



Singapore Urban Design Studio **Housing for Pearl's and York Hills:**
Five Urban Design Proposals
Fall 1999



Massachusetts Institute of Technology
School of Architecture and Planning

Singapore Urban Redevelopment Authority

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Foreword

Singapore is a Southeast Asian island-state which, despite its limited land area and its lack of natural resources, has managed to transform itself into a thriving modern metropolis and international business hub. The role of the Urban Redevelopment Authority (URA), as Singapore's national planning authority, is to ensure that Singapore continues to develop into a vibrant and attractive world-class city.

This year, we were delighted to be able to conduct a joint Urban Design Studio with MIT's School of Architecture and Planning. Besides giving MIT students the chance to gain new insights and contribute to the planning of Singapore, the studio has been an excellent platform for an exchange of ideas on planning and urban design.

A particularly challenging site was chosen as the subject of this year's study. Pearl's Hill is one of only two urban hill parks in Singapore's Central Area, and as such it forms a valuable natural and recreational resource. Yet its proximity to business and shopping districts and to public transportation nodes makes it a prime area for new high-rise high-density residential development. The main task facing the students was, therefore, to balance the optimization of the site's development potential with the need to preserve its unique character and natural environment.

Under the tutelage of Professors Julian Beinart, Eran Ben-Joseph and John de Monchaux, the students have responded admirably to the challenge and have produced many excellent ideas and proposals for the site. The next step is for the URA to study the schemes in detail and incorporate the best ideas into the development plans for the area.

We are grateful for all the contributions from the MIT professors, the students and the critique panelists in Singapore and Cambridge. We look forward to continuing the warm relationship that has been established between MIT and the URA.



View inside Pearl's Hill Park.

Dr. Tan Kim Siew, Chief Executive Officer and Chief Planner, URA
December 1999



Aerial view of site in Singapore context.

John de Monchaux

Chapter 1: Introduction



(Top) Aerial view of Pearl's Hill Park and reservoir. (Bottom) Aerial view of site.

Background and Brief

In 1999 the Fall Urban Design Studio at MIT's School of Architecture and Planning examined the future of a key site in central Singapore. This report describes the issues to be addressed in the urban design of that site and presents the investigations and urban design proposals for the site that were prepared by student teams.

This studio is the tenth in a series carried out by MIT's City Design and Development group. Each urban design studio has investigated and made propositions about current planning and city design issues in a dynamic urban setting. In recent years, the urban design studios have put forward ideas for strategic areas and sites in Tokyo, Taipei, Miami, Barcelona, Boston and Chandigarh. In each case, these proposals have been based on serious field study followed by systematic exploration of a variety of familiar - and often unfamiliar - propositions about future patterns of place, activity and access.

In this series, the teaching objectives of the studio have been to introduce students from a variety of backgrounds to the issues in cities that can be addressed through good urban design, and to make the students conversant with the bodies of knowledge, techniques and values that must be engaged in that task. Additionally, thanks to the interests of the sponsors of the studio, there has also been a wider public objective attached to the studio task. Typically, this objective has been to stimulate public understanding and debate about a live issue in that city such as a major urban design policy, siting choices for public facilities, or the design and location of a significant transportation investment. The final work of the studios has been published in public brochures and, in many cases, has also been the subject of exhibitions in the various host cities.

This past fall, with the sponsorship of the Singapore Urban Redevelopment Authority (URA), the studio was set in Singapore and it examined the future of a fifty hectare area in the downtown. The site, known as Pearl's Hill and York Hill, is prominent topographically, rising 40 to 50 meters above the general level of the core of the city. The hill's elevation led to the building of a reservoir on the top of Pearl's Hill in the late nineteenth century. The site is bordered on the north by the Singapore River, on the south by Outram Road and the east by New Bridge Road and the Chinatown Conservation area. The Central Expressway crosses the middle of the site. The MRT interchange at Outram Road and New Bridge Road occupies the southeast corner of the site.

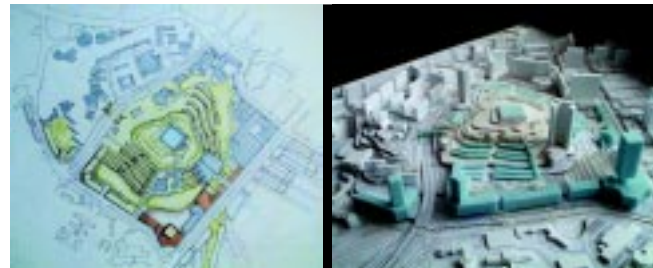
August Sketch Concepts

Over the next twenty years or so, half or more of the site will be redeveloped at much higher densities and its central feature, the Pearls Hill Park and reservoir, is to be enhanced and perhaps reconfigured as an important open space in the city. A brief for the future of the site was prepared by the URA and it provided a starting point for the studio's work. In essence, the URA's goals for the redevelopment of the site are to considerably intensify its use for residential and recreational purposes, to give the entire area a distinct character, and to greatly improve the visibility and accessibility of that part of the site which might continue to serve as a public park.

Studio Tasks and Sequence

Following the assembly and study of background material on Singapore and its recent planning and development patterns, the studio began in August 1999 with a one week visit to Singapore by students and faculty. This visit introduced us to the difficulties and potentials of the site and provided an opportunity for the class to prepare five deliberately different sketch concepts for its future. These sketch concepts were reviewed by a panel of key URA staff and local experts. This immediate feedback gave the class a firm basis for continuing their explorations back in Cambridge.

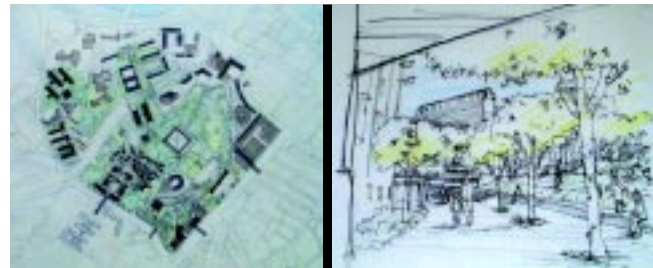
Campus City - This group proposal suggests the possibility of enclosing the site perimeter with a series of high rise housing structures. This allows for an internal park as well as low rise terrace housing sited on Pearl's Hill.



Context City - This group proposal focused on the programming of the site based on contextual conditions. The design ultimately becomes interventions mediating between the park and the surrounding context.



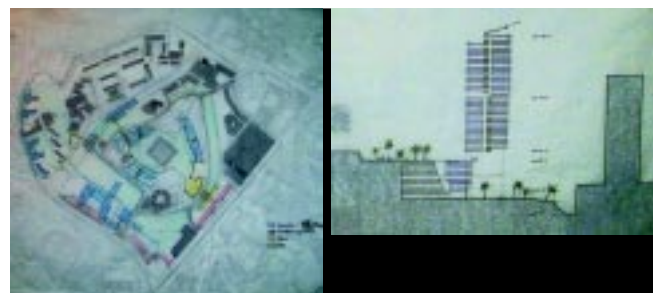
Park City - Exploring the possible relationships between landscape and program, this group proposes a mixture of uses and housing types that are integral to the park.



Link City - Using public transit and visual linkages as a basis, this proposal created high density housing at the existing MRT station as well as a sculptural water tower atop the reservoir.



Matrix City - Seeking to establish an overall order to the site, this group proposed a combination of high rise housing structures and landscape forms based on site specific geometries.



Once back in Cambridge for the start of the semester, the class was re-divided into four new teams for a two-week working period. Each team looked at one aspect of development on the site to enable the creation of a database that would be available to the class as a whole. The aspects examined for the class included:

1. **Housing typologies:** The team studied library references, recent Singapore examples, MIT theses and other sources, and compiled a dossier of high density housing typologies that became a reference for subsequent work in the studio. Site plans and cross sections were presented at consistent scales and were accompanied by a quantitative analysis showing parking ratios, Floor Area Ratios (FAR's), ratio of dwellings per unit of net residential land area, etc. The investigation also commented on the 'fit' of each typology to climatic, market, and other conditions in Singapore.



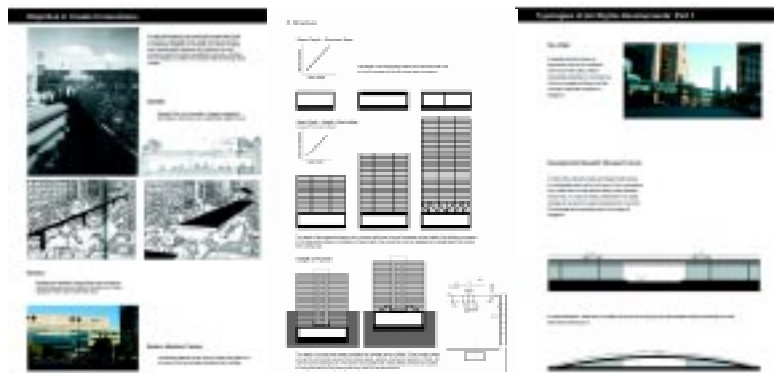
2. **Landscape and Open Space Typologies:** Climatic and cultural imperatives in Singapore suggest distinct, and possibly innovative, forms of landscaping and public open space use. This team surveyed and presented current landscape approaches to be found in Singapore and other similar climatic settings and analyzed these in terms of how they perform as host to the range of activities that the open space on the studio's site might accommodate. The team also investigated and presented precedents illustrating the range of open space uses and their spatial and landscape implications that are likely to be called for on this site.



3. **Site Analysis:** The studio work required a thorough understanding of the attributes of the site and its immediate surroundings. Some of the site issues this group looked at were: topography, slope analysis, views, traffic and transit conditions, wind and sun patterns, parcel areas and aggregate area calculations, function and area of existing buildings, the timing of the availability of each site parcel for new uses, etc. The information was documented and presented by this team in a way that these attributes could be read at the variety of scales later used for model building, overall plan formulation and individual zone designs.



4. Air Rights Opportunities: The site affords – and perhaps demands – opportunities for the development of buildings over the Central Expressway. The site also calls for the effective integration of new and existing development with the transit stations, water channels, and other infrastructure elements on the site. This team investigated and presented examples of air rights development and of the integration of new development with transit stations. The team analyzed these examples and suggested an order of magnitude for the costs likely to be incurred to develop air rights. The team also identified some of the key environmental implications of air rights development.



For the next two weeks, the class turned again to the preparation of overall concepts, this time as individuals. These concepts, illustrating proposed uses, densities and access paths, spanned a very wide range of spatial options and they provided the class with the beginning of a sensibility for the key variables that would need to be manipulated to respond to the URA's brief.

For the following two weeks, the class was once more divided into small groups to examine individual zones within the site in more detail. Thus, by the end of the sixth week of the semester, each student had become familiar with the site as a whole, with a particular zone of the site, and with one of the four general aspects of development studied by the class as a whole.

At this point, four broad land use and design approaches to the future of the site had become apparent in the class. Each approach had merits and each would provide a good illustration of the potential of the site. The key variables in identifying these four approaches appeared to be the configuration, function and amount of space to be devoted to the park, the overall site density, and the extent to which the proposed new built form would create a sense of containing – more as a wall – the site as a whole versus the extent to which the new built form would allow views into the whole site. Based on student interest and on a mixing of skills, four new design teams were composed to work together for the remainder of the semester to develop an integrated urban design proposal.

Team A proposed a park configured to create 'outer' and 'inner' bands of new buildings flanking a ring of new park space on the more level portions of the site. Team B proposed a linear park that links New Bridge Road with the Singapore River and five or six clusters of new housing development. Team C proposed a re-distribution of the total park area into smaller dispersed units of park space which, in turn, articulate a system of relatively uniform housing based on the dimensions and geometry of traditional Chinatown block sizes. And Team D, which looked only at Pearl's Hill, retained the existing park configuration, expanded the park area and introduced new housing clusters that add together to bound the site. The highest overall site densities were proposed by Team B and the most extensive park space was proposed by Team D.

An interim review of each team's proposals was held mid-semester and these ideas along with the commentary at the interim review were shared on drawings and video tape with URA staff in Singapore for their comments. Each scheme was then further developed and presented in the form illustrated in this report during the 15th and final week of the semester in the presence of senior URA staff.

The ideas put forward in this report are wholly the result of the activities and thinking of the studio participants, stimulated by others in Singapore and elsewhere who have thought about these same issues. Thus while the financial support of the URA and the comments and input of participants in discussions with the class have been essential to achieve the studio's results, the views and ideas proposed here are exclusively the responsibility of the class, its students and its faculty.

The remaining sections of this report detail the context of this project and the team proposals. In Chapter 2, Bob Cowherd places this round of planning and urban design for Pearl's Hill and York Hill within the history of planning and physical development in Singapore. The attributes of the project site and a summary of the objectives of the URA for the future of this site are outlined in Chapter 3. In Chapter 4, each of the Teams' proposals are described and illustrated. The report concludes with Chapter 5 which reflects on selected aspects of the student proposals including precedents for this scale and form of urban development, the overall form of the core area of Singapore, the texture and character of streets and spaces suggested by the student proposals, and the role of parking as a component of new development in Singapore.



Robert Cowherd

Chapter 2: Pearl's Hill and the Planning of Singapore



View of highrise at the edge of the Chinatown district.

The intent of this chapter is to set the history of the developments on and around Pearl's Hill and York Hill in the context of the larger history of the forces interacting to produce the planning and development of Singapore. The comprehensive approach employed by the modern city-state of Singapore makes the connection between the larger goals of economic growth and the details of building projects more closely linked than elsewhere.

For Sir Thomas Stamford Raffles, the founding of Singapore was first and foremost a means of striking out against the tyrannies of the monopolistic practices of the Dutch control over Southeast Asian trade by establishing a competing port committed to trade that was entirely free and open. On his first trip back to Singapore three years after its founding, Raffles was disturbed by the chaos of the settlement that had grown up around the mouth of the Singapore River and drew up a plan for its more orderly development. This first plan for Singapore included many of the features that were to characterize the later plans of the newly independent nation. A hill was leveled to provide fill for a low spot along the river making the riverfront suitable for building (the present-day Boat Quay) and, simultaneously, clearing an area for the wharf buildings of Commercial Square (the present-day Raffles Place). In the process, several Chinese merchant houses and a village of some 600 native Malays were relocated inland.¹ The Raffles Plan of 1823 dictated the strict segregation of the living quarters in racially specific districts. This "cantonment" followed practices developed by the British in India and gave a favorable position within the city to the community of Europeans. The Chinese were granted a district adjacent to the waterfront to facilitate their role as middlemen in the trade between the Europeans and native populations of the region. The belief that free and open economic relationships are best fostered through spatial planning and development was a part of Singapore's approach to planning for economic growth from its inception.

Remarkably, the outlines of Raffle's plan were largely adhered to for the next century of Singapore's development despite a rapid increase in population. Singapore's Chinatown swelled in population with only minor extensions of its area as the upper floors of its shophouses were subdivided, and subdivided again to accommodate each new wave of immigration.² Captain James Pearl sold his house and lands of Pearl's Hill to the colonial administration in 1828. New Bridge Road was built in 1840, extending the town to the foot of Pearl's Hill. In 1858, a fort was constructed at the crown of Pearl's Hill. At the



Aerial view of Pearl's Hill Park and reservoir.

same time, Government Hill, on the other side of the Singapore River, was flattened for the new Fort Canning. The general hospital on Outram Road and the police headquarters on New Bridge Road were built in 1882.³ The Pearl's Hill Fort was converted to a water tank in 1898.

Singapore's brief boom as the Pacific Rim geared up for World War II came to a crashing halt with the Japanese occupation, the massive influx of refugee populations, and the destruction by allied bombing. By the time the British returned, 70 percent of the Godown space had been destroyed; roads, utilities and other basic services were severely damaged; and the population had risen from 560,000 in 1931 to 941,000 by 1947.⁴ Rent control was established to curb landlord exploitation of the desperate densities that had developed as high as 2,500 persons per hectare in some places.⁵ Squatter settlements emerged on the fringes of the city. The Singapore Improvement Trust founded in 1924 to solve the housing crisis was largely ineffective against the juggernaut of demographic trends building only 900 units by 1950, many of which were located adjacent to York Hill to the north of the current Central Expressway.⁶ The passive Euro-centric guidelines of the 1955 British Master Plan, if implemented, would have filled the island with semi-detached garden houses and cars. It's predictions and provisions fell far short of the drastic measures demanded by the rapid growth in both population and vehicle ownership that were added to the already desperate situation faced by Singapore.⁷ By 1959 when Singapore became a self-ruling province of the Federated States of Malaysia with approximately 1.5 million inhabitants, fewer than 300,000 people lived in a decent dwelling, around 250,000 lived in degenerated slums and another 350,000 in crude squatter quarters.⁸

The turning point in the history of Singapore came with the 1959 election of the People's Action Party led by Lee Kuan Yew on a platform in which housing and urban renewal were identified as the keys to turning the tide of Singapore's history of misfortune. The primary means of engineering Singapore's turnaround was the establishment of several state-owned corporations with extensive statutory powers of which the Housing and Development Board (HDB) was one of the most important.⁹ Exercising its powers of compulsory land acquisition, the HDB proceeded to relocate slum and squatter populations out of the downtown and demolish vast areas of the city to make way for the commercial redevelopment of the waterfront. Between 1960 and 1965, 54,423 housing units were built, twice as many as in the previous 27 years of Singapore

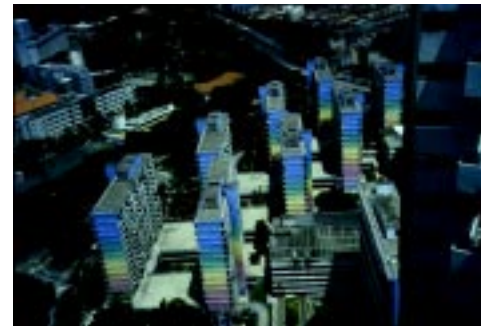
Improvement Trust activity.¹⁰ The construction of bold high-rise residential towers served the additional purpose of projecting an image of growth and confidence to the population of the fledgling nation.¹¹

Two major projects at the foot of York Hill exemplify this process. The first was the redevelopment of the popular People's Park which was actually an informal marketplace set in the heart of one of the residential neighborhoods of the central city. A fire swept through the neighborhood clearing the way for the mixed-use Peoples Park Complex. This was followed in 1968 by the replacement of Outram Prison with the Outram Park Housing Estate which is the largest housing development on Pearl's Hill.

If the 1959 election was its historic turning point, then Singapore's ejection from the Malay Federation in 1965 was certainly the catapult that launched it into one of history's most dramatic and successful stories of deliberate planning for economic growth. Even with six years of successful programs under its belt, the prospect of sustaining the tiny island of Singapore as an independent state reduced Lee Kuan Yew to tears as he announced to the population of the nascent state its sudden independence.¹² The island nation had been stripped of its economic base of natural resources on the Malay Peninsula. This was the defining moment for Lee Kuan Yew and the generative crisis for the people of Singapore that determined what has followed since.

Lee led the People's Action Party to create a dynamic economy with the goal of becoming the strongest magnet in the region for foreign investment. To do so he demanded the near consensus of the nation to achieve and sustain a competitive advantage for the purpose of economic growth. What is striking about the recent history of planning in Singapore is the degree to which this agenda permeates not only industrial, educational and legal infrastructures but also the provision of housing, environmental quality, cultural institutions and the national ideology — each of which have been the focus of planning initiatives.¹³

The Concept Plan of 1971 grew out of the recommendations of a team of planners commissioned by the United Nations. The planners proposed a ring of housing estates (inspired by Holland's urbanized Randstad) surrounding the preserved water catchment area at the center of the island with the Mass Rapid Transit (MRT) line serving as the spine and primary means of transport for the island's population of workers.¹⁴ The fact that "Singapore can claim one of the most efficient transit-land use connections anywhere today"¹⁵ was



Existing Rainbow Housing on project site.



View of Central Expressway.

Existing Housing on York Hill.



achieved by integrating public housing in high-density clusters with the bus and rail network. In Singapore, 86 percent of the population lives in public housing and 74 percent of working public housing residents commute by mass transit.¹⁶ At the same time, Singapore is well served by high capacity roads built mostly during the 1980s. But the transportation planning of Singapore was pursued conscious of the reality that they would not be able to build their way out of road congestion. Automobile usage in Singapore is subject to perhaps the most extensive controls and disincentives in the world.¹⁷

The provisions of the Concept Plan of 1971 are manifest on Pearl's and York Hills most dramatically with the construction of the Central Expressway which was sunk into a trench between the two hills. This was the primary free-way crossing the city and connecting the city to the rest of the island.¹⁸ The construction of the Outram Park MRT station at the already important intersection of Outram and New Bridge Roads contributed to the designation of this area as a Fringe Centre by the URA.¹⁹ But, with the addition of the new North-East MRT line connecting with the existing MRT system at Outram Park Station, the Pearl's Hill area will grow in significance and density.

During the 1970s and 1980s, public housing was built on York Hill as part of the ongoing drive by the HDB to "house the nation." The provision of housing in Singapore was more of a means to the larger end of promoting economic growth and foreign investment than simply a matter of housing in and of itself. Through provisions such as the Land Acquisition Act, the URA's Sale of Sites program, the Central Provident Fund household savings program and the extensive powers of government corporations like the HDB, the Singapore government wields control over both the supply and demand for a substantial portion of the economy. Housing alone, as the largest single land use and the most significant investment of individual households, is fundamental to the economic policies of the state.²⁰

Further revisions of the Concept Plan in 1981 and 1991 built on the previous planning successes and demonstrated a shift in focus from the provision of the basic essentials of housing and infrastructure to enhancing the quality of life, especially for the rapidly emerging middle class. Lee Kuan Yew has proudly characterized the development of Singapore as a succession of increasing refinement of life's opportunities. Having taken care of the basics, Singapore can now pay attention to enhancing the life of its citizens through more sophisticated cultural institutions, recreational activities, and a wider range of material

rewards for the most successful Singaporeans.²¹

The extension of a nighttime entertainment district along the Singapore River led to the construction of luxury hotels that dug into the north slope of York Hill. The fortress-like slopes and retaining walls of the housing developments, roads, shopping complexes and hotels around the base of Pearl's and York Hills were close to completely cutting off the activities occurring on the hills from each other and the rest of the city.

The provision of amenities that became the focus of planning activity in the 1980s and 1990s was strategically linked to the future economic development of the national economy. The family planning programs of the 1970s were suddenly revised in the early 1990s when it was realized that the projected population increase of the nation would leave the economy short-handed. Prime Minister Goh Chok Tong's 1997 National Day speech focused on the need to attract talented foreign personnel to Singapore by creating an attractive, cosmopolitan city.²² The planning of housing has thus taken a deliberate turn towards providing housing types deemed attractive to an international professional class of high-technology workers that Singapore hopes to attract to its shores in support of the growth of its information economy. The "Technology Corridors" planned for the north and south of the island are designed to emulate Silicon Valley and Boston's Route 128 as Singapore competes with Malaysia's Multimedia Super Corridor and similar initiatives in China and elsewhere. The Punggol 21 plan's emphasis on "executive condominiums," "resort lifestyle" and New Urbanist pedestrian and recreational amenities are a part of this re-targeting of housing in support of this sector of the economy.²³

Another indication of the larger agenda driving recent development is the planned massive Marina South extension of the Central Business District. The emphasis of this project is on integrating housing into the downtown while preserving the quality of the environment and residential amenities. It proposes to achieve this by linking housing closely with an extensively developed waterfront edge, substantial park and recreational areas, and the substitution of state-of-the-art mass transit (complete with continuous air-conditioned linkages from home to work) for the deleterious impacts of over-dependence on private automobiles.²⁴ Whether or not this vision is eventually realized in full, it exerts an inexorable force on the nature of current development including the redevelopment of Pearl's Hill area. By offering high amenity luxury condominiums close to the Central Business District, the URA hopes to invigorate a downtown that



View of new public housing in Singapore.

is moribund after dark. The URA would like to foster the kind of cosmopolitan environment projected to appeal to the sophisticated tastes of the coming generation of information professionals that Singapore is trying to attract to its shores in support of economic growth.

Footnotes

- ¹ Ole Johan Dale, *Urban Planning in Singapore: The Transformation of a City* (Oxford: Oxford University Press, 1998), 1-13; and Chua Beng-Huat, *Political Legitimacy and Housing: Stakeholding in Singapore* (London: Routledge, 1997), 28-29.
- ² Chua, 29
- ³ Dale, 16-20.
- ⁴ Dale, 12
- ⁵ Dale, 22; and Chua, 29-31.
- ⁶ L.H. Wang, "Residential New Town Development in Singapore: Background, Planning, and Design," in *New Towns in East and South-east Asia: Planning and Development*, ed. David R. Phillips and Anthony G.O. Yeh (New York: Oxford University Press, 1987), 23-25.
- ⁷ Chua Beng-Huat, *Political Legitimacy and Housing: Stakeholding in Singapore* (London: Routledge, 1997), 32; *Living the Next Lap: Towards a Tropical City of Excellence* (Singapore: Urban Redevelopment Authority, 1991), 8; and C. Abrams, S. Kobe and O. Koeningsberger, "Growth and Urban Renewal in Singapore," in *Habitat International* 5 (1987), 98.
- ⁸ Wang, 25.
- ⁹ Wang, 24-25.
- ¹⁰ Dale, 35.
- ¹¹ Wang, 26.
- ¹² Rem Koolhaas, "Singapore Songlines: Portrait of a Potemkin Metropolis or Thirty Years of Tabula Rasa," in *Small, Medium, Large, Extra-Large: Office for Metropolitan Architecture*, ed. Jennifer Sigler (New York: Monacelli Press, 1995): 1011.
- ¹³ Joseph B. Tamney, *The Struggle Over Singapore's Soul: Western Modernization and Asian Culture*, (Berlin: Walter de Gruyter, 1996): 7-19.
- ¹⁴ Chua, *Political Legitimacy and Housing*, 33-36.
- ¹⁵ Robert Cervero, *The Transit Metropolis: A Global Inquiry* (Washington, D.C.: Island Press, in press), 156.
- ¹⁶ Cervero, 166.
- ¹⁷ Cervero, 155-80; "Living With the Car: No Room, No Room," in *The Economist* 6-12 December 1997, 21-23;
- ¹⁸ Chin Hoong Chor, "Urban Transport Planning in Singapore," in *Planning Singapore: From Plan to Implementation*, ed. Belinda Yuen (Singapore: Singapore Institute of Planners, 1998), 81-132.
- ¹⁹ Fringe Centres are expected to support a certain degree of economic activity removing congestion from the Central Business District and Regional Centres. *Living the Next Lap*, 20.
- ²⁰ Manuel Castells analyzes this role of housing as the key to the economic success stories of Hong Kong and Singapore in *The Sek Kip Mei Syndrome: Public Housing and Economic Development in Hong Kong* (Hong Kong: University of Hong Kong, Centre of Urban Studies and Urban Planning, 1986).
- ²¹ Tamney, 18.
- ²² Dale, 64.
- ²³ "Punggol 21: A Waterfront Town of the 21st Century," brochure produced by the Urban Redevelopment Authority and the Housing and Development Board advertising the exhibition of the Punggol town Development Guide Plan, 1996; and Punggol Planning Area: Planning Report 1998 (Singapore: Urban Redevelopment Authority, 1998).
- ²⁴ *New Downtown: Ideas for the City of Tomorrow* (Singapore: Urban Redevelopment Authority, 1996).

Chapter 3: Programmatic and Site Constraints

Although the four student teams had different design responses, the teams were given the same site and programmatic considerations. Each team created a hierarchy of values that ultimately determined the form of their design proposal. The following list outlines the major programmatic elements that each team was given to address in their proposal.

- Maintain existing overall park area
- Double the amount of housing that currently exists on the site
- Achieve a minimum residential FAR of 5.0 across the site
- Define street edges especially along the major roadways
- Relate design to topography of site
- Integrate new development into the fabric of the city
- Capitalize on strategic commercial and residential development opportunities
- Subdivide the site into 1 to 1.5 hectare plots for release to private developers
- Create a link between Pearl's Hill and York Hill
- Respond to the hot humid tropical climate of Singapore through site design and building form
- Evaluate the existing buildings within the context of the urban design scheme

Additionally, the student teams had to consider local cultural values and norms, like the existing building typologies, attitudes toward landscaping, and transportation demands. The following sections discuss these issues in more detail.

Building Typologies

The need for high-density housing in Singapore has created various housing typologies based on land ownership, population growth, efficiency of dwelling units, and symbolic meaning. The three housing typologies that emerge most commonly are the slab block, the point tower and the dense low-rise typology of the traditional shop-house that is still evident throughout Singapore. While it can be argued that various versions of each housing type can create similar densities, the individual typologies are specific in their contextual usage. For example, small sites are more conducive to point towers and the new housing estates, centered on rapid transit stations, are tall slab block villages organized around pedestrian parks.

In response to the tropical climate, outdoor spaces require shade and open walls to capture breezes. In Singapore, the architectural response to the climate is evident in building forms such as the enclosed podium and the

covered environment at grade that is a public/private semi-enclosed space. In commercial buildings, this base condition becomes an enclosed podium that is air-conditioned and yet still functions as an indoor/outdoor public space. In residential towers, the raised first floor creates a progression of space from public to private that offers protection from the climate and allows social interaction within the covered common space for building residents.

Manufactured Nature

The land upon which these building typologies sit is another condition unique to Singapore. The limited amount of vacant land on the island and the projected population creates a situation where every inch of Singapore eventually becomes a candidate for redevelopment and “nature” can be placed in the most opportune location. As such, the natural environment is manufactured in the location where nature is planned to be and overall planning goals supercede the goal of environmental preservation. This approach toward the natural environment presented an opportunity for student teams to disaggregate the large Pearl’s Hill Park and re-distribute the park area around the housing blocks on the Pearl’s Hill and York Hill sites.

Transportation

Weaving throughout the island of Singapore is an extensive transportation network. From high-speed regional trains to local connector bus lines, Singapore’s mass transit system operates as a model of efficiency to the rest of the world. Contrasted with the extensive mass transit system is the automobile with its pollution, space requirements, and costs. Although Singapore has one of the most restrictive automobile ownership policies in the world, automobile ownership is prevalent. Due to peak pricing strategies, automobiles are mostly used for leisure activities rather than for commuting to work; therefore, parking areas become automobile storage and can be less directly linked to the building function. Some of the student groups used the concept of automobile storage to design parking banks on the site which allow for aggregate parking with public open space on top of the garage.

In conjunction with the mass transit system, Singapore has an extensive pedestrian network; however, the hot humid tropical climate of Singapore discourages pedestrians from walking extended distances and promotes a need for protection from the sun and rain. The Pearl’s Hill site offered an additional challenge to pedestrians since the hill has extremely steep slopes that discourage pedestrian activity. The student teams developed alternative pathways and approaches to the topography to increase access to the MRT and to provide clear pedestrian pathways connecting throughout the city of Singapore.

Conclusion

Given the fact that each student team had the same issues to consider, the individual team proposals have many similarities and yet are unique. Team A organized their scheme around a lower level linear park, Team B created a strong link from the Outram MRT interchange to the Singapore River, Team C developed a design tool to be applied across the site, and Team D preserved the hill as a park and concentrated new development at the base of the hill.