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UQ 5th Year Design Studio
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'City Life' Project, Milan, Italy

TUTORIAL #2: DESIGN PROCESS AND APPLICATIONS

OVERVIEW

The architectural design process is one that requires a range of mental templates in order to effect connection with a range of design influences in order to articulate the right outcome. There is an initial gestation phase which is highly personalised and is often more of a personal journey for the architect than one of rational or logical activity. That being said, the architect must be able to articulate her or his ideas about the building, brief, technique, form and articulation in a way that is clear and rational to clients and other interested parties, as well as in a way that correctly interprets technical and logistical requirements of the design.

RELATIONSHIP TO THE MASTERPLANNING PHASE

An important aspect of this design studio is the completion of a masterplan for the site and the selection and subsequent design of one or a group of buildings from the masterplan. The design work in this part of the course must therefore be able to articulate the relationship between the masterplan objectives and the final built form of the individual design proposal. Ideally, for the selected site the masterplan has articulated:

- Block size and example building footprint on the site
- Height, volume and setback limitations
- Site yield and plot density requirements
- Daylight access strategy and design requirements
- Open space requirements
- Cross Site linkages and Entry points
- Nodes or Gateways as part of the masterplan strategy
- Location for vehicular crossovers
- Outline design intent or story

As part of this studio it is also important to consider the final building proposition in its context, so some thought will need to be given to the height, scale, position and function of the buildings immediately surrounding the selected site, and the way in which they relate to your design proposal.

BRIEF FORMATION PHASE

At the outset of any design process a clear brief must be established. This Brief will usually be provided by the Client although in many cases, the architect may draft a return brief on behalf of the Client in order to articulate the design requirements before the design process is commenced. The brief needs to describe the functional requirements of the project, particularly the spaces that are required and they way in which these spaces are required to inter-relate.

This brief therefore should also include correct notation and understanding of either or both precedent buildings, and reference to design literature investigating the various aspects of the relevant building type in terms of functional requirement and logistical issues that relate to the building design. A good reference for the latter is Nueferts and I recommend you buy a copy and have it close to hand when designing. For the former, it is possible to identify a range of similar building types to investigate the way in which these works.

For non-typical or innovative building types, this research phase is quite important in terms of building up a clear understanding of how the selected building type actually works, before commencing design work.

IDENTIFICATION OF RELEVANT PRECEDENT

Precedent research should investigate for contemporary buildings of similar typology that are successful in terms of the design quality achieved as well as the way in which they function. Therefore these precedent references are a useful guide for understanding the opportunity for architectural expression and functional arrangement for the selected building type.

It is useful to obtain plan and section drawings of the relevant precedent in order to correctly interpret design issues such as the size and type of rooms required and how these inter relate, typical structure arrangements, floor to floor heights, extents of glazing, etc. An in depth investigation of precedent in terms of the design and functional opportunity is invaluable to the design phase.

SITE ANALYSIS PHASE

As per the masterplanning process it is necessary to provide an analysis of the project site under the following headings:

- Site Boundary and any relevant Easements
- Topography or Levels
- Height controls and Setbacks
- Site Cover and Open Space Requirements
- Pedestrian Arrival and Departure and Cross Site Links
- Views to, from and within the Site
- Existing Landscape or Topography Features including protected Vegetation
- Existing Infrastructure Networks and Requirements
- Vehicle Arrival and Departure by Type and Function (Car, Refuse Truck, Deliveries – Bump in and Out)
- Solar Path analysis
- Winds Analysis
- Noise source issues
- Open space networks surrounding the Site
- Waterways
- Geological Constraints
- Fire Risk or Hazard

The output of this analysis process should be a site constraints plan, a single drawing that summarises all constraints to relate to the design of the building/s. This site analysis should be updated through the design process.

FUNCTIONAL RELATIONSHIPS

This phase of design is particularly relevant when there is a highly technical building type, such as an institutional or cultural building, hospital or defence project. Commercial (office) building shell design and Residential Buildings are more straightforward and it is possible for these typologies to move straight to the next phase.

For this phase, it is necessary to understand the key functional groupings of spaces under the brief, and the way in which these will be required to interrelate by the design. It is important to also interpret what represents front of house (public) and back of house (controlled) functionality for the project type. A PARTI diagram can document this understanding. It is not a plan, nor a section, more a set of zones and interconnections that demonstrate the key functional relationships. The eventual plan might look very different and provide the same function across many levels.

Most buildings of a complex nature are horizontally programmed, in that they are usually low to medium rise with large floor plates and many functions across each level. This reduces reliance on vertical travel which is often problematic for a Client. In some cases however, it is possible to interpret buildings as being vertically programmed. This often occurs for fitout projects for large tenants in office buildings, who need to interpret their corporate structure into the vertical format of the office tower. In this case the PARTI diagram might be interpreted more as a section than a plan.

SITE ZONING

Once the key functional relationships are understood and articulated, it is then possible to look at the site analysis and identify key zones or locations for the major functional groupings on the site, in a way that maximises the design opportunity and utility of the design strategy being proposed. For example: For a Theatre Project, these have high requirement for loading in and out for large articulated lorries. Therefore the loading bay position, and hence the back of house, stage and ultimately orientation of the main theatre spaces, needs to carefully consider the way in which these vehicles will arrive at the site and then form the most efficient, safe and workable arrangement for the loading function. This analysis could be interpreted as a series of bubble diagrams by floor, to be interpreted horizontally and vertically.

Key locations of public address or view of the building, might also influence where certain functions are located, or how main front of house facilities are configured. This might relate to a particular view available from the site, a key frontage or point of arrival, or some other feature that is of heightened importance to the public realm.

MATERIALITY AND ASSEMBLY

Often this part of the process is left until after the design concept is formulated. However, any design concept needs to correctly interpret its materiality and method for construction in order to be able to be built. A developed understanding of key materials and building systems, as well as key fabricator and builder construction processes, will help identify the relevant materials and assembly techniques for the project.

Research on precedent as identified above is also very helpful to understand how various materials are assembled to certain design outcomes. Having an understanding of these processes while designing is important to the quality of the final built product. Understanding the materials and assembly at the start of the design process improves the ability for the design and later documentation teams to consolidate these early ideas into projects with a high level of technical resolution. Most high quality architects have a developed and established palette that, when combined with creative design thinking, ensures the final building output is of a high quality.

God is in the Details

Mies Van De Rohe

DESIGN CONCEPTUALISATION

This part of the process is as unique to architecture as there are as many architects. For me if there is one common thread between all of us, design is a story that we tell that relates the idea of the building to its client, community and context. It can be told subconsciously, by a building that is beautiful in itself, or as a consequence of the craft of construction technique and particular materials selected for the project, or some interpretation of the building brief, context or function as might be relevant to its design. We might have the opportunity to convey these ideas to a limited range of people involved in the procurement of the building, but we probably won't be able to convey this thinking to the wider group of people who will use the building. So ultimately it is about the story that the building tells itself, the way in which its internal and peripheral spaces are experienced, any referent imagery or form suggested or interpreted by the design, its civic and public quality, and generally how good or otherwise it feels to be in the spaces it creates.

So we as educators are not so much here to advise you of your story for creating buildings, the wonderful thing about architecture is that this story is ultimately up to you. The true test of the building as a design is how well it functions, and how much it is appreciated.

Perhaps one thought I would like to convey on this subject is that there are a complex range of psychological influences that act within us while we are on this journey of design. These are not always literal or didactic, and can be visual in 'the mind's eye', sensory or perceptual without having any immediately clear reason why we think or see these things. I think this is the process of lateralisation that goes on when we engage our creative energies. Perhaps as auteurs of an artistic and ultimately unexplainable output, it will never be perfectly clear from where our ideas are drawn or even what is their logical basis. In this way we do have the trust of the public and perhaps our imaginings can also take in a their imaginings as well. For this reason I think listening and observing from a range of sources, much like an author, in formulating our ideas or just feeding our creative sides, is important to the architect. I personally enjoy travel to ancient religious sites, I'm not religious in terms of belief in scripture but I appreciate their monumentality and to me it is made even more impressive by the relative remoteness of the artefact.

The Important of Visual Communication

At this nascent phase we will need some way of drawing the idea out of our head and putting it into some form that can be shown to some one else as a starting point for discussion. At this stage the type of tool we use to extract the ideas from our brains, is important to consider. The tool needs to quickly and easily interpret ideas (usually spatially composed) into a recognisable form eg. Hand drawing or CAD model). A pencil is easy to manipulate and directly links to the brain neural network. I have never been able to establish an equivalent intuitive feel with the computer, but I wonder if newer generations, with access to better designed interaction platforms, might be able to improve this intuitive connection with the computer, as it is an incredible device for improving the way in which our ideas can be translated and conveyed and ultimately, built. Again as educators we are not proscriptive about the tools that you use in your process of conceptualisation, but rather, that they work and are effective. Visual communication, the ability to quickly articulate and explain ideas, is a very important and I think specialised skill for the design architect.

For me as my understanding of materials, building processes and assembly techniques has improved; my ability to clearly visualise and articulate the building idea is becoming more straightforward. I do think it's important at the very early, concept design stage, to think about and consider the materiality and assembly. However I do miss those nascent days when I didn't really understand something all that well and had to rely on my intuitive response. I feel I've become a little standardised or commoditised now as a designer and I'm keen to return to those earlier, more intuitive days. For me, it's about the story we are trying to tell with the design, which is at least for me the way in which we relate to our natural environment, and ways in which we can improve and develop social justice, equity and transparency of process, within existing efficiency constraints.

PROGRAMME AND STRUCTURE

Programme and Structure or Form are closely interrelated. In fact, they are one and the same. Programme (what spaces are used and the way in which they interrelate) is the same as structure in that structure must perfectly coordinate to the function of the space. There is a wonderful thing in design when the design idea correctly interprets an efficiency of structure. This same efficiency is found in nature and this is why I would credit it as something we immediately recognise. Efficiency is inherently programmed to each of us.

The structure idea underpins the form idea. Sometimes, the form exceeds and drives the structure idea. But in this case, the programme, or the function of the spaces within the form, still needs to be perfectly coordinated with the form. This close interlinking between the visual expression of buildings, and their assembly, has resulted as a consequence of the drive for efficiency in building techniques.

Form follows function
Corbusier

Ultimately we need to be able to explain our approach, however we tell it, in a way that makes sense and is relatable. We also have the option to let the building speak for itself. I think it's important to know what to talk about, and what to leave open to the observer.

DESIGN INPUTS

Thankfully for design there are a range of inputs to the design process that will help the push for workable solutions. Possibly not beautiful ones, but that is where we the architects need to moderate the inputs to the design to ensure these consolidate the design approach. TO explain this, firstly there are a range of consultants that will have input to the design process along the way, or whom you might like to consult about certain issues in order to make sure the design thinking incorporates the technical or functional requirement of the object. That is not to say it drives the design, but rather it informs the design.

Consultants involved with the design process are as follows:

Consultant	Design Input
Town Planner	Interpretation of Planning Constraints
Quantity Surveyor	Price advice on building systems and materials
Project Manager	Client requirements
Structure Engineer	Design collaboration on structure design and requirements
Mechanical Engineer	Design collaboration on air conditioning and air handling
Electrical Engineer	Design collaboration on network infrastructure, power infrastructure, lighting strategies
Hydraulic Engineer	Design collaboration on water (roof drainage, storage, potable, grey), sewer, gas supply and return
Fire Services Engineer	Fire suppression systems and strategies, advice on fire brigade access requirements
Fire Engineer	Specific Fire Engineered outcomes against BCA requirements, advice on fire brigade access requirements
Certifier	Advice against compliance requirements of BCA
Traffic Engineer	Advice on movement requirements for any vehicle using the site, configuration of supporting infrastructure
Civil Engineer	Advice for overland flow and stormwater drainage, connection points for mains supply, advice on excavation or land forming requirements
Landscape	Function, Design and Materiality for outdoor spaces
Interior	Function, Design and Materiality for internal spaces, separate to Shell and Core design
Arborist	Tree protection requirements and strategies
Acoustics	Design advice for any specific acoustic issues
Communications	Opportunities for intelligent buildings, node locations in the plan
Logistics	Waste, Deliveries, Storage
Sustainability	Sustainability systems and compliance

For the purpose of this Studio, there is no opportunity to contact with these consultants, but the above scope gives an indication of the range of issues that should be considered as part of the design process.

DESIGN PROCESS - PLAN

The plan articulates the programmatic intent of the project. It must be very clear and immediately convey the way in which the various functions on that floor operate together. It should also clearly convey the way in which the form or structure of the building inter relates to the programme. The plan must make evident the seamless integration of the functional requirement, with the form or structure.

The plan should be laid out, very early in the process, and used to track and progress the design. Work on parts or all of the plan can occur concurrently in section or 3 dimensions, but the plan can be kept up to date with accepted approaches, in order to track development of the concept. Iterations of the plan revision can be catalogued to give a history of the development of the design of the project.

As above siting of the project and its key functions on the site are key to the projects success. In many ways the quality of this logic will depend on the logic implied by your Masterplan, but will not necessarily be constrained by it as it is possible to change and amend the building design to suit requirements of the design as it develops, and supercede the masterplan in this way. The masterplan is only a broad strategic review of a large set of sites before looking closely in detail at each part. There would be an ongoing role of the masterplanner to check integration of the various sites around site wide issues, however in this case we are focussing only on our selected sites.

The plan needs to describe all the major spaces as is relevant to the function of the selected building type. These should show the inclusion of all relevant fixed items if these are required for the functionality of the space (for example, a swimming centre should show all pools, or a theatre should show the proposed configuration of seating). It might not be necessary to show every room as per a fully developed design, however it is necessary to show the key functional zoning s in the right configuration for their functional requirements. For example, a theatre building has a significant number of back of house and support spaces, all of which could be described by their main functional grouping.

DESIGN PROCESS – SECTION

The Section articulates the vertical programme of the project and also the way it relates to structure and form. It also demonstrates the way in which key spaces or zones of the building inter relate in the vertical format. The section demonstrates the way in which daylight enters the building and any particular sustainability features of the design. The section demonstrates the way programme, structure and function of the building envelope, are seamlessly integrated.

Sections can be used to give a sense of scale and enclosure to a major space or set of spaces. These should show the scale of the drawing, relative floor levels of each major floor, and are best aligned where there is the most information about how changes in level are made ie at stairs or escalators. For example, a section through the major internal void of a retail centre can show immediately how this space is intended to work.

Sections can also show key functionality provision and the way in which this relates to the massing or external appearance of the building. For example, for theatre projects, large flytowers are required for the quick and easy removal of stage sets, these stand quite tall above the main body of the theatre so a section through this component would give a good indication of the way in which this issue has been addressed by the design.

FAÇADE STUDIES

Building facades are very important to the appearance of the building but also have complex technical requirements for their performance. The way in which the expression of the façade, inter relates to its function, is best expressed by large scale, detail elevation and section.

The way in which the façade or outer envelope of the building relates to the ground plane is also best expressed in large scale section. Façade studies can also be done as small models or maquettes and constructed out of simple planar materials, to provide an indication of the desired intent for articulation of the façade and any performance features.

Including the peripheral zone of the building to the section (say, the footpath surrounding the building, or any landscape treatments that connect), and the way in which the ground levels meet the building, is a key part of building design. If there are activated edges, such as shopfronts or areas of internal / external interface, these can also be explained through the large section.

LANDSCAPE HARDSCAPE DESIGN

The way in which various external pavements and surfaces are articulated is very important for the overall function of those spaces. Therefore detail studies of key external spaces, in terms of level and material, will convey the design intent for the public domain surrounding or integrated to the building. There may be a consistent streetscape patter that is adopted, or key outdoor spaces might be articulated to allow for functions or events. The paving pattern and levels will convey this functionality.

Planting strategies can also be articulated in these studies by way of zoning for planting heights, rather than select for species of plants.

DIAGRAMS

Simplified axonometric or plan views of the project can be overlaid with graphic lines or hatches, to convey the functional arrangement with regards to a particular issue; for example with a hospital project there are a wide range of travel paths through the facility that must be considered and demonstrated at the design submission stage. These can include patient and staff movement routes, routes for clean and dirty items and infection control, staff or security protocols and controls.

Diagrams can also be overlaid to building sections to quickly demonstrate various ideas such as people movement as above or perhaps air movement, solar angles or structure concepts. Diagrams are a powerful way to convey the key ideas or strategies of the project, to the Client or User, at key stages of the evolution of an idea or design.

DESIGN PROCESS - DELIVERABLES

Deliverables as part of the Building Design phase for this Studio are outlined in the Unit Synopsis. We have left this scope reasonably flexible given your seniority within the University System and our understanding that you will know how and what you would like to present. We can work with you through the course of the semester to determine the appropriate deliverables and scope for your final presentation.

PRESENTATION

One important issue to remember is to be prepared for the presentation. It is always worth building your story in a document as you approach the crit. Keep it updated and current. At worst, make sure you do a 'brain dump' in the hour before the crit. Just jot down the 4 or 5 main points that you want to discuss before the presentation, think it through a little on each one before the talk, and discuss only those key ideas in the presentation. If you 'wing' it a bit on the dialogue others ideas or issues will come up but these will arise as a consequence of discussion around the main idea or the one you formally introduced, so we as a group will understand how the more detail ideas interlink at the major idea level. This helps make clear how the scheme is brought together.

Its very important to make good use of the ten minutes for the presentation, so ideally it is well prepared or you at least have a way of keeping track of time while you are talking. It's not possible to explain everything so we need to step through your process, hear the important milestones and issues in very quick, concise order. Presenting is its own skill; it is tricky trying to present such a wealth of information in a constrained time frame.

Be aware of who your audience are, what are they listening for. What is their particular concern? What are their most important issues and messages that they would like to hear? Try to avoid overly complicated explanations as these take time and usually don't help make the scheme clearer, rather these can muddy the waters. It is better to say less than more. Drawings, sketches and diagrams should be used to convey the key ideas and ultimately are closely aligned to the verbal presentation at the end of the process. These really should stand-alone and not require additional explanation to make sense. We will have time to review the boards in detail later; in the crits we are focussed on hearing what you want to say to us that is not necessarily on the boards.

The boards should provide a clear, simple description of the scheme and its development from concept to submission. Ultimately we should not have to explain the design or the ideas behind the design. Most presentations and discussions about our designs occur when we are not there to present. The process of critique and review is relatively similar in the working environment, except that your Tutor is the Client, and the Client will discuss the design with a range of interested parties before providing feedback. So it is very important for the presentation boards, and any supplementary reports, to be complete in terms of the design proposition. At the least, this takes the pressure off at the presentation stage, where you can focus on building your relationships with the people you are presenting to, rather than trying to convey every part of the design intent.

<http://www.shnc.org/index.php>

The Surry Hills Neighbourhood Centre main office is located on the first floor in the new Surry Hills Library and Community Centre at 405 Crown St. Designed for sustainability Surry Hills Library and Community building has been recognized as a bench mark in public buildings and has won many awards. We work closely with City of Sydney Council (CoS) to maintain the premises to a high standard and ensure the service delivered by the Neighbourhood Centre to the community matches the ideal.

We are proud custodians of this community building and work hard to ensure the community has access to all the facilities. We remain grateful to City of Sydney for its generous support in providing the community and SHNC with this delightful building.

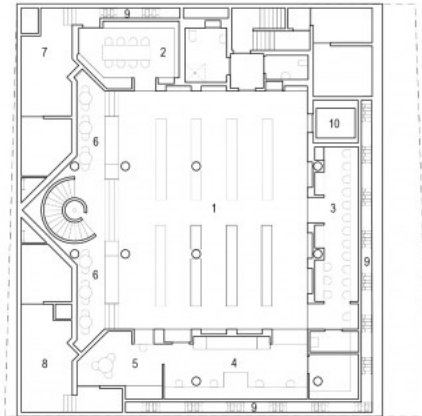
What does the SHNC do?

- *We offer a positive, modern and state of the art community space to the Surry Hills Neighbourhood*
- *Provide a space which is both welcoming and comfortable*
- *The Surry Hills Neighbourhood Centre works alongside the community in developing programmes and services that reflect the needs and wants that are specific to the Surry Hills Community*
- *The Surry Hill Neighbourhood Centre provides interesting, useful, social and fun activities and services for the community*
- *Surry Hills Neighbourhood Centre use a variety of methods in our activities, such as, photography, cooking, arts and outings*
- *Listen and value the Surry Hills community through using feedback in our planning for the future*
- *Build relationships and work with key organizations and local business's in the Surry Hills area to assist us in running services to the best of our ability*
- *A drop in facility that provides relevant information and through which referrals can be made*
- *Host cultural events such as the Surry Hills Festival and the Surry Hills Markets*
- *Work with, train and support volunteers in contributing in a variety of ways in the Surry Hills neighbourhood centre*

PLANS

LEGEND

- 1 LIBRARY COLLECTION
- 2 LOCAL HISTORY STUDY ROOM
- 3 IT AND INTERNET ACCESS PUBLIC COMPUTER LABORATORY
- 4 LIBRARY ADMINISTRATION
- 5 MEETING ROOM
- 6 MAGAZINE AND NEWSPAPER READING
- 7 WATER RECYCLING PLANT
- 8 GEOTHERMAL BORE PLANT
- 9 THERMAL LABYRINTH
- 10 LIFT

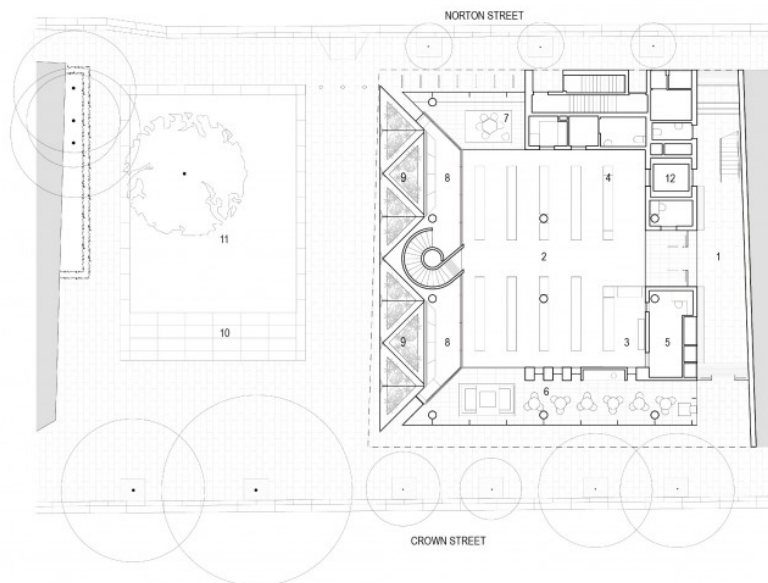


LOWER GROUND FLOOR



LEGEND

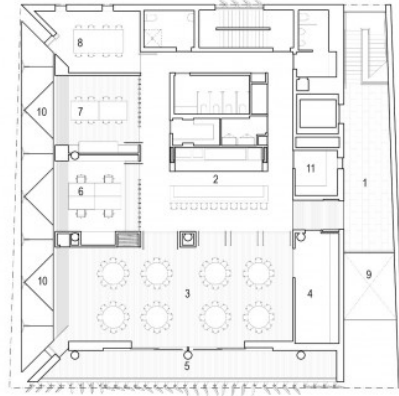
- 1 SHARED ENTRY LOBBY
- 2 LIBRARY COLLECTION
- 3 LOANS DESK
- 4 CATALOGUE COUNTER
- 5 LIBRARY ADMINISTRATION
- 6 LIBRARY READING ROOM AND CAFE
- 7 CHILDRENS SPACE
- 8 VOID
- 9 ENVIRONMENTAL ATRIUM
- 10 WATER STORAGE TANK
- 11 COLLINS STREET RESERVE
- 12 LIFT



GROUND FLOOR



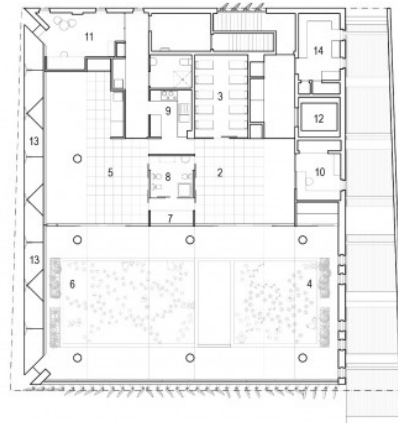
- LEGEND
- 1 LOBBY
 - 2 TEACHING KITCHEN
 - 3 FUNCTION ROOM
 - 4 STOREROOM
 - 5 BALCONY
 - 6 SURRY HILLS NEIGHBOURHOOD CENTRE
 - 7 MEETING ROOM
 - 8 LANGUAGE LABORATORY
 - 9 VOID
 - 10 ENVIRONMENTAL ATRIUM
 - 11 ADMINISTRATION



LEVEL ONE



- LEGEND
- 1 SECURE LOBBY
 - 2 U2 CHILDRENS PLAY SPACE
 - 3 U2 COT ROOM
 - 4 U2 OUTDOOR PLAY SPACE
 - 5 2-5 PLAY SPACE
 - 6 2-5 OUTDOOR PLAY SPACE
 - 7 NAPPY CHANGE ROOM
 - 8 COMMUNAL CHILDRENS BATHROOM
 - 9 HEAT AND SERVE KITCHEN
 - 10 CHILDCARE ADMINISTRATION
 - 11 STAFF ROOM
 - 12 LIFT
 - 13 ENVIRONMENTAL ATRIUM
 - 14 STORE ROOM



LEVEL TWO











