The complete absence of any liberal-arts style education makes New Zealand tertiary education sector unique in the English speaking world.

A liberal arts education aims at an intersection of science with literature and knowledge with persuasion. It is a solid, balanced education at a bachelor’s level.

The benefits of a well-rounded education are well known, and written about extensively. The architectural problem is “If a liberal arts college were to exist in New Zealand, how can its campus best be designed to encourage this well-rounded education?”

Developing a strong sense of community, both within and outside the college, lies at the heart of the liberal arts philosophy. With a strong, diverse community, differing perspectives can be synthesized into a common understanding, based on unchanging, fundamental principles.

The design of the campus is instrumental in developing this sense of community. This happens on many scales: the urban design of the campus, the relationships between the building’s functions, sizes, movements and sight lines and the planning and form of the buildings themselves (materiality, size, orientation, detailing).

This had been realized using fundamental design principles as laid down by Raymond Unwin, Cliff Moughtin and The tutors at Oxford Brookes School of Architecture in their book Responsive Environments.
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**Designing a Liberal Arts Campus in New Zealand**

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A Liberal Arts Education

“If you only have a hammer, you tend to see every problem as a nail.”
- Abraham Maslow

History of Liberal Education: The Seven Pillars of Wisdom

The kernel of today’s liberal arts education can be traced back to the Ancient Greeks whose education focused heavily on training the entire person, that is, the education of the mind, body, and imagination. The Liberal arts concerned the education required by a free man, as opposed to an education required by a slave (obviously, slaves required a vocational education). In the 5th century AD, Martianus Capella defined the seven Liberal Arts as: grammar, dialectic, rhetoric, geometry, arithmetic, astronomy and music in his work De septem disciplinis (“On the seven disciplines”). In the English speaking world, the universities of Oxford and Cambridge have carried on the liberal arts educational tradition through to the scientific revolution of the Renaissance. In the Renaissance, the typical liberal arts education expanded to an understanding of theology, communications, spirituality, arts and physics.

Liberal Education in the New World

Founded in 1636, Harvard University was the first university in the United States. The name "Harvard College" probably referred to the first (as it might have been foreseen) of a number of colleges which would someday make up a university along the lines of Oxford or Cambridge, and the teaching style and content reflected this. That is, the educational system was completely liberal arts focused.

By the early nineteenth century, the effect of the industrial revolution were starting to be

1 Abraham Maslow is considered the founder of humanistic psychology. Known for his Hierarchy of Human Needs concept. See David Fontana, “Approaches to Transpersonal Psychology” The Scientific and Medical Network http://www.scimednet.org/approaches-to-transpersonal-psychology/ accessed 13 July 2010
felt in the United States. As science and technology became more prevalent, a curriculum appropriate for the nation's colleges became a widely debated topic. American society was calling for its colleges to provide necessary knowledge and skills that would suite wider society in this new era. Advocates for change wanted a college that prepared students for work, whether it be in finance, agriculture, or industry. The curriculum should offer skill based, vocational education. Students would follow a specific plan of study to learn a trade and in this way, become a contributor to the wider community. In a reformed system, the nation's curriculum would meet the human-resource need for the commerce, industry, and agriculture sectors.  

**THE YALE REPORT OF 1828**

The Yale Report of 1828 was commissioned by Yale President Jeremiah Day to provide a defense of the status quo, that is, to defend what we now refer to as a Liberal Arts education. The authors of the Yale Report called for breadth in the curriculum: “In laying the foundation of a thorough education, it is necessary that all the important mental faculties be brought into exercise. It is not sufficient that one or two be cultivated, while others are neglected. A costly edifice ought not to be left to rest upon a single pillar.” The report goes on to say “The mind never attains its full perfection, unless its various powers are so trained as to give them the fair proportions which nature designed. If the student exercises his reasoning powers only, he will be deficient in imagination and taste, in fervid and impressive eloquence. If he confines his attention to demonstrative evidence, he will be unfitted to decide correctly, in cases of probability. If he relies principally on his memory, his powers of invention will be impaired by disuse.” Since its publication, The Yale Report of 1828 still provides the basic argument for a liberal education in the modern world.

Today, tertiary education in the English speaking world can be broken down into three broad classifications:

1. Vocational Facilities, (in New Zealand, Polytechnic Institutes) where the curriculum is based on the specific needs of industry.
2. Research Facilities (in New Zealand, Universities) where the facility's focus is research.
3. Liberal Arts Colleges (no equivalent in New Zealand).

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5 O’Hara, Robert J. The Yale Report of 1828 · Part I  Liberal Education and Collegiate Life 1
6 Committee of the Corporation the Academical Faculty, “The Yale Report of 1828” New Haven: Hezekiah Howe 1828 3
7 O’Hara, Robert J. The Yale Report of 1828 · Part I  Liberal Education and Collegiate Life 1
What is a Liberal Arts Education Today?

“[Liberal arts colleges provide] an education in which students learn how to learn, an education that emphasizes the forming rather than filling of minds, an education that renders our graduates adaptive to any marketplace, curious about whatever world is around them, and resourceful enough to change with the times.” - Michele Myers, former president of Sarah Lawrence College

"Not for livelihood but for life.” - The University of Science and Arts of Oklahoma's motto

The goals of a liberal arts education today have been stated in “Hidden Ivies: Thirty Colleges of Excellence”, by Howard and Matthew Greene. They say that in today's complex, shifting world “it is essential to develop a high degree of intellectual literacy and critical-thinking skills, a sense of moral and ethical responsibility to one's community, the ability to reason clearly, to think rationally and to respond to people in a compassionate and fair way”. They go on to say that it is desirable to learn over a lifetime, to be able to gain pleasure from works of art and be able to use them as inspiration and solace. He also notes that it is important that we are able to “revert to our historical past for lessons that will help to intelligently shape the future, to create a sense of self-esteem that comes from personal accomplishments.”

How this is achieved is given by educationalist Loren Pope in Colleges that Change Lives. He says that “The focus is on the student, not the faculty; he is heavily involved in his own education. There are no passive ears; students and faculty work so closely together”. He goes on to say 'Teaching is an act of love. There is not only a mentor relationship in class but professors become hiking companions, intramural teammates, dinner companions, and friends. Learning is collaborative rather than competitive; values are central; there is a strong sense of community. They are places of great synergy, where the whole becomes greater than the sum of the parts. Aspirations are raised, young people are empowered.”

This implies that the focus is not necessarily on what is being taught, but how it is being taught. There is a high level of student-teacher interaction, as manifested in small class sizes, the teaching is done by full-time faculty members (not assistant or part-time teachers). An implication of this structure is that professors are employed primarily to teach, not to research. There is a high level of student-student interaction caused by the residential nature of the schools, smaller class sizes and other extra-curricular activities such as a campus newspaper.

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various clubs and involvement in sporting teams.
All this develops a strong emphasis on creating active learning experiences, both inside and outside the classroom. The goal of a Liberal Arts college is to teach students strong communication skills (oral and written), critical and analytical thinking skills, a broad understanding of global issues, an appreciation for diversity, an ability to integrate information across disciplines, an application of knowledge, a foundation for making moral and ethical decisions and a sense of civic responsibility.

SENSE OF COMMUNITY

As a liberal arts education is reliant on a sense of community among the members (students, faculty, staff), it is pertinent to look at what exactly a sense of community is. There are various definitions. One of the most significant researchers in the education and educational psychology fields,12 Yale professor Seymour Sarason defines it as "the perception of similarity to others, an acknowledged interdependence with others, a willingness to maintain this interdependence by giving to or doing for others what one expects from them, and the feeling that one is part of a larger dependable and stable structure."13

David McMillan & David Chavis define sense of community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together."14 They identify four elements that give a sense of community:

1. Membership (includes boundaries, emotional safety, a sense of belonging, personal investment, a common symbol system)
2. Influence (members feel they have influence on the group and from the group)
3. Integration (members feel rewarded by participation in the group)
4. Shared emotional connection (a shared history, or identification with the history, and shared participation). This is the definitive element for a sense of community15

In order develop, or at least not destroy, this sense of community, the design of the campus can effect these elements in a number of ways. Obviously the biggest impact lies in the

15 Ibid p14
treatment of the physical boundaries, not just the boundaries of the actual college itself, but boundaries between members and boundaries between functions. A boundary can take many forms, from a wall to a visual axis to a level change to a change in material, change in scale or even a change in the form of a building. There are numerous opportunities for the design of the campus to affect the other elements. For example, shared participation can be fostered by arranging social spaces around social functions, or social functions around social spaces. Integration can be affected by the level of connectivity between various spaces, thus the people in those spaces, and buildings, thus the people in those buildings.

Vincent Scully's *The Architecture of Community* gives a slightly more detailed account on how a community can be designed. “it has to do with architecture at its proper scale and put to its proper use, which is the shaping of the human environment within the natural world, the building of the human community entire”\(^\text{16}\) He continues with “[Architecture] creates the physical reality of the human community, by which the individual is linked to the rest of humanity...”\(^\text{17}\) He contends that classical and vernacular architectural traditions have always dealt with questions of community and the environment, and that there is no reason why it should be consigned to the past “when everything is available to be used again; now, as always in architecture, there are models to go by and types to employ.”\(^\text{18}\)

\(^\text{17}\) Ibid 221
\(^\text{18}\) Ibid 225
The Proposal: New Zealand's First Liberal Arts College

Liberal Arts Colleges today take one of four basic forms:\(^{19}\):

1. A stand-alone public university
2. An external campus of a public university
3. A stand-alone private university
4. An external campus of a private university

Of course, there are endless permutations between these four models as well. For example, a venture between the University of Auckland and Stanford University in the United States would be accredited in both counties.

Each model has its strengths and weaknesses and with it, they all have differing architectural parameters, and needless to say, varying shades of politics and differing social implications. From a balanced (economic, political, social, architectural), standpoint the best model to base a design on is an external campus of a public university. The architectural implications of this are:

1. The enrollment size of the university can be contained to 800-1200 students. The inherent economies of scale that set a realistic figure of 4000 for a public university and 2000 students for a private university can easily be absorbed by its parent.
2. A ready supply of qualified teaching staff from the parent university.
3. Less administration space needed. A lot of generic administration functions can be done at the head office located offsite.
4. As it’s a publicly funded venture (or perhaps a Public Private Partnership), the cost of construction and materials become a factor.

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\(^{19}\) See appendix for a more detailed account of the four types of liberal arts colleges.
“The magical enrollment target is 1,200 [students] for a liberal-arts college” proclaims Douglas C. Bennett, the president of Earlham College, Richmond, Indiana. He goes on to say that that number of students makes an ideal learning and teaching environment for undergraduates. It is also the minimum enrollment needed for the college to offer a wide selection of courses and remain financially stable. This magic number wasn’t arrived at arbitrarily. Bennett takes the core liberal arts disciplines, including arts, humanities, social sciences, natural sciences and mathematics, what he refers to as the “arc of knowledge.” About 25 various programs or departments grow out of these disciplines and these programs account for the essential liberal arts education. Each department has three or four professors, which results in about 75 to 100 faculty members. With a faculty-student ratio of about 11 or 12 to one, the number of students comes to about 800 to 1200.

The main benefit of this number comes down to what he refers to as “an alignment of purpose”. This means that the entire faculty of the college is able to come together (as they do every two weeks) and discuss important issues with each other. “The whole faculty sits in one room and talks, you can’t do that elsewhere.” This entire-faculty connection reinforces the interdisciplinary nature of the college. Faculty members from different disciplines often interact. An example he gives is the chemistry professor who has read Moby Dick because it’s her best friends favorite book. In return, the English professor has some knowledge of chemical-bond theory because that was his best friend’s Phd thesis.
THE DESIGN BRIEF

“Practical considerations are often fixed, but the artistic can take varying form”

All liberal arts colleges have the following buildings. The area of each building is derived from Peter and Ernst Neuferts' Architects' Data and the Metric Handbook Planning and Design Data edited by David Adler, based on an enrollment of 1000 students.

MANDATORY PROGRAM

Accommodation 25sqm per student (25,000 sqm)
Sports field The size of a rugby field: 140mx50m (7000sqm)
Library 1.25sqm per student (1550sqm)
Common Rooms 1.5sqm per student (1500sqm)
Faculty office space 12sqm per faculty member (1200sqm)
Lecture theatres 1000sqm in total
Gym 15mx27mx5.5m (810sqm)
Main hall 700sqm plus subsidiary spaces
Dining facilities 0.45sqm per student (450sqm)
Classrooms 20 x 40sqm (800sqm)
Tutorial Rooms can double as faculty offices
Administration 450sqm

OPTIONAL PROGRAM TO AID IN PROVIDING VARIETY TO THE URBAN DESIGN

Professors' lounge, student lounge, shops, rotunda, outdoor theatre, cafe, bar, bicycle storage, car parking.

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27 David Adler, and Patricia Tutt, (ed.) New metric handbook Architectural Press (London, 1979) section 29.6 table II
28 Ibid section 29.6 table II
30 David Adler, and Patricia Tutt, (ed.) New metric handbook Architectural Press (London, 1979) section 29.6 table II
31 Ibid section 29.6 table II
LOCATION

An important component of any liberal arts college is the mix of students that attend there. A well rounded education means that the student learns as much from the other students in the class as from the teacher. For this to be as effective, a variety of different perspectives are needed. The traditional way of achieving this is to have as many income levels and cultures and countries represented as possible. This teaches the student to be citizens of the world, to understand, respect, and be able to work with people from different communities. It compels the student to learn how to identify and work within cultures or social groups different from their own, perhaps learn a second language, really understand what democracy is, and to identify and articulate their civic rights and commitments.33

Thus an international aspect to the college is very important for the education of the entire student body. Attracting student from other countries is crucial to this.

The location parameters for this project:

1. A New Zealand town with a population above 10,000. A college with an enrollment of 1000 would be 10% of the town’s population. This figure suggests that the town could support, but not be dominated by the university.

2. Not a main centre. A big component of the well-rounded liberal arts education means moving away from home. A community where the members live close by gives countless bonding opportunities (eating, discussing, doing activities) and thus the campus becomes a much stronger community.

3. A town that is close to various natural features such as forests, lakes and mountains

33 Official Quest University Website, http://www.questu.ca/about_quest/quest_at_a_glance.php (accessed 12 September 2010)
so studying these natural environments become second nature for the student.

4. A town that takes advantage of New Zealand’s natural beauty, thus would be an “easy sell” to an overseas student.

5. A strong tourist town would be desirable. The benefit of this is two-fold: 1. The students can have an even greater exposure to a wider range of cultures and perspectives. 2. The basic service infrastructure (shopping, bars, pubs, clubs etc) of a tourist town needs to cater to more people than the total population of the town, thus a resort style town is in a better position socially to support a university than a small non-tourist town.

These parameters lead me to consider just one option: Queenstown. Queenstown has the added advantages of:

1. An international airport
2. World renown skiing nearby
3. The lack of a university or polytechnic currently in Queenstown
4. The Queenstown Resort College, is an international hospitality management college located in downtown Queenstown. There could be numerous opportunities for shared activities, on a student level, a faculty level and even a management/marketing level without cannibalizing either markets.

Other tourist activities that can offer further bonding experiences between students.
"Approach any actual work with due humility. Find artistic expression for the requirements and the tendencies of the town. Don’t impose a pre-conceived idea."

With it's clear view to The Remarkables, views of Cecil Peak, Frankton Arm and Lake Whakatipu, the abundant sunshine, this flat site (a plateau in the hilliest of locations) presents a very daunting challenge. The under-riding philosophical approach was not to compete with the landscape, but complement it. Have the architectural program provide a reason for people to come to the area and enjoy its natural beauty without having the architecture detract from it. The worst possible outcome would see the project as a blight on this most beautiful of landscapes.

Illustration 5: Location Map of the Site. The main view shafts are highlighted, although, the site being where it is, there are good views to be had in every direction. Driving distance to the airport is 10 minutes; town, 15 minutes; ski fields, 10 minutes and 10 minutes from the Frankton Shopping centre.

Illustration 6: Walking distance to town, over the proposed bridge is 30 minutes, the golf course is 10 minutes, the quiet lake front beach, 1 minute, and the busier beaches at Kelvin Heights are 10 minutes away.

Illustration 7: Proposed bridge connecting Kelvin Heights Peninsular to Queenstown. This bridge is actually Santiago Calatravia’s Sundial Bridge in California.
The site itself has some specific architectural challenges. The first move to be made was to decide the limit of the site. For this I defer first to Sir Raymond Unwin, whom I've borrowed, as a homage the first three headings in this section. In *Town Planning in Practice* he suggests that the essence of town planning is found in the natural formality of ordered design welded to the natural informality of the character of the site. The art of the plan is found in the relationship between the two, that is how they are ‘welded’ together.35

Unwin implores the town planner to walk the site and imagine what would inevitably happen there. In my case, the laughter, the conversation, the activity of the central squares, the way people move throughout the site.\textsuperscript{36}

As I see it, the natural limit of the site is basically a triangle where the base of the triangle is formed on the western side by the pine corpse separating it from the houses of Kelvin Heights. The triangle ends in a point 600m to the east. It is effectively a dead-end as the bank going down to a gorge. The eastern limit of the site is naturally formed by either the beach or the edge of the bank that descends (rather sharply) 40m down to the beach. To the north, there is a six metre declivity (at it's lowest) that opens out to rolling fields.

In his “Of the City Survey” chapter in his book he suggests that the designer, rather obviously, understands the weather patterns, climate, rainfall and wind direction of the site. According to NIWA climate data, the average days of rain in Queenstown range from 7 to 9 per month, the average maximum temperature ranges from 22 degrees in the summer to 10 degrees in the winter. The average minimum temperature is from 10 degrees to 1 degree. The prevailing wind direction is from all angles, but predominately from the North East in summer and the South West in winter.\textsuperscript{37}

\textsuperscript{37} See appendix for further information
Unwin recommends understanding the history of the site to better understand the proposed future. The information for this site was harder to find, as it's a greenfield site that feels very remote. All the trees on the site have been introduced (pines, oaks et cetera). There is a well established croquet club, and a park to the North West of the site. There is also a BMX track for children in the pine grove that forms the western boundary. At present, the site is part of Deer Park, a tourist farm featuring exotic animals such as deer, bison and lamas. The park has since closed, but the animals and the fences have remained. In the last few years a walking track has been established along the top of the bank leading all the way to the development at Jack’s Point 20km away. These features are all positive attributes to the area (that is otherwise a nineteen-nineties sub-division) and thus should be preserved.

Unwin also recommends that the designer think of the points of natural beauty that should be preserved, that is, trees guarded from destruction and distant views to be maintained.38 It was this sentiment that helped me decide the southern limit of the development should be the edge of the bank, and not the rather lovely, secluded beach below it. Having the university buildings meander down the bank to the beach was an appealing prospect, but keeping the beach a secluded area was an even better one.

Illustration 10: The beach at the bottom of the bank – worth saving

Illustration 11: Approach from the road – worth saving. Note how the trees form a natural entrance way to the site.

Illustration 12: Approach from the Croquet Club – worth saving. Again the trees provide a natural gateway marking the entrance to the campus.
THE ARCHITECTURE

Illustration 13: Figure and Ground Diagram of the Final Urban Design.

CIVIC ART AS AN EXPRESSION OF CIVIC LIFE

Once again, Raymond Unwin provided inspiration at the start of this project. In the first chapter of Town Planning in Practice, he gives courage to the designer quoting Professor Lethal, “Art is the well going of what needs doing.” William Morris strengthens this position in a quote that dovetails nicely with the entire concept of a liberal arts education: “Beauty, or art, is no mere accident of human life, but a positive necessity of life – that is, unless we are content to be less than men.” In explaining his concept of “civic life”, Unwin compares modern (circa 1908) and pre-modern construction practices that is worth repeating here: “It was not deemed legitimate to sacrifice proper construction, good design or good finish in order to obtain the last possible degree of cheapness.” He goes on to say that a study of old towns and buildings is essential, but one cannot re-create the environment that they were built in. He recommends town planners and architects study and admire the form and architecture of old towns and buildings, but warns against copying. He asks what are the best results under modern conditions? What are

40 William Morris, The Beauty of Life A speech delivered before the Birmingham Society of Arts and School of Design, February 19, 1880
other possible forms of beauty?\textsuperscript{42}

In Unwin's opinion, in order to understand these forms of beauty, and be a competent town planner, he or she must have an appreciation of town planning history.

\section*{The Importance of the Site Survey & A Very Slight Sketch of Ancient Town Planning.}

The town planner must be careful not to effuse this individuality and drill all town plans into a similar style or pattern. The planner must have a appreciation of individuality, based on the natural inclinations of the site and the culture of the people\textsuperscript{43} (or, in my case, the program).

An appreciation and knowledge of the history of town planning is of utmost importance. Studying the historical development of urban design guides the current design.\textsuperscript{44}

\begin{figure}[h]
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\includegraphics[width=\textwidth]{Illustration15.png}
\caption{Map of Palmyra from www.galenfryrender.com}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Illustration14.png}
\caption{Plan of Triumphal Arch, Palmyra. Drawing by author}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Illustration16.png}
\caption{Colonnade/Stadium Junction with Triumphant Arch}
\end{figure}

\section*{The Ancient Architecture of Greece and Rome}

The remains of the cities of Ancient Greece prove that they were laid out on definite and regular lines. At the same time the Greeks took advantage of natural features and were ready to upset the regularity of their arrangements to take advantage of hillsides or ricky outcrops to give grandeur to important buildings. It seems that private dwellings and private buildings were insignificant while the public buildings and places were usually laid out on a scale of magnificence that astonishes us. He cites the plan of Ephesus as a good example.\textsuperscript{45} The Great

\textsuperscript{42} Ibid 14
\textsuperscript{43} Ibid 37
\textsuperscript{44} Ibid 37
\textsuperscript{45} Ibid 37
Agora itself is the centre of public buildings, squares, theatres, gymnasium and race courses. Civic life expresses itself magnificently.46

Illustration 17: Plan of Ephesus, Ancient Greece, after Sir Banister Fletcher’s a History of Architecture

At Palmyra, Antiochus Epiphanes laid out a street with a double colonnade two miles long in 170BC. There is a curious bend in the main colonnades street treated with triumphal arches so that either way, the arch seems to terminate the street.47

In general, where conditions allowed, streets were laid out on a square, regular lines opening out in places into great squares (or agroe) leading up to temples and other public buildings.48

In formulating my approach to the design philosophy of the campus, it was interesting to note that the Ancient Romans had less consideration of site than the Ancient Greeks. Where the Greeks adapted to the site, the Romans adapted the site to the arrangement of the layout. The general layout of a Roman city was two main thoroughfares laid out at right angles with a forum aligned to either street with buildings between them.49

Another factor for me was the were two prominent organising factors as presented by Cliff Moughtin in Street and Square. He identifies two fundamental concepts in urban design, the building as object and the space as object. Two of these spatial organising principles are axial composition and space as a unifying principle.50

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46 Ibid 37
47 Ibid 37
48 Ibid 37
Axial composition

Axial composition most commonly used in the nineteenth century, and “raised to the level of Dogma in the Beaux-Arts.” All the buildings elements, both inside and outside face each other, their centre lines coincide to form an axis. All the buildings elements (doors, windows, rooms et cetra) all bear a spatial relationship to each other and to the composition as a whole. Minor axes relate buildings across the major axis. Usually, the place where several axes meet is marked by a monument or a landmark. Famous examples of this are the Arc d’Triomphe in Paris or the All-India War Memorial in New Delhi. Pope Sixtus V transformed Rome in 1585–90 using this principle. He developed long vistas between the seven main churches and holy shines a pilgrim expected to visit in one day. Using these vistas as a guiding principle set the rest of Rome’s urban development. At the termination of the vistas, obelisks were raised and around these important nodes and routes were later to develop. Today, many a town scheme is dependent on a dominant structure placed at a strategic place along a tree lined vista. This can be successful if the vista isn’t too long, and where the axis passed through a number of urban spaces. This arrangement can lend character to a townscape.

The Campus can be considered as an axial composition. The main organising axis runs the length of the project with sub cross axes running parallel to this through the entries and living spaces of the accommodation buildings and the classrooms with their respective courtyards. The main plazas run perpendicular to this main axis and all the major buildings are aligned to it.

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51 ibid 77
Space as an Organising Concept

Frederick Gibbert, author of *Town Design*, states that axial planning, done poorly leads to buildings in a row like ‘meat on a skewer.’ In the nineteenth century, Camillo Sitte advocated turning the axial paradigm inside out by designing the three-dimensional space first, not the buildings. The building merely become walls for the space. Sitte’s pattern of the city developed in such a way that the scene becomes the most important part of the space and the buildings are there to support it.

Illustration 19: Diagram showing the spatial composition of the Campus

In developing a community, I believe that it is of utmost important to that the public spaces set a scene for where the students can see and be seen. Therefore, I used this approach in designing the urban space, all the spaces were carefully designed, including the main boulevard using trees to enclose the space (see the *enclosure* section below).

Order & Unity

Referring back to the initial stages of the development of this project, I again looked to Raymond Unwin where he reminds the designer that “Practical considerations are often fixed, artistic ones can take varying form.” In his chapter “Of Formal and Informal Beauty” he maintains that nature can be used to its best advantage by clearing away obstacles, opening up views and framing those views in a suitable way. According to Unwin, design is at its best when

it uses nature, it doesn't imitate it. A “correct” mix of formality and informality of design can save from rashly destroying trees or other existing features and a belief in the rightness and importance of definite design will prevent him from sacrificing it unduly to quite minor features on the site. He implores the the designer to “design with the correct spirit in the heart.” This resonates with Cliff Moughtin when he discusses Order in design: “The discipline to give structure and order to the potential anarchy and chaos of eclecticism is urban design.” All major renaissance treatise writers, from Aberti to Serlio write in their treatises that beauty is derived from following God's natural order. Even the early modernist Walter Gropius mentions the ideal of some higher order. Christopher Alexander supports this in The Oregon Experiment: “let us begin with the idea of organic order. Everyone is aware that most of the built environment today lacks a natural order, an order that presents itself very strongly in places that were built centuries ago. This natural or organic order emerges when there is perfect balance between the needs of the individual parts of the environment and the needs of a whole.” Most buildings can be seen from the civic landscape (the street or the square). Therefore, the public face of the building is of prime consideration. The building's facades operate in the public realm, and by establishing order here, the buildings take their place within a disciplined framework. He argues that the building's plan is not the generator, but that the generator is the building's context. Giving primacy to the public domain or context of the building is the foundation for good city building and a very necessary discipline for the architect.

Unity in urban design is likened to language. Moughtin refers to the 'grammar of architecture'. In discussing unity, he cites Robert Venturi “[urban design] must embody the difficult unity of inclusion rather than the easy unity of exclusion”. In other words, the architecture must work together, not apart. How the campus works together is covered in later sections of this paper.

55 Ibid 120
56 Ibid 120
58 Ibid 25-26
60 Cliff Moughtin, Urban Design: Street and Square, Butterworth-Heinemann Ltd (Oxford 1992) 30
61 Ibid 28
Raymond Unwin gives what he calls Practical Guidelines concerning the way the buildings work together and with the environment. That is, he suggests that a degree of orderly design in the main lines of the scheme make it understandable. This doesn’t always require exactitude of symmetry. This particular point is echoed by Benson et al in *Responsive Environments* when they describe “legibility” (see below).62

**BOUNDARIES AND APPROACHES**

In terms of the first broad strokes of the design, Unwin again proved invaluable in giving advice on the boundaries and approaches to the site. He remarks there is real value in limiting towns, suburbs and new areas generally and references ancient walls and gates. In a modern

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town, walls and gates are no longer very appropriate, but he maintains that there are numerous ways this can be done including using playing fields, forests and general breathing space. All of which have been employed in the final design of the campus.

Once these initial broad guidelines had been painted, the next step was to grasp the urban design in finer detail. For this I primarily studied *Responsive Environments* edited by Ian Bentley and written by Sue McGlynn, Graham Smith, Alan Alcock and Paul Murrain. The authors' position in this book lies in linking the ideals of democracy through appropriate design ideas into the fabric of the built environment. That is, the Responsive environments is a practical urban design handbook, the first of its kind in the modern era. They argue that maximum responsiveness is brought about by the marriage of a democratic setting with a maximum degree of choice and that design affects the user’s choice in seven key ways, the first of which is permeability.

**PERMEABILITY**

Permeability refers to where people can go, that is, the number of ways through an environment. This has fundamental layout implications – it is the number of routes, links, development blocks and the boundaries the design offers. Of the seven key ways a user's choice can be effected, this principle has the biggest impact.  

Illustration 22: Illustration showing the movement and node patterns of the Campus

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63 Ibid 42
Permeability recognises that people have both public and private roles, thus both public and private spaces are needed for a good urban design. These roles and spaces are complementary, people need access to the interface between them. Both the public and the private realms have different implications for the permeability of the design.64

PUBLIC SPACE

For the public space to be most effective, the routes must be visible. This depends on how the environment is divided into blocks. Note in the diagram above, there are three major public routes through the campus. The route from the north starts at the entrance and moves along the contour line with the (curved) axis terminating in the dome of the library. The main route is a 600m long straight boulevard starting from the main entry, with the library terminating the axis. The other main route in superimposed on the existing walking track that acts as a promenade along the side of the southern bank. This route is the only one that carries on past the site ending 20km away at Jack's Point.

Smaller blocks give more physical and visual permeability65. Because of the demanding accommodation requirements for the campus, small block sizes were not able to be achieved. To negate the negative impacts of this, the middle five bays in each accommodation block are a completely transparent on the ground level. That is, no walls, just a unobstructed view through the arcades visually and physically linking all three main routes.

Vehicle and pedestrian separation decrease the permeability of the public space.66 On this site, there is only a small demand for vehicles owing to the fact that the vast majority of the people on campus both live and work there, everything that is required is catered for on site. There are also no designated car-parks, but plenty of space for parking on the many courtyards provided.

THE PUBLIC/PRIVATE INTERFACE:

The interface is divided into two areas, visual and physical permeability. The visual permeability enriches the public domain but can confuse the vital distinction between the public and the private realm. Not all private activities are equally private, for example the entry hall is a far more public space compared to the toilet. This is shown in the accommodation buildings with the entries and lounges opening onto the boulevards with hallways leading to the study/bedrooms, and a totally enclosed ensuite for each study/bedroom. There is an issue of the

64 Ibid 12
65 Ibid 12
66 Ibid 12
ground level bedrooms facing public space. This has been avoided by placing the bedrooms on a 1m plinth so that any windows are at least 2m above the ground thus out of anyone's eyeline. The courtyard typology has been used in the classrooms as well, with the entrances inside the courtyards and only windows looking out. This phasing of public/private is also used in the lecture hall area off the main plaza. Having arcades or colonnades around the inside on the courtyards and plazas also helps activate the edges of the public space.

Illustration 23: Diagram showing the public/private interface

The courtyard is a crucial design response to the blending of the public and private realms by realising the need for a front and a back of a building. The back (inside the courtyard) houses the most private activities. If a private activity is housed at the front, then walls must go up, thus deadening the public space. Courtyards prevent the need for this. The point of the public/private interface is to make life richer by correctly blending the two, not to destroy privacy or deaden the public space. The degree of the permeability is under the control of the private user. This has be achieved on the campus by using level changes (as stated), windows, drapes and balconies.

**VARIETY**

Variety gives the range of uses and effects the choices of the experience, in other words, it is about locating the uses on the site. The design goal is to maximize the variety of uses in the
Variety focuses the designer on the current life of the community. If a space has more variety in it, the different functions can energize each other to an extent where the sum of its parts adds up to more than just the brief itself. This requires the need to establish a relationship and a proportion between different parts of design. This also requires the development of a definite centre, that is, to group important buildings so they don't get lost. In turn, this helps activate the main plaza and the boulevards off it. Another element to this is the mixture of uses that one space might have. For example, a lecture hall during the day can double as a movie cinema during the evening. A cafe in the morning becomes a bar at night and so on. This ensures that the main public spaces are activated for longer periods each day.

In terms of designing a campus, this concept is very simply applied. In this project, the notion of variety is closely related to the formulation of the brief. Maximum variety has been achieved by adding service shops to the main plaza, for example, a hairdresser, a bar, a bookshop or stationary shop and other shops that appeal to students. In the far more complicated realm of

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67 Ibid 27
69 Ibid 27
designing cities it is far more complex, involving feasibility studies on the political, economic and social levels.

LEGIBILITY

Legibility refers to the massing of the buildings and the enclosure of the public space. The opportunities that are offered to the visitor need to be understood by the visitor by way of a layout that is easy to understand and satisfactory to be in. This is where the urban design requires to be thought of as a three-dimensional form. The routes and junctions are differentiated from one another by designing them with different qualities of spatial enclosure. It is the volumes of the space that are the key here. Legibility has two main design issues: Ease of navigation and the spatial quality of the outdoor space.

NAVIGATION

In *The Image of the City*, Kevin Lynch describes how the visitor can form clear, accurate images of the urban scheme. Note, it is the user who forms the image, the designer can only arrange the physical layout. People remember different things and have a different way of navigating through a space. A legible design will have a big overlap in different individuals own images of the space.\(^7\)

The five key elements in designing legible navigation are Paths, Nodes, Landmarks, Edges and Districts.

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1. **Paths** – the channel of movement. For the campus this main paths of movement are the boulevard, the promenade, the beach access and the northern access point. Secondary paths of movements move north and south through courtyards.\(^{71}\)

2. **Nodes** – the focal points of the urban space. These are the main plaza and the second plaza anchored by the library. The accommodation courtyard act as nodes for their respective inhabitants. The classroom courtyards do the same.\(^{72}\)

3. **Landmarks** – points of reference that the user experiences from the outside. They can't really be entered.\(^{73}\) In the campus design the landmarks are the gym, the main hall, the tower, the teacher's common room and the library.

\(^{71}\)Ibid 49  
\(^{72}\) Ibid 72  
\(^{73}\) Ibid 78
4. **Edges** – These are linear elements that are not paths. In this case, the banks, declivities and the edge of the tree line on the western side of the site. Also the edge of the rugby field could be considered as well.

5. **Districts** – Parts of the overall urban design that operate semi-autonomously with their own paths, nodes, landmarks and edges. This is more a guide for city design, but there are definite districts in the campus. To the west is the accommodation and sports districts centered around the rugby field and main boulevard, in the middle is the social hub around the main plaza, main hall and the lecture room courtyard. To the east is the academic district anchored by the eastern plaza and the library.

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74 Ibid 62
75 Ibid 66
THE SPATIAL QUALITY OF THE OUTDOOR AREAS

This can be divided into a number of different parts – the degree of enclosure, the proportion, the relationship between the scale and the proportion.

ENCLOSURE

The principle of enclosure relies on the principle of figure and ground. In particular the possibility of the space being the figure\textsuperscript{76}. On this matter, Cliff Moughtin refers to Kevin Lynch and Christian Norburg-Shultz on their studies of human perception and how they relate to the perceived unity of an urban space. That is, the concept of figure and ground and establishing centres, (proximity), directions (continuity) and domains (enclosures). The composition is the art of creating visual unity for each of these three components. To re-enforce the normal tendency to see, understand and respond to vivid coherent concepts.\textsuperscript{77} In order to do this, the space needs to claim the perceptual boundary between it and the buildings. This is a fragile thing, everything in the environment has to work together or the feeling can quite easily be lost. By analyzing well known successful spaces (for example, Piazza Navona in Rome), Ralf Weber gives five principles for enclosure of open spaces; centricity, concavity, closure and peripheral density, uniformity and coherence of boundaries and the internal division of space and spatial density.\textsuperscript{78}

\textsuperscript{76} Weber, Ralf, \textit{On the aesthetics of architecture - a psychological approach to the structure and the order of perceived architectural space} (Avebury, Aldershot, USA 1995) 132
\textsuperscript{77} Ibid 136-7
\textsuperscript{78} Ibid 138
1. **Centricity** – The space is proportioned so it has an easily perceived centre. This centre doesn't need to be marked (for example, with a statue).\(^79\) As one can see in the diagram above, most the main plazas and courtyards in the campus have been designed this way.

2. **Concavity** – A concave line holds greater centrality, thus a greater chance to achieve enclosure.\(^80\) Note the buildings that 'bend' inwards in the main plazas particularly the elliptical plaza adjacent to the library.

3. **Closure and Peripheral Density** – The more enclosed the space is the better. This is applicable in both the plan and the section. In plan the most common way to achieve this is with buildings. Trees and walls can also be used. In section the primary way to achieve

\(^{79}\) Ibid 139
\(^{80}\) Ibid 143
closure is the height-to-width ratio of the space. A ration of 1:1 is the best and can be extended to 1:7, after this enclosure is usually lost. The feeling of closure can be enhanced with the use cognitive contours such as roof overhangs or string lights to imply the 'top' of the space.81

4. Uniformity and Coherence of Boundaries – Enclosure is helped by the building facades that face the public space have similar scale, fenestration, material and decoration82. This is echoed by Cliff Moughtin when he quotes Heinrich Wolfflin “...a system of greater and lesser parts where the smaller prepares one for the larger by prefiguring the form of the whole.83” A central or focal idea should be clearly apparent. In urban design, the main town square becomes the focal point. Unity can be achieved through one building material, a repetition of building elements such as roof pitch, eaves, ridge details and constant use of similar elements such as doors, windows, columns et cetera.84

5. Internal Division of Space and Spatial Density – This concerns the placement of elements within the space to divide the it into smaller entities or mark the centrality. These elements can be visually powerful, and care is needed so they don't dominate the sculptural quality of the space.85

Raymond Unwin stresses that while the principle of enclosure is of vital importance, it need not be the only desirable thing. To illustrate this he mentions the “carefully guarded sea views of Constantinople”86. But enclosure and sea views are not the only conditions to be considered.

SCALE AND PROPORTION

Cliff Moughtin has a slightly different take on this aspect of closure. For him, the height-to-width-to-length ratio is the essence of a scale-proportion relationship. Instead of simply giving a empirically derived ratio, he refers the proportion to human scale. For example a regular door is 2000mmx750mm and based around the human figure. We expect larger doors to hold the

81 Ibid 148-153
82 Weber, Ralf, On the aesthetics of architecture - a psychological approach to the structure and the order of perceived architectural space (Avebury, Aldershot, USA 1995) 154
84 Ibid 58
85 Weber, Ralf, On the aesthetics of architecture - a psychological approach to the structure and the order of perceived architectural space (Avebury, Aldershot, USA 1995) 156
same proportions. In commenting on public spaces, Moughtin quotes H. Maertens' 1877 book *The Optical Scale of the Plastic Arts* extensively in explaining the rational behind certain measurements. Maertens conducted multiple experiments to discover relationships between distances and human experience. In particular, at 35m a face becomes expressionless, people can be distinguished at 12m, people can be recognised at 22.5m, body gestures can be read at 135m, people can be seen as people at 1,200m. From this data, Moughtin develops the following scale:

- 12m distance is intimate.
- 24m distance a person is completely recognisable.
- 1200m distance is the farthest extent that can still be considered 'human'.

These interpretation of the human scale was considered exhaustively in the design stages of the campus. But due to the south-facing site and the demanding accommodation component of the brief, keeping strictly to 12m-24m-1200m meant that achieving these ratios had two major implications. One is that Queenstown has a winter sun angle of 22 degrees, and a summer sun angle of 68 degrees. Maintaining a 24m space between building elements meant plunging the majority of the campus into shadow for a lot of the time. The other was denying a much bigger proportion of the campus the best views.

There is more to this human dimension: The module of experience is given as a 20 minute walk, or about 1.5km in diameter. This is the largest unit of urban design. This 1.5km diameter urban design can become a home if it’s small enough (ie, within easy human walking distance. Well within the dimensions of the campus. “The limited size of the known places naturally goes together with a concentrated form. A centralised form is round, this place is what Christian Norburg-Shultz calls a ‘round’.”

Perhaps more interestingly, In *Defensible Space* in 1972, architect and urban designer Oscar Newman discovered a strong correlation between the crime rate and areas with excessive height and size. This, he concluded, was because residents felt no control or personal responsibility for an area occupied by so many people.

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88 Ibid 38
89 See the Design Process section in the appendix
ROBUSTNESS

Robustness is the spatial and constructional arrangement of the buildings and the outdoor spaces. What constitutes a good degree of robustness is that the same space can be used for many different functions.92 Again, following this principle allows for maximum choice for the visitor/inhabitant. The focus here is on the individual buildings and the outdoor spaces. The spatial and constructional organisation is suitable for the widest possible use, both in the long term and short term.

Activities that occur in public space are public activities. They rarely need to be separated from each other. The activities themselves act as the most important support for the other activities. The point of operating in a public space is to see and be seen. If the activities are compartmentalized, then the robustness is removed. In the design of the campus, great care was taken to define and enclose the public space and also to maintain a dialogue between them.

This principle has been shown in the design of the campus, in particular, the buildings that open onto the main plaza. Their internal layout has been taken into account. The hard areas such as the stairways, lifts and entrances have been positioned so they don't restrict the space that either opens or could open into the public space.

There are also active and passive functions to a building. Active functions can benefit from going outdoors, visual contact can make the experience more interesting. In the campus design, these active functions have been taken advantage of in the forms of cafes/bars, restaurants and shops on the ground floor helping to activate the plazas.

At a larger scale, there is the question of the use of the university over the summer months. Of course, an easy way to answer this is to offer summer classes, but these inevitably involve much smaller student numbers and a skeleton staff. The use of the campus is hardly maximised this way. Going outside the field, conferences could be held there, summer camps for children, straight accommodation or anything else of a similar nature.

DESIGNING THE EDGE OF THE SPACE

For most people, the edge of the space is the space. Activating this edge is crucial to designing a good public space.93

There are three fundamental ways of doing this, establishing horizontal differences,

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93 Ibid 59
vertical differences and a combination of both. Residential balconies, terraces for pubs and restaurants and display areas for shops all contribute positively to activating the edge and have been used extensively in the campus design. These elements are also beneficial in designing the public/private interface as discussed above and all have been used in the campus design.

The edge is where people watch the activity in the public space. To make this experience more enjoyable, it is desirable to actually extend the edge, and to indent the edge. These techniques have been employed to increase a feeling of refuge in the campus design. It is also advantageous to offering places to sit “that don’t look forlorn if no one is sitting there.”94 Niches, string courses, column bases and steps have been used in the campus design to achieve this.

94 Ibid 60
<table>
<thead>
<tr>
<th>The Design Process – Urban Design</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Concept</strong> – Library at the end of the main axis</td>
</tr>
<tr>
<td><strong>Initial concept sketch design of library at the centre of the campus forming two axes</strong></td>
</tr>
<tr>
<td><strong>Rotunda at the centre, gym and field forming sub axis across main axis</strong></td>
</tr>
<tr>
<td><strong>Main plaza opening up to best views</strong></td>
</tr>
<tr>
<td><strong>Bramantesque main plaza on two levels with gym and library forming sub axis, hall at end of main axis</strong></td>
</tr>
<tr>
<td><strong>Revision with rotunda or tower becoming the focal point of two main spaces</strong></td>
</tr>
<tr>
<td>Main plaza with gym, library and tower off main plaza with best views</td>
</tr>
<tr>
<td>Field on other side of the north-south axis. Original idea was to have an access point to the north on the west side of the hill</td>
</tr>
<tr>
<td>Return to the two-level main plaza</td>
</tr>
</tbody>
</table>
Plaza with views to the east, tower et cetera

Rotunda forming the central space with secondary spaces off it

Naturally, these designs are very divergent in nature. As many possible re-iterations of the main building blocks of the scheme (axes, plazas, main buildings) is desirable so the possibility of finding the urban design with the best fit is heightened. A major breakthrough at time stage was achieved by having the northern access point coming into the site from the west along the existing road. This relieved the design of one more axis to resolve.
Defining the main plaza space. Field separating the accommodation from the rest of the campus space.

Revision, adding accommodation and shaping space

Revision with field separating the campus from the town

Revision adding buildings

Diagram of spaces

Functions added
Unfortunately drawing are missing that show the evolution of the previous figure and ground scheme and the next scheme. The design became a lot more axial with the main axis re-introduced taking an even more prominent role than in previous designs. The main design problem was containing the outdoor spaces and still maintaining the axis. An attempt to resolve this was having the axis passing through buildings, that in turn also contained the space. The main plaza was kept open to the south.

End result of another exploration with the library anchoring the main axis. Axis passing through buildings with a variety of spaces intersecting the axis.

Model of the scheme.

This scheme was promising, but it had unresolvable legibility issues. Back to the drawing board...
These next two schemes are two of many attempts of “ironing out the legibility problems in the model.

<table>
<thead>
<tr>
<th>Diagrammatic scheme showing accommodation for 2000 people.</th>
</tr>
</thead>
</table>

Finding spaces in the diagrammatic scheme – reintroduction of the gym-field sub axis.
These designs are becoming more and more convergent. A breakthrough was made with flipping the main plaza with the main hall. I had been resisting this because the views from the mail plaza become compromised. But this is a positive thing, it results in a more urban environment, more functions opening onto the main plaza and a greater level texture for the campus as a whole.

The scheme was nearly ready, but the quality of the two main plazas (main, library) needed work.

<table>
<thead>
<tr>
<th>Resolving the shapes of the two main plazas:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failed first attempt.</td>
</tr>
<tr>
<td>Failed second attempt of the main plaza, start of the ellipse of the library plaza.</td>
</tr>
<tr>
<td>Formulation of the library Plaza The design problem of having a satisfactory space that is anchored by a building that terminated three vistas. From all the shapes, an ellipse can do this the easiest.</td>
</tr>
<tr>
<td>Searching for a more inspired shape for the main plaza required going back to the natural geometry of the site and the working with it.</td>
</tr>
</tbody>
</table>
Illustration 31: Final design drawn at a scale of 1:2000. All main spaces, buildings and functions are resolved.
The Buildings

The last three of the seven key principles that Bentley et al asserts are Visual Appropriateness, Richness and Personalisation. These principles don't have as much impact on the overall urban design as the previous four, but nonetheless have architectural implications. Other factors I've considered, apart from their relationship to the environment, is what Cliff Moughtin calls Harmony and Proportion; Symmetry, Balance and Rhythm; Rhythm, Harmony and Contrast. In terms of the design of the campus, it is important to note that all factors relating to the design of the buildings are dictated by the urban design. That is, all the buildings are subservient to the overall architecture of the campus and their place in it.

For the architectural style of the campus, formal precedents I've studied are Bramante's House of Raphael, Gian Lorenzo Bernini's and Pietro da Cortona's designs for the Louvre, Paris, the entrance to Guarino Guarini's Palazzo Carignano. Claude Perrault's East Facade of the Louvre, Paris 1667-74; John Nash's design for Regent Street, London 1821, Claude

96 Peter Murray, The Architecture of Renaissance Italy (Chicago: University of Chicago Press 1987) 115
97 John Varriano Italian Baroque and Rococo architecture (Oxford: Oxford University Press, 1986) 59
98 Harold Alan Meek, Guarino Guarini and his architecture (Boston: Yale University Press, 1988) 37
LeDoux’s Hotel Guimard Paris, 1770; Jacque-Germain Soufflot's Ecole de Chirurgie; Jacques Gondoin, Charles de Wailly's Chateau de Montmusard, Dijon 1812, Etienne-Louis Boullee’s Hotel Alexandre, Paris 1763-66 and Hotel de Brunoy, Paris 1775-79.99 Leon Krier’s concepts for Pliny's Villa and Atlantis100 Plans for Delphi and Hadrian's Villa.101 McKim, Mead and White have had a large impact, Henry Villard Residence, New York City, 1885; Columbia University Library, New York City, 1893; Plan of the Library Group, New York University, 1896; F.W. Vanderbilt Residence, New York City, 1896; The Brooklyn Institute of Arts and Sciences, 1897; State Savings Bank, Detroit, 1900; House for James J. Goodwin, New York City, 1898; The University Club, New York City, 1900; Estate of E.D. Morgan Wheatley Hills, Long Island, 1900; The Rhode Island State Capital, Providence, 1895-1903; J.J. Astor Courts, Rhinebeck, New York, 1898; Oelrich's Residence, Newport, NY 1902; The National KcKinley Birthplace Memorial, Niles, Ohio, 1915.102 103

100 Leon Krier, Architecture, Choice or Fate? (Papadakis Publisher, 1998)
103 For the drawings please refer to Appendix 20-31
BUILDING MATERIALS

The entire site is on the side of hill that is almost entirely made up from schist. This narrows down the choice of material available substantially. The rough nature of the stone can be tamed with strong, fine, pre-stressed, pre-cast concrete elements such as window and door frames, columns, entablatures and other building elements.

Illustration 34: Thomas Jefferson’s University of Virgina. Instead of bricks, the buildings on campus will be made from schist taken from site. Terry Barnes from Peddlethorp Architects claimed they could have retained 90% of the schist excavated from the Kawarau Falls Station project just on the other side of the hill.
Visual Appropriateness, Richness and Personalisation

Visual Appropriateness

Visual Appropriateness applies to the external image of the project, and specifically how the user is aware of his or her choices based on the appearance of the buildings. For example, it is desirable that a library looks like library so the visitor knows that it is a library, and can use it as such. Visual appropriateness supports variety, legibility and robustness when the visitor, or the inhabitant, can correctly interpret how to make correct use of the environment. In designing a liberal arts college, a custodian of knowledge, it must look as such. That is, a liberal arts museum shouldn't look like an industrial park or a museum of modern art.

Appropriateness to the Times

A claim that a building should 'belong to its time' presents numerous difficulties. What are these times that the building should be appropriate to? The unrelenting march of technology? The never ending quest for individuality over community? “The problem is how and by what criteria we are to decide what aspects of modern times modern architecture should express.”

The modernist movement advocated expressing technology by using architectural elements such as bare walls, flat roofs, asymmetry and strip windows to do this, even though there is no logical connection between the two. In fact, with advances in mass production, modular and off-site construction techniques and technical advances in materials, producing classical architecture can really be advanced by modern technology. It is in the modern environment that I propose to build the university using up-to-date heating (under floor heating powered by a heat pump) and cooling systems (air conditioning), water reticulation and solar hot water systems.

Richness

This refers to the choice of the sensory experience open to the visitor and is the most detailed level of the urban design. It is desirable that civic buildings receive special treatment in terms of materials, construction technique, ornamentation etc.

Richness is involved in the emotional effect of those visiting the place. A Concise Townscape by Gordon Cullen gives an excellent account of this when he refers to the “unlooked for surplus.” His his three design gateways, Serial Vision, Place and Content “unlock the drama in the urban

105 Ibid 180
PERSONALISATION

Personalisation: Make the design encourage people to put their own mark on the places they live and work. Personalisation: This is the extent that a visitor or inhabitant can put their own stamp on the physical environment. The design should support this without eroding the public role that the building has. Personalisation ranges from the ability to move a chair in a room, to being the ability to change the facade of a building. This principle is a little problematic for designing a university campus. The vast majority of the people who live there are only there temporarily, for about nine months of the year for four years, thus can never have the credibility to be able to force their personality into the public realm in an architectural sense. As I see it the appropriate level of personalisation lies in the inhabitant's ability to control their own inside space. Architecturally, this means giving the students a choice of a completely empty room so that can personalise it, or a room with furniture already in it so he or she doesn't have to buy their own and then sell it later. The degree of personisation thus lies with the user, and is confined to their own space.

There are other ways that personalisation can have a positive effect on the architecture of the campus and help build a sense community at the same time. For instance, a wall or a path can be erected on the campus that made up of bricks or flagstones that the members of the graduating class have personalised.

Harmony and Proportion

In the classical school of design all the scales and proportions are locked in order. Made up column, entablature and moldings, the entire design expands and contracts together. In Ancient Greece temples never exceeded 20m in height, but even so, this modular design could have easily lead to gigantism. Even if two classical buildings are adjacent, confusion can still arise if those two buildings have different scale modules.107 On the campus, With the different functions for buildings that are in close proximity to each other, a common module is essential. The basic module on campus is based on the width of the bedroom/study areas - 3.5m. This dictates a column width that is about 800mm in diameter, assuming intercolumnnation smaller than 1:3 (Vitruvius recommends 1: 2.25). This requires the height of the columns to be between 6m (Tuscan) and 9m (Corinthian). The appearance module can be adjusted by techniques like putting the columns on pedestals, using attic stories, setting the columns/pilasters on string courses, pairing the columns, utilising stairs and basements et cetera. Using a classical module system ensures that the building is not only in harmony with itself, but its also in harmony with humans.108

108 Ibid 51
Symmetry, Balance and Rhythm

In the opinion of Moughtin, a person with a sense of proportion is likely to a well adjusted, reasonable human being.\textsuperscript{109} It is the same with buildings. Symmetry implies an axis of movement in nature. We can symmetry in anything that walks, flies, runs or rolls. In architecture, this means that a symmetrical composition is best revealed when moving along the axis.\textsuperscript{110}

Asymmetry

A great weight close to the fulcrum will balance out a lesser weight far from it. Notional

\textsuperscript{109} Cliff Moughtin, Urban Design: Street and Square, (Oxford: Butterworth-Heinemann Ltd, 1992) 52
\textsuperscript{110} Ibid 58
weights of architectural masses can achieve a balance. The masses must revolve around a point of balance or a dominant focal point of interest. It is to this point that the eye is first drawn to, then goes back to. A badly composed picture will look ‘top heavy’ or ‘lop sided.’ This can be avoided by having a centre line near the centre of the composition, or at least in the middle third. The perceived centre line for the campus is the main boulevard that runs through the middle of the campus.

Illustration 38: Diagram of the axial nature of the composition of the campus

Illustration 39: Plan of the main plaza

Illustration 40: Diagram of the min masses that form the main plaza. The height of the tower balances the length of the space. The main hall anchors the plaza at one end, balancing the outdoor theatre at the other end.

ibid
RHYTHM, HARMONY AND CONTRAST

A rhythm is a pattern imposed by the mind. It is a product of the grouping of elements. A rhythm can suggest an emphasis, an interval, accents and direction.\textsuperscript{112}

Along with a rhythm, contrast has to introduced. The contrast adds both interest and accent. The contrast has to be kept within proportion. A correct balance in the contrast is the key to order. “Aesthetic success is conditioned upon the victory of order, but there has to be sufficient complexity to make the victory worthwhile”\textsuperscript{113}

A good composition is harmonious and dependent on achieving unity through proportion. It needs consideration of contrast.\textsuperscript{114}

Consistency in the composition can be achieved through devices such as repetition of materials, repetition of details and heights of the buildings. Although this is only the beginning. Blandness is avoided by the presence of contrast and using the element of surprise. In the design

\textsuperscript{112} Cliff Moughtin, Urban Design: Street and Square, Butterworth-Heinemann Ltd (Oxford 1992) 58
\textsuperscript{114} Cliff Moughtin, Urban Design: Street and Square, Butterworth-Heinemann Ltd (Oxford 1992) 58
of the buildings, the contrast is derived from differences in material, schist and concrete – both in texture and colour. It is also formed in the difference between the curved line (arches) and the straight line and the tension between horizontal and vertical lines. Contrast in the campus as a whole has been achieved by the contrast between the formal and informal on the site. That is, the differentiation between the man-made and the the natural.

Whatever the form of the contrast, the main lines of the building or the townscape should produce an effective whole with all elements imbued with a similar quality. That is, for example, either the window or the wall should dominate the façade\textsuperscript{115}.

It is preferable to have complete clarity so that contrast can be achieved with harmony. For example, in the use of simple shapes, a square should always be a square, not a rectangle, an ellipse should not be a circle with a bulge, but should maintain its ellipse shape unequivocally. This kind of clarity makes the contrast sharper. “Whenever there is a juxtaposition or clash in two information networks, the mind seeks to establish an orderly relationship. When it succeeds, there is a basis for harmony, when it fails there is dissonance”\textsuperscript{116} Thus, achieving this contrast is of utmost importance. The proportions of the contrasting elements must act as a foil rather than compete. To help achieve this, the golden section can be useful. The bigger ratio (1.6) is dominate, while the smaller proportion (1) is big enough to hold its own. There is no uncertainty in this relationship, but it is very difficult to achieve: What is the apparent ‘weight’ of the design elements? The detailing, the colour, the texture, the fenestration and every other part of the facade.

\textsuperscript{115} Ibid 59
\textsuperscript{116} Ibid 59
**The Design Process – The Library**

First attempts at designing a centralised library. The design constrains at this stage was the initial concept of a dome at the end of a vista. Paired columns on public buildings was another constraint, as were the materials to be used (schist and concrete).

<table>
<thead>
<tr>
<th>Image 1</th>
<th>Image 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Initial concept sketch of the library and the main axis." /></td>
<td><img src="image2" alt="Initial concept sketch of the library and the main axis." /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Image 3</th>
<th>Image 4</th>
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</thead>
<tbody>
<tr>
<td><img src="image1" alt="First design of the library. Choice of facades" /></td>
<td><img src="image2" alt="First design of the library. Choice of facades" /></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Image 5</th>
<th>Image 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="A centraised library that was designed using two axes (main axis, an the northern axis) Very difficult to resolve." /></td>
<td><img src="image2" alt="A centraised library that was designed using two axes (main axis, an the northern axis) Very difficult to resolve." /></td>
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<thead>
<tr>
<th>Image 7</th>
<th>Image 8</th>
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</thead>
<tbody>
<tr>
<td><img src="image1" alt="Straightening the northern axis, but keeping the dome as the termination point of the axis." /></td>
<td><img src="image2" alt="Straightening the northern axis, but keeping the dome as the termination point of the axis." /></td>
</tr>
<tr>
<td>Design of a library around terminating three axes: the main axis, the northern axis and a more private courtyard.</td>
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<tr>
<td>------------------------------------------------------------------------------------------------------------------</td>
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<tr>
<td>Revision – resolving spaces formed by the straight edge and the circle.</td>
<td></td>
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<tr>
<td>Resolving the interior spaces of the triangle and the circle.</td>
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</tr>
<tr>
<td>Facade study showing two forms the library could take</td>
<td></td>
</tr>
</tbody>
</table>
The Design Process – The Gym

Early design of the gym with 50m swimming pool and squash court wings.

Facades of the early design.

Top story floor plan of the early design. Designed at a scale of 1:200

Ground floor plan of the early design. Designed at a scale of 1:200

Facade Studies of the gym without the pool or the squash court wing. This facade inspired by Edwin Lutyens's use of rustication.

Facade study
The Design Process – The Accommodation

Early design of an accommodation block.

Revision of early design.

Early concept of an accommodation block – 8 autonomous units per block centered around a courtyard. A good design that unfortunately wasn't nearly dense enough to be able to be used on the campus. It was from this design that foresaw the courtyard designs.

Designs of the accommodation blocks lined into the hill. Note the private garages on the ground floor.

Facade and Plan study of the accommodation.

The accommodation is designed to allow for maximum facade use for each unit with corridors in the centre. In the middle 5 bays are the entrances on the ground floor with lounges above.
The functional requirements of the main hall: the mail hall houses the main administration part of the university, the big reception hall (or ballroom) and a more informal space (bar, cafe etc). Subsidiary space off these are toilets, and a kitchen and storage spaces.

When designing the main hall, the first consideration was the relationship that the hall has with the main plaza. An elliptical main entrance with steps leading up to it and a loggia are the best ways to achieve this.

The next design decision is the relationship between the entrance hall and the main ball room.

Revision – entering the main on the long axis. Perhaps too formal an entrance.

Another consideration is the relationship between the entrance hall and the administration block. It's important that the way to the administration area is off the entrance space. That is, not a separate entrance.

Revision – note stage to the right. These spaces are too big.
Designing the informal space under the ballroom. Bar under the stage, opening onto courtyards to the left and right.

Revision

Designing the main entry space

Revision with the main hall above the entry space.
Designing the space between the entrance and the main hall.

Designing the hall so the entrance opens up to the outside on the main axis. This puts the hall to the side.

Adjusting the sizes of the spaces. This opens up a courtyard to the south, giving the internal spaces more sunlight and ventilation.
<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
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<tbody>
<tr>
<td><img src="image1" alt="Floor plan of main hall – freestanding columns supporting a single long cross vault." /></td>
<td>Floor plan of main hall – freestanding columns supporting a single long cross vault.</td>
</tr>
<tr>
<td><img src="image2" alt="Final floor plan design of the main hall. Three cross vaulted bays. The centre with the main entrance and a balcony on axis. Spaces to the left and right (not shown) that can synthesize with the facades of the courtyards. The space to the right houses the back stage." /></td>
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<tr>
<td><img src="image3" alt="Sectional development" /></td>
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<tr>
<td><img src="image4" alt="Cross Section of a floor plan facing the stage. Not final design" /></td>
<td>Cross Section of a floor plan facing the stage. Not final design</td>
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<tr>
<td><img src="image5" alt="Long section facing entrance. Not final design" /></td>
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Facade studies
Facade studies.
As far as the urban design is concerned, I believe that it successful in what I set out to achieve, that is, to imbue a sense of community in a liberal arts university. The literature I referred to, in particular Responsive Environments, Town Planning in Practice and Street and Square gave me the tools to actually effect a sense of community through design.

The key to the success of this project lies in the architecture of the buildings. My intention is to completely resolve the main hall, the facades of the library, the gym, the classrooms and the accommodation.

In my opinion, the project would be stronger if it had a bigger technical component, that is if I had explored modern construction methods more fully.

Another weakness in the project is the lack of detail. It would be a stronger project if I had the chance to personally design a classical capital, a frieze or even some other ornamentation.
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