

OPPIDAN URBANISM: TOWARDS A NEW PUBLIC SPACE ON THE WATERFRONT.

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ABSTRACT : Waterfront reinvention continues to be an important part of the redevelopment of many cities around the world. This project offers a way of specifically transforming waterfronts through an understanding and development of different landscape conditions. Through a conscious engagement with a larger realm, environmental and social, a new public realm can be developed for a site that will continue to play an important part in the development of many cities around the world.

KEYWORDS: Landscape Urbanism, GIS, Public Space, and Waterfronts

What a difference it makes if nature, instead of being a huge reservoir of forces and a bottomless repository of waste, turns suddenly into something that interrupts any progression: something to which you cannot appeal and can't get rid of. (Latour, Bruno, 2005).

This paper explores the implications of making new public space on the waterfront by engaging with the natural world through the agency of environmental infrastructure and GIS mapping. Bruno Latour's ideas on the formation of a new public realm are considered in this investigation. The paper describes and reflects on four design case studies; a new public park, a marina, a new passenger terminal wharf, all on the Waitamata Harbour, Auckland, New Zealand, and a speculative housing project in Guangzhou, PR China. The results of this landscape based design process is the development of a new kind of public world that escapes the typological limitation of parks and the conventional waterfront. The projects demonstrate a way in which citizens can engage in a new space that is a structure for social assembly and a re-presented environment.

The harbour edge of water and land, the urban littoral, has become the most sought after and contested sites for urban developments through out the contemporary world. For much of the 19th and 20th centuries, the urban waterfront was a highly polluted heavy industrial zone and scrapheap for the urban detritus of global urbanization. Over the last 30 years, however, this industrial infrastructure has been transformed by a new kind of industry, one based on personal consumption.

The first manifestation of this new economy, the Waterfront, is commonly held to be the Baltimore Inner Harbour, begun in 1980. The original industrial waterfront, abandoned by the commercial port with the advent of containerisation, became a massive real-estate development opportunity. The construction of the Baltimore waterfront started with the building of the HarbourPlace mall. This was followed by the construction of public and private buildings, museums, parks, hotels, and a marina, along a continuous promenade. This model of waterfront development, the public/private partnership, the treatment of water as a passive spectacle, the sequencing of a chain of public amusements both permanent and temporary along a promenade has become a formula for subsequent waterfront development. The character of this assemblage has remained surprisingly unchanged over thirty years, repeated in almost every major city in the world, even in towns that lack a waterfront, the ubiquitous Port Town (Koolhaas R. & Mau, B. (1995) has miraculously emerged. However the relentless success of this urban typology, the curious placelessness of each development, regardless of locale, the privatised nature of the 'public space', the urban types; promenade, square, courtyard, all embedded within various surveillance regimes, and the elided problems of the contaminated landscape underlying each waterfront development, have all lead to a number of critiques.

The work of Bruno Latour, (although not directed specifically at waterfronts), can help us think about the composition of a contemporary public world. Latour describes the deficiencies in the traditional means

that the public is represented, the parliaments of the world. In their place he points towards a multitude of ways of assembling, a world of space not time. Public space must now accommodate all the different types of assemblies that we make for ourselves from the most banal and humble to the important. These assemblies are not just our social worlds but also matters that concern us, the environment, the diversity of species, the pollution of waterways. We represent these assemblies as a multitude rather than a unitary whole. The question that Latour poses for us is 'how many contemporary elements can you build side by side, generating a series of simultaneities' (Latour, Bruno. Weibel, Peter. (2005).

By engaging in an obdurate 'nature' we are forced to invent new kinds of public space. In refocusing on the waterfront through the lens of the environment, we see a highly contaminated landscape. In many harbours, untreated and heavily polluted stormwater often enters the harbour where highly visible and toxic plumes can be clearly seen. The other major site contamination on many waterfronts is polluted marine sediment, the legacy of many hundreds of years of antifouling and other ships industrial detritus lying on the seabed.

Given the importance of such serious environmental problems, with what techniques might we start to develop public assemblies that both acknowledge the conditions yet avoid the generic design solution found in all too many waterfront spaces? Developing an original design methodology based on a study and privileging of existing landscape conditions could be a start in developing such a process.

To rethink the waters edge as a landscape necessitates the development of a process that starts with an analysis of the site. We can often find three landscapes in many waterfronts cities; the first, the existing topography, flat or raised, natural or reclaimed. The second, the hydrological landscape of freshwater, stormwater, and saltwater, governed by tidal movement and rainfall. And the third, the historical landscape of native ecologies. To make these landscape visible necessitates finding a way to represent them, their possible manifestations and any congruencies with environmental operations. Using a GIS programme, ArcView, helps redraw the waters edge as topography, both terrestrial and submarine. From this terrain other maps can be developed; aspect, the direction that the terrain has to the sun, hill shade, what parts of the terrain are in shade, slope, where the steeper and shallow slopes exist, and hydrological, where overland flow paths occur.

This analysis revealed a fundamentally different view of the landscape and city than that revealed by conventional urban design systems. Reconceptualising the landscape and city as something larger than building and the spaces they enclose, opens up a process that can fold in complex social and environmental issues that are often elided in more conventional analysis and design.

The following four case studies demonstrate the different possibilities that these processes open up, faced with different sites and programmes.

CASE STUDIES

Shore Road Reserve, Remuera, Auckland, New Zealand. 2003

The case study is a two hectare grassed reserve located on Hobson Bay to the east of the Auckland CBD. The reserve, on the southern foreshore of the bay, is bounded by existing playing fields on the western side, a busy road to the south and a stream to the east.

The site is a reclamation, it was a dump for construction fill from the building of an underground carpark in the centre of Auckland during the early 1970s.

In developing the project we considered the programme, improving the drainage of the site, and linking the reserve with the adjoining sports fields and the waters edge.

The original grading of the site was poor finished, it was badly compacted and falls in different directions, causing water to pond on the site. Consequently the site is very boggy in winter making it difficult for the public to use the reserve, especially along the waters edge.

In starting the site development we built a DTM of the whole catchment, situating the reserve within the larger drainage catchment system, bounded by the Victoria Avenue, Remuera Road and Parnell Road ridges. Defining the DTM helped in running hydrological tests, notably for overland flow paths and tidal variations. This analysis revealed the patterns of water flows over the site, showing surface water movement towards the road rather than the coastal edge that has lead to flooding in winter. The tidal analysis also demonstrated flooding within the catchment especially along the edge of the bay and reserve. The

hydrological analysis helped to develop a design solution to both the existing environmental problems and the social concerns.

The proposed design for the reserve provides a long term, environmentally sustainable solution. The design proposes recontouring the site into two parallel 'ridges' running north/south. These ridges have a 2% slope down to three 'gullies'. Two of the gullies are constructed as swale systems leading to the coastal edge. One of the swales runs along an old water channel, thus solving the health and safety issues associated with ponding and the problem of rampant weed infestation in this area. The coastal edge is re graded from an elevated walkway on top of a low sea wall to a gentle slope into the tidal zone. This buffered zone is planted with native macrophytes along the coastal margin. The site can now drain naturally; the higher areas of the reserve can accommodate an all weather path network. The project will greatly improve the ability to maintain the reserve while providing a planting scheme those functions as a buffering zone and reflects the coastal environment.

The tradition coastal park maintains a distinct separation of the park users from the sea edge through the use of retaining walls. The adjacent terrestrial world has its own particular brief, sports ground, recreation users, the promenade, all separate from the 'natural' world of the sea. This early project aims to break these traditional typological and social barriers by reconsidering the site as a greater entity, beyond its simple boundaries. The reserve is seen as a fragment on which greater hydrological forces; stormwater and tidal salt water, play out there respective functions. The terrain is molded to both reveal and facilitate the efficacy of the hydrological actions, the site demonstrates the play of these deep forces. The social consequences of this new terrain are a new way of moving through the site, no longer are the park users passive observers, the paths across the site vary according to tide and season. The coastal planting is a restoration of the fragile native sea meadow that where once a common coastal edge in Auckland now, almost all of the meadows have vanished.

Beixing Housing Development Guangzhou Province PR China, 2002-2003.

The case study is located on a lake in the hills, near Beijing, Guangzhou, the People's Republic of China. The site is a small inlet on the western side of the lake; the orientation of the bay is roughly north/south. The programme called for the design of five houses and gardens of different scales and sizes, starting with a three bedroom family homes to a very large mansion with conference facilities

In developing the project we started with the gathering and ordering of important site conditions, the overland flow paths, the aspect and slope of the site, all of which helped to determine appropriate areas of the site in which to position the buildings. It was important that the house sites were conceptualized as 'occupation zones' rather than as autonomous objects. Because of the closed nature of the artificially dammed lake, it was critical that the excavation and the subsequent danger of soil run off were kept to a minimum. Areas of the site with a low slope ratio that would require the least modification of the terrain were selected and formed into a series of low terraces, staged down the slope and interleaved with the existing topography. These terraces became the occupation zones: the terraces nearest the road became entrance areas; the central terraces, the private area of each of the houses; and, the lowest terraces by the lake, became the living and entertaining zones. The areas between the terraces were treated as conservatories to be planted with species similar to those in the surrounding gardens. The platforms were covered in such a way to cause least disturbance to the site's natural drainage pattern, the shape of the building roofs duplicated that of the unmodified terrain below.

When considering the landscape possibilities of the site, the first consideration was the climate. While the site is on the edge of the tropical/subtropical climate zone it still receives the yearly monsoon, the design had to ensure that the overland flow paths remained unobstructed. We proposed that the flow paths were excavated and laid with riprap beds. In the rainy season they would efficiently drain the site, in summer they would resemble dry rivers.

We proposed that the horticultural site be densely planted with native Chinese plants of types and species determined by the site conditions. Interestingly those very species that are commonly conceived of as 'exotic' in the West ; bamboo, magnolias and camellias, are actually indigenous to the Guangzhou province, where the first 'exotic' plants from China were exported to the west. (Chapman, G. P., & Wang, Yingzheng (2002) Valder, P. (2002)

We suggested making a complex system of paths to run through the site, from the road to the lake, through gardens, along-side and across the streams and through the houses and conservatories, establishing a complex 'plaid' pattern of paths, linking the properties to each other and the gardens.

This project demonstrated that new forms of urbanism could be generated by the intentional use of landscape techniques - considering topography, exploitation of natural forces, and careful horticultural selection to determine the overall form of development.

The project also demonstrated the limitations encountered when trying to use separate typological definitions and hierarchies such as, house, garden and nature. These descriptions limit exploration and possibilities. In this project, the garden is both exotic and indigenous; paths are both movement systems and connections breaking down traditional property boundaries; streams are both overland flow paths and rockeries, and houses are more like living zones, with a range of occupational choices, rather than autonomous objects.

The idea of the lakefront is expanded from a passive domestic spectacle to a living ecology with a deep connection to the terrestrial hinterland. The formalised primacy of these hydrological systems have helped to generate new site relationships; social connections to 'nature' the indigenous garden, water systems and to the other occupants of the site.

Bayswater Marina, Bayswater, North Shore City, New Zealand. 2008

The case study is located on the northern side of the Waitamata harbour, Auckland. This area is indented with several flooded river valleys extending inland, the Lucas and Oruamo Creeks and Shoal and Ngataranga Bay. The coastline is sheltered, with extensive areas of shallow water and tidal flats. The Bayswater Peninsula separates Big Shoal Bay from Ngataranga Bay. Like other peninsulas along this coast, it is characterised by a relatively flat topography along the ridge top, exposed sandstone cliff faces, pohutukawa clad coastal escarpments and typically one and two storey residential developments.

At the end of the Bayswater Peninsula is O'Neill's Point. The Bayswater Marina is located on a four-hectare reclamation at the southern tip of the point. Seen from the south and east, the reclamation, with the marina beyond, appears very similar to a rocky shelf or volcanic reef extending out from the shoreline, much just like other reefs found around the Auckland coastline, such as Meola Reef.

There are several use zones within Bayswater Marina; these areas coincide with the construction of different reclamations. The original reclamation forms the eastern side of the Bayswater Marina; it comprises a long narrow finger of land extending from the existing cliffs. It is distinguishable from the new reclamation to the west through height difference, it is approximately one metre lower, and the maturity of the existing pohutukawa trees. Public transport, bus and ferry, occupy the end of the reclamation, connecting to Ngataranga Bay. The larger and newer reclamation lies immediately to the west of the original reclamation. The northwestern corner of the main reclamation is occupied by a haul out, boat repair and storage area. Car and boat trailer parking occupy most of this site. A small-grassed park with young Pohutukawa and Norfolk Island pines is located on the southeast coastal edge of the reclamation. The marina lies to the west of the reclamation. It comprises 7 finger pontoons contained within an encircling breakwater and provides approximately 400 berths for boats of various sizes. A public boat ramp is located on the south-eastern corner of the main reclamation, parallel with and to the west of the ferry wharf.

The programme for the site was to develop the whole marina as a community and marina-orientated place with a focus on recreation, public transport and boating activities. The design had to acknowledge the sites position within the Waitemata Harbour, preserving the existing environment, protecting views and ensuring public access across the whole site. The design also had to conform to the following criteria;

The environmental quality of the area must be improved as a whole by any new layout or distribution of activities. The location and design of buildings, and associated landscaping, must not obstruct important sightlines and vistas to and across the Harbour. The area must maintain a spacious quality rather than a built up one.

In developing the project we proposed a process based on a landscape generated urbanism that would allow for; an open space structure in which the public can actively circulate, a sufficiently elastic structure to accommodate new traffic infrastructure, community activities, boating activities, recreational activities and buildings that can be part of the landscape experience, such as cafés or restaurants.

To understand how these could be placed in the most efficient relationship with each other and the site, a diagram was generated to demonstrate how the different activity sets could relate to each other, the site and the larger landscape.

The marina activity group could be placed on the western edge of the site, marina maintenance activities situated to the north, existing marina car parking located in the centre, and ancillary marina activities located in the maintenance area and alongside the marina car parking. This activity set connects directly to the existing marina, through the recreation zone. The public transport activity group: bus terminal and ferry terminal could run along the eastern edge of the site. The boating activities group, trailer parking and the boat ramp can be located between the public transport and marina activities. They could occupy the middle of the site and connect to the harbour to the south. The community activity group could be located near the existing boat ramp. The recreational activity group wraps around the other activities and fills up the interstitial space of the diagram, emphasising the way in which the recreational/public space is the urban glue that both holds the other activities together in a coherent ensemble and mediates between the outer world of Shoal Bay and the reclamation site.

To understand the larger dynamic landscape conditions, GIS mapping was used to establish the location of existing overland flow paths and conjectured native planting zones. However any desire to environmentally rehabilitate the reclamation has to be subsumed by the pragmatic demands of the site, especially by the marina. Similarly the creation of a 'pure' park solely dedicated to recreational use and the enjoyment of nature is untenable because of the private ownership of the marina site. Rather the design proposal is for a hybrid park, one that responded to the requirements of the community the stakeholder and environment. This hybrid park is a landscape based urban design that is both private and public, but connected by an open, flowing and indivisible public space.

The proposed design starts with the marina, the most important activity on the site. At the north end, a variety of boat maintenance activities are allowed for, including; a haul out area, a boat storage rack, an area for boat servicing, and a wash down area. The boat stack, a two level rack, is placed along the access road. This utilitarian structure is concealed. A forklift with a reciprocating lift, would be used to access the boats in the stack, and with the provision of a concrete retaining wall in the marina revetment, deliver the boats to the harbour.

The maintenance area is connected to the public realm by being visually permeable on three sides. The foreshore yard running around the northern and western sides of the zone enables the public to see the maintenance activities and boat launching.

The existing marina car parking (315 parks) is reconfigured to allow for the provision of the 15m-foreshore yard, public parking (44 parks), and access to the pavilions in the foreshore yard.

Rebuilding the parking bays with a permeable cell structure mitigates the environmental issues of the large areas of existing parking causing excessive stormwater run off. Depressing the level of the parking space below the level of the public space, especially the foreshore yard, ensures that any site run off is collected by the permeable car parking. The runoff is drained to the southern end of the site where it runs through two constructed wetlands, before discharging into the harbour.

The existing boating activities; trailer launching and trailer parking, are left in the same area, with some rationalisation. A similar stormwater collection is used; with the parking areas reconfigured as permeable surfaces. Tree planting helps break up the monotony of the parking area. The drainage from the car park is directed into a constructed wetland that drains into the harbour.

A 15m-foreshore yard around the reclamation accommodates most of the recreation programme, picnicking, barbecuing, visiting the café and restaurant, walking along the promenade, and using the playground. The foreshore yard gives the public the best connection to the marine environment. The design of the promenade, its materiality and topography, changes according to the orientation of the landscape. Along the marina edge, a curving timber boardwalk with native planting and a mounded topography is installed; this form is a transition from the marina revetment to the car parking. The design of this zone emphasises the views out to marina and harbour beyond, and conceals the existing marina car parking.

At the southern end of the car parking, wetlands are installed to treat contaminated run off. These are planted with bands of native reeds descend in a series of steps to the waters edge. Sea water and polished stormwater are allowed to mix in this intertidal zone. Pedestrian bridges run across the wetlands enabling the public to connect to the environmental cleaning processes. Other parts of the foreshore yard are extended to the sea edge to provide viewing platforms. While it is critical that the foreshore yard forms an important and

effective public space around the reclamation, it is equally important that the public can use the interior of the site safely and in a manner that connects all the disparate activities of the site. Two landscape 'bars' run through the centre of the site. The strips provide a way of moving pedestrians safely from the northern to the southern end of the site. The strips also have the effect of separating the parking areas; the trailer, public and marina parking.

The building programme associated with the marina (chandlery, retailing/hire/brokerage, offices, clubhouse, and staff accommodation) is spread between several buildings located along the western edge of the site. The building programme associated with recreational activities (changing rooms, cafés and restaurant) is partially located in the western foreshore yard. They are treated as pavilion like structures, of a small scale and built from sympathetic materials so that they do not dominate the landscape nature of the foreshore yard. The planting on the esplanade is native trees, mostly Pohutakawa.

The building programme associated with community activities, the rowing club, and other non-profit marine related clubs are also located in the centre of the site. This has the practical advantage of being able to utilise the trailer parking during the week and evening and gives close access to the public boat ramp. At the southern end of the site, a tower like structure is proposed. The tower is five stories high, and has a 'Z' shaped profile. Shops are contained on the ground floor with a lookout/restaurant on top floor. The tower is connected to a two story building supported on pilotis, approximately 700m², with open parking on the ground floor.

The marina is perhaps one of the most conservative and 'private' of all waterfront types, rigidly conformed to the pragmatic programme of boat storage, maintenance and car parking. This traditional type offers little to the citizen beyond a grudging admittance. Yet this project shows that this seemingly rigid assemblage is susceptible to the forces of the larger environment through remediation techniques. The typical marina car park massive and oversized can be transformed through subtle topographical deformation into rainwater collectors and flow paths that redirect any contaminated water away from direct entry into the harbour. Public space, wherever it is located and however vestigial it may be, can be treated in a common manner. This includes a common material vocabulary, and a common planting of indigenous species. The establishment of a pedestrian path network can help to link all part of the site, both private and public. The building programme, while responding to pragmatic requirement is formally and spatially receptive to both the local condition, evidenced by the proposed pavilions in the park, and the larger landscape of the harbour, as expressed in the periscope tower on the southern end of the reclamation.

Queens Wharf Passenger Terminal, Auckland, New Zealand. 2009

The Queens Wharf is a critical site on the Auckland Waterfront. In the 19th century, the wharf formed a contiguous surface with Queen Street, Auckland main street, acting both as an infrastructure link to the interior of New Zealand for the export of raw materials and as an ingress of manufactured goods from England. It was also the cities social space, as shown by the presence of innumerable strollers and layabouts in almost every image from that period. (Bush, G. W. A. (1971) The connection was later subsumed by the critical cross-town flow of the newly reclaimed Quay Street and Customs Street and the closure of most of the wharf to the public by the Ports of Auckland.

However the southern end of Queens Wharf still has a busy social programme. Starting with the arrival of commuters on the cross harbour ferries at eight thirty in the morning, the space at the intersection of Queens Wharf and Quay Street is busy with officer workers at ten, twelve and three o'clock. The commuter rush starts again at five pm. At night the waterfront becomes a party zone with thousands of teenagers descending on the waterfront, in particular the bars and restaurants of the adjacent Princess Wharf and the Viaduct Basin.

Queen Wharf is also a highly contaminated landscape. Untreated and heavily polluted stormwater enters the Waitamata from the fifty-two hectare Queen Street catchment as can be clearly seen after heavy rainfalls. Polluted marine sediment is the other major site contaminant a historical legacy from over one hundred years of shipping.

The wharf was recently sold by the owners, Ports of Auckland to the Auckland City Council and Auckland Regional Council. The new owners have developed a design programme for the wharf. The outcomes are three fold; a public space for all Aucklanders, an overseas passenger terminal for the large cruise ships that visit Auckland every year, and a temporary 'party zone' for the duration of the 2012 Rugby World Cup.

In developing the project we initiated the design process by;
Mapping the existing and conjectured landscape conditions, the existing topography, the overland flow paths, the aspect and slope of the site, using a GIS programme, ArcView.
Constructing a design process using GIS techniques to both represent landscape conditions and model future development and interactions.
Privileging the landscape over other possible conditions such as architecture or conventional urban design.
Intersecting mapped landscape conditions with environmental remediation techniques.

To understand how to remediate the contaminated stormwater and polluted marine sediment we investigated a number of remediation techniques. One of the best-accepted practices for cleaning contaminated marine sediment and contaminated fill is to use phytoremediation. This is a process where plants are used to remove harmful chemicals from polluted ground. Firstly existing marine sediment is dredged and collected. *Salix* and *Populus* species are then planted in the contaminated fill, certain pollutants are drawn into the trees system, gradually removing the harmful contaminants (Rock, 2001) (Dickinson, 2004).

The remediation of contaminated stormwater is a better-known process. Stormwater is collected and cleaned through a number of processes including filtering through vegetation, to remove harmful pollutants before being released into natural watercourses, streams, or the sea (Shaver, 2000)

The next stage of the project was to map the intersection of the existing landscape conditions found through GIS mapping, with ecologically timed remediation processes, to generate a new landscape based development strategy.

The slope diagram is analysed, the steepest areas are 'buffered' or enlarged. These areas are identified as places where dredged marine sediment could be located; some of these areas are on land, some on man made structures like wharfs, some on the actual sea bed. The areas located on the seabed can be built up by using existing reclamation techniques, mixing dredged marine fill with cement to form a stable platform above sea level. Further dredged fill can be placed on top of this platform. All the areas where the dredged fill is placed are planted with *Populus* and *Salix* species, after two years these trees are gradually harvested and replaced with indigenous species from the local coastal cliff eco tone including; Pohutakawa, *Metrosideros excelsa*, Karo, *Pittosporum crassifolium*, Taupata, *Coprosma repens*, Houpara, *Pseudopanax lessonii* and *Astelia banksii*. (Morton, J. A. C., Ewen. (1993)

The overland flow path maps are combining with the existing exit points for the stormwater of the CBD catchment area. This map points to the possible location of stormwater remediation treatment areas. The area necessary for the treatment of the stormwater is formed by the deformation of the existing reclamation and by the formation of 'atolls' through the construction of the phytoremediation terrain. Behind this new topography, the seabed of the 'lagoon' is raised to form a sloping gradient from the stormwater outlet to the sea. The lagoon is constructed to allow for the standard remedial stormwater treatment using indigenous wetland planting such as; Raupo, *Typha orientalis*, *Baumea articulata*, and *B. rubiginosa*. The 'atoll' wall is shaped to allow the natural tidal flows to enter to both flush and receive the polished stormwater.

It is within this new landscape that opportunity for developing new building programmes can occur. We developed a building programme, which we named the Mountain, by mapping the new social movement patterns that have developed through the new landscapes and the new social programmes engendered by the Rugby World Cup and the programme for a new Cruise Terminal. The mountain is a multi use structure that accommodates the new movement patterns, north/south, from the city to the end of Queens wharf and the movement patterns across the new phytoremediation atolls. Access from Queen Street to the end of Queens Wharf goes under the Mountain. The desire to swim in the newly cleaned harbour leads to a topographical deformation at the end of wharf to form a 'beach' allowing swimming and water based activities.

The Mountain can also be used as a terminal for overseas cruise liners. Passengers who arrive at the port need to move smoothly and rapidly into the city. The upper levels of the Mountain can be used as customs clearing facility before the passengers descend to Queens Wharf, and crossing Quay Street, enter the city.

Queens Wharf is to become Party Central for the 2012 Rugby World Cup. The waterfront will become a dense throng of clubbers and partygoers, moving from bar to bar, club to club. The Mountain can provide a party infrastructure for the big games, big screens, sound systems, bars, and toilets.

The dense matrix of big screens inside the Mountain that were used for the World Cup can become the 'walls' of a new gallery of digital art. Especially commissioned video works can be screened every week; overseas visitors are greeted by the best work of New Zealand artist.

The Queens Wharf project demonstrates that it is possible to move beyond the current 'waterfront city' design paradigm, the generic model where an architectural framework borders a limited typology of public space.

The rich yet practical forces that were discovered and explored in the GIS mapping can move beyond a pragmatic process, by considering the changing world of ecological processes and remediation strategies. Here the richness of an environmentally based urbanism flows into a similarly richly phased social programmes to produce a wide range of social and economic outcomes.

The project offers a complex range of unexpected yet real connections between such disparate subjects as buildings, ecological cycles, indigenous flora, and urban life. The project creates an opening into these seemingly autonomous worlds, allowing them to percolate into each other. The results are strange, unprecedented and open to further change and development.

A unique urbanism is developed which eschews the traditional waterfront planning of Europe and North America. Moving beyond the limitations of the conventional fixed master plan, the Queens Wharf project, proposed a fluid development strategy that responds to the deep movements of both tide and stream.

REFERENCES

- Chapman, G. P., & Wang, Yingzheng (2002) *The Plant Life of China*, (Munich) Springer.
- Bush, G. W. A. (1971) *Decently and in Order*, Auckland, Collins Bros. and Co.
- Dickenson, N. M. (2004) Modelling Contamination in an Urban Canal Sediment. In Wong, M. H. (Ed.) *Developments in Ecosystems, Vol. One*.
- Fortune, R. (1847) *Three Years' Wanderings in the Northern Provinces of China*, (London) J. Murray.
- Koolhaas R. & Mau, B. (1995) in Sigler, J (ed.) *S,M,L,XL*, Koln., Germany: Benedikt Taschen.
- Latour, Bruno. Weibel, Peter. (2005). *Making Things Public. Atmospheres of Democracy*. Pg 40. ZKM|Center for Art and Media, Karlsruhe, Germany.
- Morton, J. A. C., Ewen. (1993) Shore Vegetation. In Morton, J. (Ed.) *A Natural History of Auckland*. Auckland, David Bateman Ltd.
- Rock, S. (2001) Phytoremediation: intergrating art and engineering through planting. In Kirkwood, N. (Ed.) *Manufactured Sites*. London, Spon Press.
- Shaver, E. (2000) Low Impact Stormwater Management (TP124). Auckland, Auckland Regional Authority.
- Valder, P. (2002) *Gardens in China*, Glebe, NSW: Florilegium.