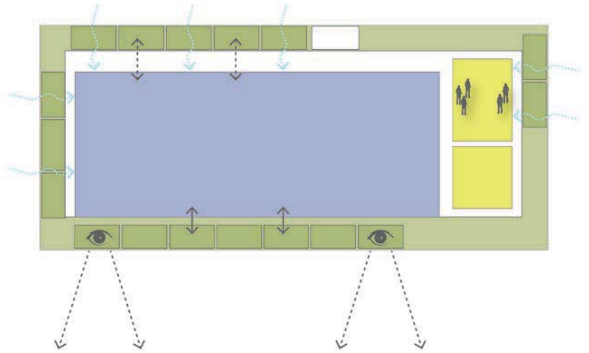
The wrap of office zone also creates an environmental buffer to the labs, making it easier to control light, temperature changes, heating and cooling loads in the highly serviced spaces.
The skin, whilst provided with conditioned air, is able to accommodate local and individual control over fresh air and temperature through operable windows in the façade.

Revealing the Science

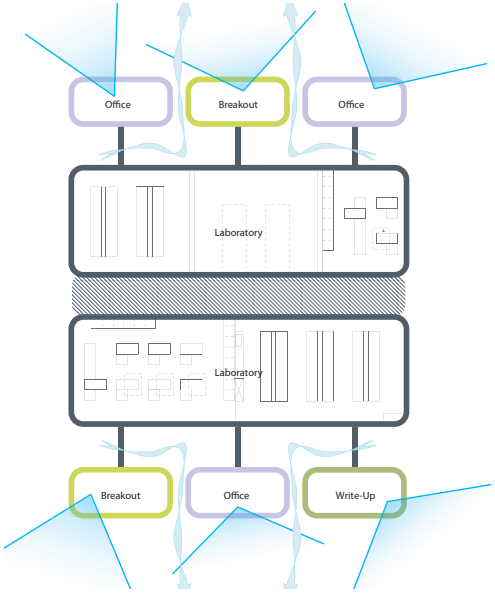
The office zone of the Skin is pulled slightly away from the laboratories core. This suddenly reveals the laboratories to adjacent floors, increasing the perception of connectivity through the lab groups, celebrating the science on display.

The office skin zone distinctly contrasts to the lab core – where the labs need to be hard, have clean surfaces, controlled lighting and environments, the office skin is warm, uses natural materials, allows individualisation of light and environment. Where the structure of the core is solid, heavy and robust, the skin is light, delicate and inviting.

Basic lab, office and hub structure



Environmental Qualities



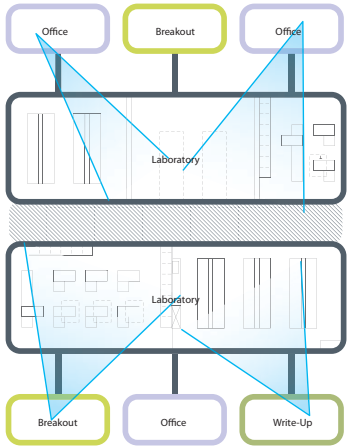


Figure 4.05 Floor plate analysis Not To Scale

4.4 Collaborative Tissue

Collaboration Strategy
Recognition of the strengths behind the success of the current School is important to understand what aspects of the building design can be harnessed to support greater collaboration between scientists. Application of generic approaches to 'office based' collaboration will not necessarily be successful in this case.

It is highly likely that large open plan 'collaborative' laboratories will not be feasible due to environmental control, noise, dust, and material contamination issues. Additionally, partnerships with industry may require separation for confidentiality reasons.

Collaboration is a simple thing at heart - born from communication. Obviously, interpersonal conversation and creating the potential for conversation, is a key aspect that building design can facilitate. Equally important but often overlooked is exposure of the science, working methods, and results through exhibit. Our design poses 4 key strategies that work to achieve these outcomes:

1. An Exhibition of Science
The laboratories are the heart of the reputation and prestige of the School and should form the basis of the character of the building. The laboratory spaces are presented throughout the building, exposing the scientists, work practices and equipment, but also maintaining an intimate relationship with the office and circulation zones. This will not be practical in all laboratories and the design as presented allows sufficient flexibility for those labs that require light control or cannot have exposed glass for safety reasons (i.e. laser laboratories).

2. Contiguous Laboratory Mesh – Horizontal and Vertical
All laboratory zones are linked by the internal service corridor and goods lift. This allows lab groups to collaborate informally on projects, sharing materials and samples through the service corridor zone, even though they may be spread across multiple floors.

3. A Meeting of Minds
The narrow office zone creates a concentrated spine of population, emphasizing proximity and accessibility. A distribution of pocket voids opens up visual connections between the floors and forms places for meeting and breakout immediately adjacent to offices and laboratories.

4. Common Ground
A ground floor café in the sunny North East corner provides an important focus to a common area in the building. Adjacent to the main entry and the central vertical circulation is a convergence point for the building occupants and the growing 'Science Precinct', it becomes a central informal meeting point for a cross-section of multidisciplinary researchers.

The ground floor also contains the High Bay Laboratories, opening visually to the North and South. They become part of the presentation of the Material Sciences School – a point of interest in a highly visible location – attracting comment and enquiry. Activity and the chance of spectacle helps drive a focus on the convergence point surrounding the building entry, reinforcing it as a hub of chance and arranged meeting.

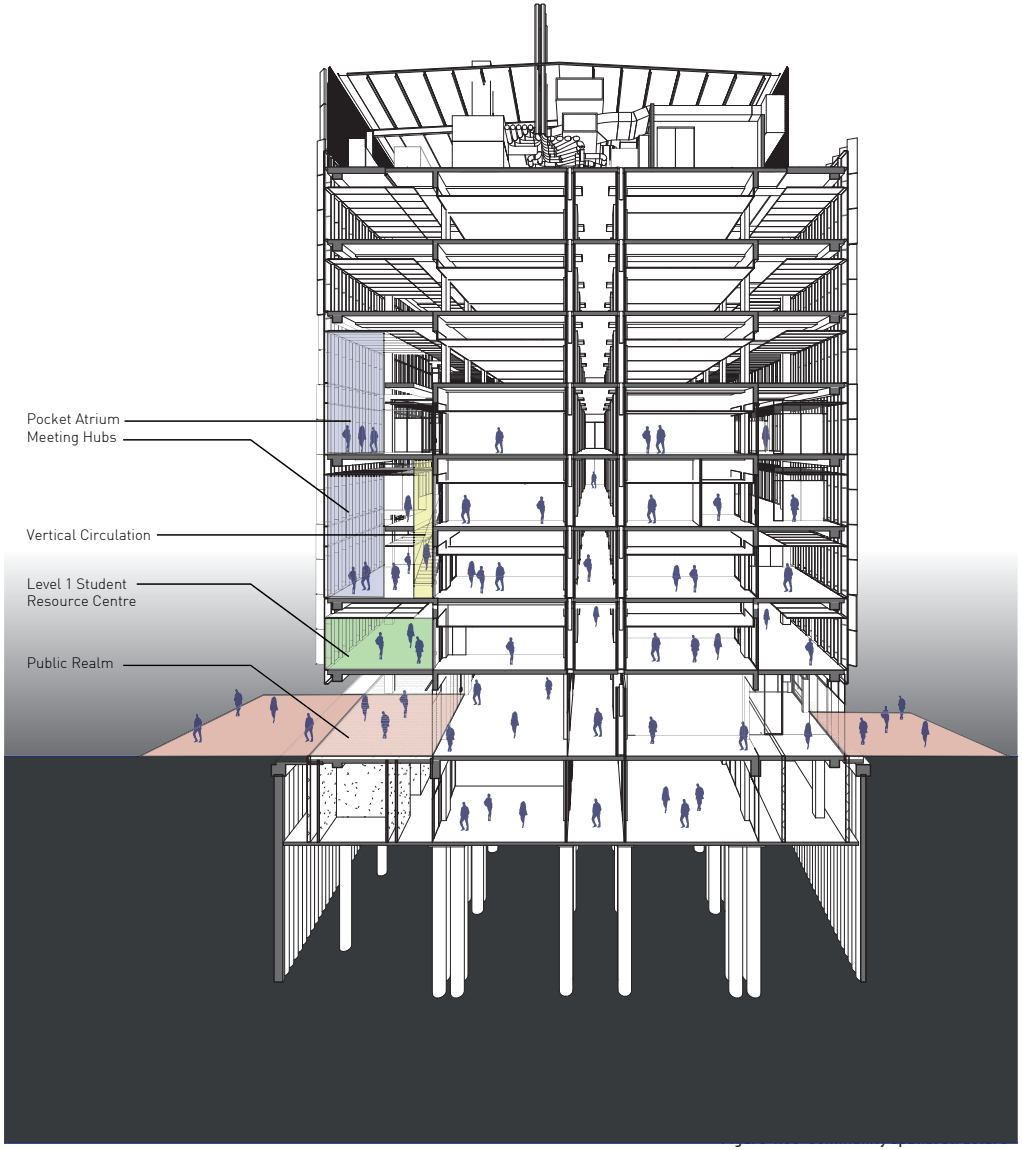


Figure 4.06 Collaborative Tissue

4.5 Connected Neighbourhoods

Vertical Neighbourhoods
Spaces for chance and arranged meeting are also clustered through the height of the building. Through use of interlocking voids suggesting vertical circulation patterns and boundaries, the building is arranged into a number of neighbourhoods stacked vertically along the northern edge. The Central lift zone, with its interconnecting stairs – forms a central bump space that treads all levels of the building.

The first Neighbourhood encompasses the entry, Undergraduate Teaching spaces, and Common Laboratory facilities on Level Ground, Level 1. A generous stair connects these levels, encouraging walkable access.

The Second Neighbourhood establishes the core research groups in levels 2,3, 4 and 5. The soul of this neighbourhood is the floor of the interconnecting atrium extending upward from Level 2. This informal meeting area will be provided with casual seating, access to networking and marker boards to encourage informal use by research teams.

The final neighbourhood demarks the additional levels in the building for a future purpose.

Post Graduate Cluster
A vertical interconnected cluster for post-graduates occurs on the western edge of the building, overlooking the University Mall. The cluster includes office space, meeting areas and common lounge

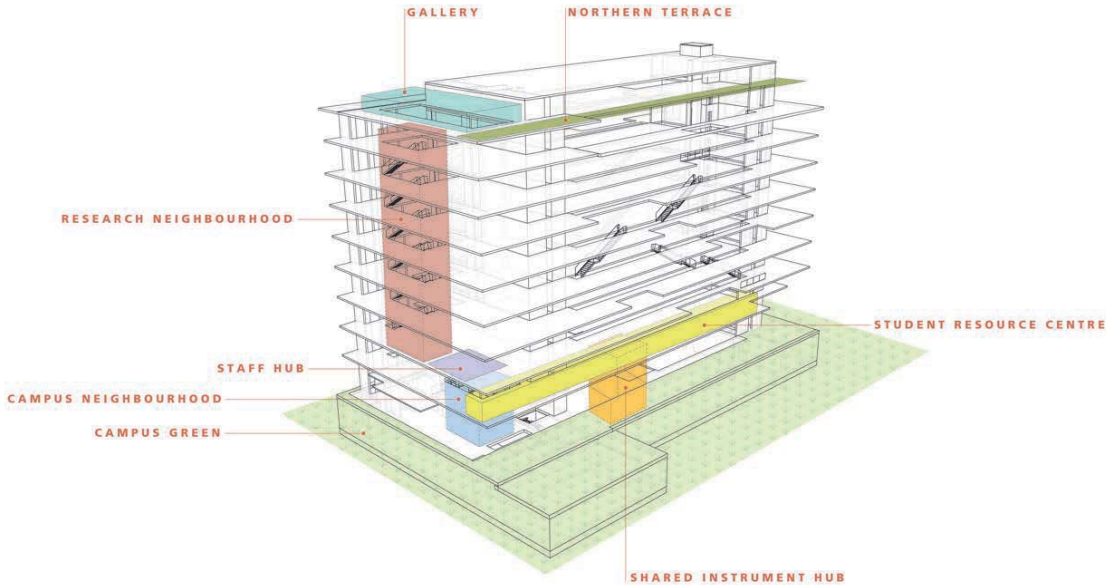


Figure 4.07 Neighbourhood locations
Concept only

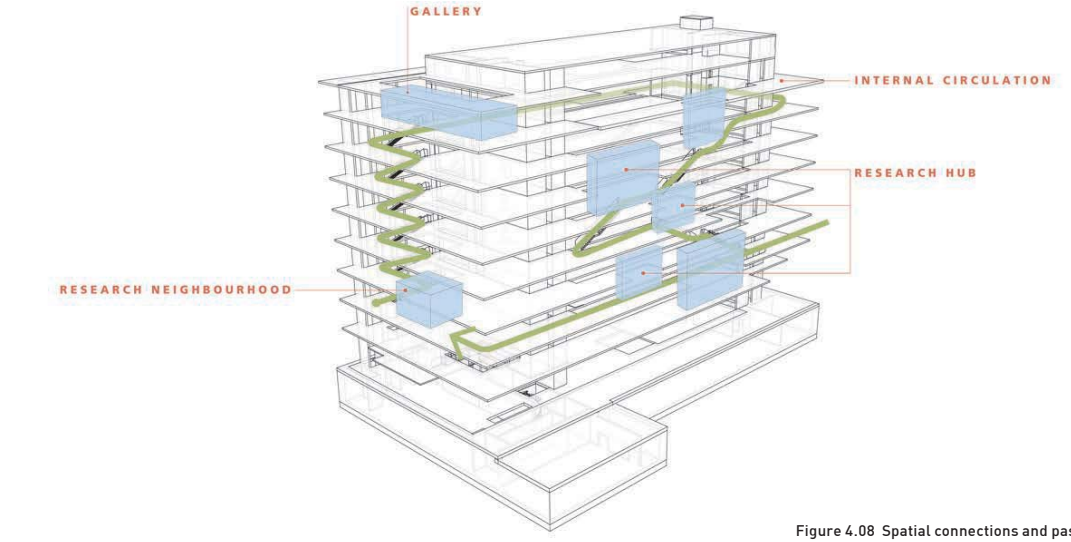


Figure 4.08 Spatial connections and passage
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