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To study water sensitive urban design and sustainable environmental systems in landscape architecture

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Precis and Acknowledgments

This report details some of the landscape architectural and urban design concepts experienced during a 2002 Churchill Fellowship visit to Sweden, Germany, Netherlands and France. Specific areas of study included

- water sensitive urban design in commercial landscapes
- water sensitive urban design in residential landscapes
- biological and mechanical stormwater treatment methods
- preservation of indigenous vegetation within urban environments
- innovation in erosion control and other environmental practices

My visit to Europe and the invaluable experiences I gained would not have been possible without

- the financial assistance given to me by the Winston Churchill Memorial Trust. In addition to financial support the high regard of Churchill Fellowships helped me make contacts with many exciting and interesting professionals within many fields.
- the support and commitment of my employers and friends at Nillumbik Shire Council, for ensuring their staff have the opportunity to develop and extend their professional expertise
- my family and friends, especially Jason Hough, for their support and encouragement throughout the whole experience.
EXECUTIVE SUMMARY

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To study water sensitive urban design and sustainable environmental systems in landscape architecture, through investigation of alternative stormwater treatment, pollution control and erosion mitigating technology within dense urban sites

Fellowship highlights

1. Indigenous Vegetation in Urban Environments Conference, Uppsala Sweden, a five-day seminar established by SLU University. Established contacts with landscape architects and horticulturists from all over Europe, whilst visiting numerous exemplary sites.  
2. Hammarby Sjöstedt, Sodermalm, the newest urban residential housing development in inner Stockholm where the focus is on water, and ecological sustainability  
3. Potsdamer Platz, Berlin, water sensitive urban design in the heart of a new commercial city center. Stormwater retention and treatment in a highly urban area.  
4. High-density suburban residential and commercial development on the Kronsberg, Hannover. Extensive use of swales, bio-retention and small scale wetlands  
5. The whole city of Essen, which included the most innovative and exciting reinvention of the concept of parks and recreation. The region included highlights such as Duisburg Nord, Zollverein, Schungelberg Estate and the Akademie Mont-Cernis, Herne-Sodingen

Findings

The quality of life for the residents of each of the individual cities I visited on my tour was explicitly evident through the urban landscape. Access to parks, cooler microclimates, clean water for swimming, inspiring cultural activities, innovative outdoor museums, and the presence of aquatic plants in urban waterways, were all key indicators I searched for. And it was the reinvention of German cities in the last 20 years that offers Australia the most relevant examples of innovation in water sensitive urban design and landscape architectural design.

Significant urban ecological improvements come only through large government initiatives of reinvention, such as the International Building Exhibition in Essen in 1989-1998, Expo 2000 in Hannover, Apartheid in South Africa, and currently the preparations for the Commonwealth Games in Melbourne. Profound change is required for water sensitive urban design to go beyond isolated projects, and I was amazed to find innovation was not as prevalent in Europe as I imagined. Only when ecology is intrinsically linked as a benefit to future economic growth and tourism, and more importantly to an improved and sustainable quality of life for communities, will environmental concepts like water sensitive urban design be large enough in scale to have a significant impact. When Australian politicians see the death of the Great Barrier Reef as the biggest threat to our future economy, as a serious threat to tourism as the single biggest industry in the world, might they embrace and initiate sustainable urban renewal projects on a world class scale.

An International Building Exhibition is the single most inspiring opportunity Melbourne can create of its own volition. To create a platform for innovation in water sensitive urban design, as development of this standard draws many economic benefits beyond protection of the natural environment. We currently have the opportunity with current projects like Docklands redevelopment, the commonwealth games and the Aurora Estate to set the benchmark for
policies to be drafted, and private industry to follow suit. They are an existing basis by which to launch an International Building Exhibition. Water sensitive urban design, in this context, must move beyond site specificity, into the testing of modular systems which can be retrofitted into existing traditional wastewater systems, in huge quantities, on small and large scales with economic viability. Many examples researched exist to provide a base for systems like this

- Potsdamer Platz underground water storage tanks and biological filtration system 1998
- Rainwater module developed as a student project at RMIT by the author in 2000
- Hammarby Sjosted, mechanical stormwater treatment plants 2002

I plan to publish the examples of innovations in water sensitive urban design as phot essays in Landscape Architectural and Planning Journals such as “Kerb” and “Landscape Australia” during 2003.

Visual presentations will be the most informative format, so I plan to submit abstracts to Landscape Architectural seminars and the Stormwater Industry Seminar Series, which occur annually. Numerous public and private lectures will be made to RMIT university landscape students, and to the multi-disciplinary design teams with which I work at VicRoads Major Projects and Nillumbik Shire Council.
PROGRAMME

Sweden, Stockholm  8th August – 12th August

- Hammarby Sjosted, Soddermalm, urban residential housing development
- Djurgarden, constructed wetlands
- Hagaparken, indigenous vegetation and wilderness park
- Abrahamsberg, suburban residential housing development

Sweden, Uppsala 13th August – 17th August

- “Indigenous Vegetation in Urban Environments” Conference
  SLU University
- IBM Head Office

Germany, Berlin 18th August – 21st August

- Chancellory Residence, landscape and architecture
- Potsdamer Platz, urban commercial development
- Jewish Museum Berlin
- Lustgarten Park
- Spree river, urban residential development
- Wetlands in Tiergarten

Germany, Hannover 22nd August – 24th August

- Kronsberg, Suburban residential housing development
- Kronsberg, Commercial development
- Expo site 2000, Landscape and architecture
- Great Garden Herrenhausen

Germany, Essen 25th August – 27th August

- Duisburg Nord, Industrial Nature das Ruhrgebeit (ex Steel factory)
- Zollverine, Industrial Nature das Ruhrgebeit (ex Coal Mine)
- Opera House by Alvar Alto
- Schungelberg Estate, suburban residential housing development
- Akademie Mont-Cernis, Herne-Sodingen

Netherlands, Rotterdam 28th August – 2nd September

- Schouwburgplein, urban square
- Museumpark, urban parklands
- The windmills of Kinderdijk
- Netherlands Architecture Institute

Netherlands, Amsterdam 3rd September – 6th September

- Zenderpark, Ijsselstein, suburban residential development
- Commercial development
- Floriade, landscape and flower exhibition
- Suburban Residential development in city, reclaimed wharf area

France, Paris 7th September – 11th September

- Hochwasser, Le Pecq, flood park
- Parc Andre Citroen
- Parc de la Villette

France, St Tropez 12th September – 15th September

- Pieges a sable (Sand Traps) du Pampelonne
INTRODUCTION

The Australian building and design industry has embraced Water Sensitive Urban Design slowly but enthusiastically. Here, in the last six years, engineers have embraced the benefits of biological treatment of stormwater to become not only current best practice, but also common practice for the treatment of residential, commercial and infrastructure stormwater. However we tend to place more emphasis on the benefits of habitat for birds and wildlife within our urban areas than Europe, and for economic reasons we consolidate stormwater treatment into large facilities on the peripheries of suburbia. For Landscape Architects, current trends see water and the treatment of stormwater as the central and most exciting design element in the landscape. We are fascinated with the possibilities of incorporating water into our daily lives through parks and open spaces because we are only beginning to feel the importance of its presence, through drought, the loss of aquatic fauna, the poor water quality in the bay and our farmers dependence on it. As it becomes a more scarce resource, designers enjoy improving the quality of it, and challenging public notions of it.

Europe does not share our fascination with natural wetlands, but have developed much more sophisticated methods for storing and purifying stormwater as a resource. Because space is of a premium in most European cities, open biological treatment of stormwater is not economically rational. However the demand on water as a resource is of the highest priority, along with other sustainable and renewable technologies, and the density of users make mechanical treatment preferable. The German cities I visited were outstanding, by way of innovation in stormwater treatment, landscape design and sustainable technologies.

However, in countries where water is in abundance throughout large urban cities and water has been central in the lives of people in the Netherlands and Sweden, for example, they seem to have almost turned their back on their abundance of water and the treatment, protection and enhancement of it. With a history of reclaiming land from water, water is a commodity to be used and manipulated, and they have developed brilliant technology for this purpose. But their canals still have hard edges, lack aquatic vegetation, and their new urban developments make few efforts to treat the water whilst it is on the land.

In Melbourne, the closest example we will have to the standard set on innovation in European residential developments is the design in progress at Aurora Estate by Urban and Regional Land Corporation (URLC) in Craigieburn. This estate is set to house 20,000 people and is unable to connect to sewer, so the development had the obligation to look towards alternative treatment of all wastewater on site whilst meeting EPA requirements for minimal impacts to high profile receiving waters such as the Merri Creek. However we should not wait until we reach crisis point. Many examples can be learnt about investing in better ways to re-use sewage sludge as resource, for example, at Hammarby in Stockholm (at the Henriksdal waste water treatment plant sewage sludge is turned into biogas to fuel gas cookers and cars, and biosoil used as agricultural fertilizer), or the modern windmills on the Kronsberg in Germany (feeding sustainable power into a regional suburban scale plant).
Stockholm

Stockholm was a beautiful city, more so than I had ever expected. The city is comprised of hundreds of tiny islands, so there are many channels and extensive areas of open water and wetlands to explore and where indigenous vegetation has been preserved. There are few other world capitals where you can swim and fish safely in the city centre. Around 1.6 million people live in the Greater Stockholm area. The city was easily accessible by bicycle, so I had a fantastically enjoyable time peddling to my destinations for investigation, along roadside and separate bicycle paths.

Hammarby Sjostad, Soddermalm, is just part of the largest on-going development project in Stockholm, which began in 1990 as a proposal for an Olympic village for an Olympic games. It represents a new approach to urban development designed to minimize all environmental impacts. At an old waterside dock on Lake Malaren, industrial land is being reclaimed and used to build maximum density housing (8000 new apartments), where energy consumption and waste are minimized whilst economy and recycling are maximized. The City of Stockholm Waste Management Administration has managed the water and sewerage. The system aims to reduce water consumption by 50% compared with other new inner city developments, removal of 95% of phosphorus in grey water, urine and faecal matter to be recovered for agricultural use, the contents of heavy metals and other nutrients in sewage water to be reduced by 50%, drainage water to be linked to the water network and sewage pipes to be fully sealed, with all surface water treated locally.

Wastewater is treated in a separate plant within the nearby Heriksdal wastewater treatment plant. The sewage sludge is used to produce biogas (at a later stage biogas for fuelling gas cookers and cars will be locally extracted from sewage water, using a full scale plant, the first of its kind in the world) and biosoil (used as agricultural fertilizer). The stormwater drains into the ground locally and road stormwater is treated separately. Reduced flow equipment is used throughout to keep water consumption as low as possible. The heating for the development is supplied by the Hogdalen plant using recovered combustible waste, and by heat pumps running on waste heat produced from treated sewage water, at the Henriksdal wastewater treatment plant.

To ensure the residents are involved in the efforts to reduce the environmental impacts of this development, continuous information sources about how it works is needed. An environmental information center has been has been established to make all information available to residents, and it will be available on the web. In addition the Henriksdal wastewater treatment plant will be open to visitors both in person and via the internet. An efficient transport system will include a new tramline, ferries across the Hammarby canal, bicycles and pedestrian networks and a car pool.

The development spreads over both sides of the Hammarby Sjo (harbor), but only one side has an ephemeral and vegetated edge and the other is by contrast a typical wharf style hard edge (this appears to reflect the historic use of the site, and practicality of ferry access which then connects to the ephemeral side by only a pedestrian bridge. Some very beautiful detailing is evident such as open downpipes and lots of permeable surfaces (granite setts in major pedestrian...
desire lines, with gravel elsewhere) which is successfully integrated, but very expensive
treatments. All the natural stone, where does it come from?

One particularly nice detail was a small sedum groundcover used to cover the roof of the garbage
bin enclosure, grown in a shallow layer of gravel, used as ornament, but chosen for its drought
tolerance. However I was disappointed to see no external treatment of the site stormwater here,
with very little indigenous aquatic plantings. Many ornamental waterfalls and the ephemeral lake
development drained stormwater directly out to the sea, which was a missed opportunity.

Germany

Berlin is a fascinating city to understand the interplay between wealth, development and the
community’s quality of life. Most of central Berlin was part of the former communist East. Despite
the objectives of the soviet rulers for communism and equality for all, the landscape and
architecture is remarkably void of vegetation, decoration and human scale. These parts of the
city are still dusty and dirty with litter, with no access to natural resources.

But as the new combined east and west Berlin moves into the future as the new head of state for
the country, the tradition of the New Chancellery buildings continues. Luckily I was present the
day the New Chancellery building was open to the public for free viewing, when adjacent
parklands on the Spree River were also officially launched. What is blatantly obvious about the
building is the continued tradition of massively scaled interior and exterior facades that are
modern, minimal and cold. The building and landscape design demonstrate no commitment to
the environment or sustainability, which says much for the direction and priorities of the new
combined Germany and the vision of their leading politicians and designers. However the same
cannot be said for the Potsdamer Platz, also in Central Berlin.

Similarly public squares that surround the old public Reichstag Museum, which were currently
under reconstruction and were again minimal and very large with large sculpture as ornament.
Even smaller public spaces that have recently been re-designed such as ‘Lustgarten’ by
Desvigne and Dalnocky are beautifully detailed with custom seating etc, but are very understated,
economical and never ornate or superfluous – very functional and serious landscapes. I could
generally find little escape from the concrete jungle in the glaring heat that was Berlin in Autumn.

However the Potsdamer Platz was an exception to this, but still this inspiring landscape could
never compete with the massive and super-human scale of the architecture designed by Italian
architect Renzo Piano. The theme of water was a defining element in these open spaces, among
the towering shadow of the Sony and Damiler Benz headquarters. The project set out to use
rainwater for flushing toilets and watering green areas, and using rainwater collected in the
underground tanks to feed a ornamental pools and water features. The design also offered the
opportunity not to lower the groundwater during the building phase and to make an intermediate
collection of all the rainwater that fell onto the buildings. Five underground tanks with a total
volume of 2,600 cubic metres, with an additional storage buffer of 1,300 cubic metres. Sediments
start to settle in the underground tanks before the water flows out of source vessels through
purification biotopes(ecosystems), where it is cleaned biologically and chemically. Where
necessary mechanical filters can also be used to remove the algae in the summer months, which
was visually present during my inspection of the system.

In the Marlene-Dietrich- plaza water flows in intricate patterns to the lowest point, where water
glides over shallow steps, into linear wave cascades, creating a clear link with the architecture.
The local government claim the water quality has been high, the storage capacity adequate and
the use of freshwater reduced within the buildings, whilst providing a unique public space and
recreational area in the heart of Berlin.
Hannover was by contrast smaller and greener, and I felt a sense of a greatly improved quality of life and access to open spaces was much more accessible for residents. The residential development on the Kronsberg was highly innovative, attractive and lively with schools, public trains and industry (commercial) as a fantastic mix towards a successful sustainable future. This was a highlight on all my site visits.

The development on the Kronsberg in Hannover was driven by Expo 2000 “Humankind – Nature – Technology” and following a current housing shortage of 20,000 residences in the 1990’s. The results of an urban and landscape planning ideas competition placed three thousand dwellings including 200 terrace houses on the highest elevation in Hannover, and included a district arts and community center, primary school, kindergarten, social and multicultural projects, and excellent transport links with consistently high ecological standards. Individual neighborhoods were designed as a whole, and the long geometrically austere layout of the district (three kilometers long by half a kilometer wide) was defined by the topography and the town planning criteria. Building density was highest, up to four and a half stories at the foot of the hill, and density gradually decreases to a minimum of two and a half storeys at the top of the hill. The walk to the tramline was not more than 600mm away for all residents, and countryside was the clearly defining boundary to the east. Despite the grid layout, variation and qualities of urban spaces were achieved through alternation of block and courtyard layouts, interspersed neighborhood parks and a network of avenues and green corridors over the district.

The natural ecological water balance at Kronsberg uses slow infiltration through a roadside swale system approximately 11kms in length, into bio-retention systems where the water soaks into gravel filled trenches and into the landscaped green courtyard spaces. The water is stored in the trenches and some permeates into the ground, with the surplus flowing to several recreational areas where further retention is facilitated. The water here is used as an important experiential design element within visible watercourses in open spaces, and is similar to how we have approached water sensitive urban design in Melbourne, at Lynbrook Estate for example. Besides the importance of the integrated planning, however, is the quality of the overall modern architecture and high quality finishes within the landscape, which made this development outstanding. Unfortunately our residential developments do not place the same level of controls on the array of individual architectural styles, and architecture is not designed cohesively at neighbourhood level, where most individuals opt for massive neo-georgian, American style dwellings. The high quality architecture and variety of small to large public spaces make no comparison to any suburban residential development in Australia of the same scale.
Essen was my next destination, but is seldom on many tourist itineraries. “Das Ruhrgebeit” is the term for the Industrial Nature Trail that is the new backbone of public open space for a whole city. On all trips, even ones as well planned as this one you hope to learn something completely unexpected, and the Ruhrgebeit was that. Once Europe’s largest industrial and mining regions, with a population of 5.5 million concentrated into 25 large cities, the area stretches along the Ruhr, Lippe and Emscher Rivers from the Dutch border to the eastern Westphalia flatlands. While the region provided the steel and coal that turned Germany into a modern nation, its contributions to the German War also made it a prime target for Allied bombers in WWII. Today the cities are modern with technology, administration, insurance and banking the major industries. Not evocative of a distant past but constantly evolving and re-defining itself, and the landscape is in the very early throws of evolution.

Their notion of parklands would be unique and foreign to most countries in the world, especially Australia. Australians would not be able to cope with this concept of parkland nature, adventure playgrounds and museums all rolled into one especially until we place a cap and control public liability. The relatively young nature of the industry makes it a surprising comparison to Australian suburbs and the rate by which the suburbs developed and sprawled. At the start of the 19th century the region was covered in open fields of deciduous woods and coniferous woodland. The arrival of the industrial revolution changed this irreversibly where coal mines, factories, housing and roads isolated and detached the natural landscape.

This not only affected the surfaces of the land, but morphological features also changed the regions waterways. The flat landscape of the Emscher lowlands became a walled-in network of canals. Today this has been re-naturalised at great expense and effort. Atelier Dresseitl’s project, the Lanferbach in Gelsenkirken illustrates this. A great number of still waters have been created in the Ruhrgebeit due to subsidence (waters created when the land surface sinks below water level or a stream in the subsidence gets dammed up). These have in turn provided new habitats for endangered animals and plants similar, to the Growling Grass Frog habitat created in Craigieburn quarry holes. More than half the subsidence waters are now nature conservation areas.

The closure of the coalmines and steel works resulted in large areas of abandoned wasteland. These areas contain a great variety of different types of sub-surface soil, most of it man made and chemically polluted. Here wild plants, some exotics brought in with industrial imports, have sprung up spontaneously. Because each site is so different to the next in terms of plants, climatic situation and its range of uses, experts have discovered habitats which never previously existed in the region or which had partly disappeared due to the land being used for other purposes. New communities of plants and animals have sprung up which are highly dynamic and unstable ecosystems. They make for a rich variety of different landscapes and are a valuable recreational resource for people of the area.

The Emscher Park International building exhibition (1989-1998) played a crucial role in upgrading the Emscher region both economically and ecologically. Architecturally outstanding industrial monuments have been renovated and opened up to the general public and are now the focus of a growing tourist industry (which is still new – little is reproduced in English and I was greeted with much surprise to be a foreign traveler. I met no English-speaking travelers even in hostels).
In 1950s the coal-mining crisis began which put a break on employment in the region. Fierce competition from crude oil, natural gas and cheap imports of coal resulted in factories shutting down and huge job losses. The last coal mine (Zollverein) closed in 1986. Despite this decline in heavy industry and the accompanying economic and social consequences, the region worked on creating new economic structures in the 1960’s. Universities and polytechnics were set up, transport infrastructures were increased and modernized, and new business sectors like chemicals, power, non-manufacture and environmental technology began to replace coal and steel as the predominant economic factors. Structural transformation is not all, as there is a huge and unique network of cultural institutions comprising over two hundred museums and public galleries, theatres etc.

The regions movement from urban centers to peripheries is similar to our problem with urban sprawl. The choice of where to live depends primarily on the quality of the immediate district, house prices and infrastructure. In fewer cases it depends on how easily it is to get to work, shopping centers and the amount of leisure and cultural activities. Urban centers have better access to amenities, and offer better living conditions for families. In the Ruhrgebeit, as in Melbourne and most other Australian cities, people have been moving out to peripheral areas for years with increased ownership of motor vehicles. People moved to the Ruhrgebeit region with such rapid pace during the boom of coal and steel, that it is only now that regional planning has been introduced to improve the quality of towns, optimize traffic, and compensate for the damage inflicted on nature and the landscape by providing recreational green areas for the benefits of residents.

Seven regional green zones, running North-South were reserved for the conservation of green spaces. Within a framework of the Emscher Park International Building Exhibition, they joined the areas into the ‘Emscher Landscape Park”, a green backbone running through the industrial cities. Europe’s largest regional park runs along the Emscher River linking the green zones in an East-west direction over an area of more than 320sq.kms (large sections of which have been newly cultivated), with the 230km long Emscher Park Cycle trail at the heart. 17 municipal authorities, two districts and the Emscher River are linking the towns into a gigantic single park with facilities for sport and games, untouched nature, cultivated parks and artistically designed landscapes. Industrial nature and industrial culture have joined forces to create a new form of cultivated landscape.
Just one of the industrial nature parks was the 200 hectare ‘Nord Landscape Park’, a project of huge ambition, physically and aesthetically. Their concept of parkland calls for a revolution in ones thinking of what a park can be. Heavy metal bands play gigs from heaps of slag, and mountaineering clubs scale the mass of concrete structures of former industry bunkers that housed ore, lime and coke. The design and preservation of these places is based on a new appreciation of their industrial inheritance, where lines of old railway embankment are now a form of land art and will be managed as natural grassland. Structures are being conserved in a way that makes them safe enough to climb, but also allows them to rust.

Two fundamental ecological principles guide the new development, firstly in the recycling of old materials in their current form and in an altered state, such as bricks crushed to form the aggregate in concrete. The second is the water cycle, where surface water from the roofs, roads and paved areas are directed into the existing open drainage channels into cooling basins and old settling tanks. The water has to be purified of dust contaminants undertaken by a wind powered water drop on the site of the old sintering plant. The water is passed into an old polluted waste water channel called the Old Emscher which crosses the park, where there are different water zones of vegetated banks range in depth 10-50 centimetres, settlement areas up to 2.5 metres deep, and gravel and sand banks. Lighting displays light up the steel structures by night, deep water diving to 13 metres is housed inside a gasometer, adventure playgrounds and public swimming pools are on disused sites, to create this incredibly stimulating and exciting concept for public recreation.

Zollverein was another beautiful Bauhaus mine designed 150 years earlier, and closed as recently as 1986. It had been left redundant for ten years while the local government and the community decided what should be done with it, including pulling it down for a new shopping complex. The advent of the ‘International Building Exhibition’ focused on preserving cultural heritage, and it took three years to clean up and build the first museum with artist spaces in time for the launch. Rem Koolhaus and his practice OMA are currently working on a masterplan for its future development.

The main source of finance for the project is the ‘Ecology Program in the Emscher Lippe Area” which was specially created for the purpose by the state of North Westphalia (This project funding was also designed to include culture, leisure, tourism, youth and urban development) Many housing environment projects have been introduced over the last 20 years to remedy the planning mistakes of the industrial past. New housing developments were also built that were not
only architecturally outstanding, but also contain such ecological features as sod roofing and rainwater collection.

All the projects I saw were initiated by government bodies, be it an International Building Exhibition, Expo or Commonwealth Games etc. Private development does not appear to make these initiatives on their own. Once governments have taken the risk and provided incentives, private industry can be expected to follow. It has been in this way these major towns have reinvented themselves, and regenerated abandoned areas and improved the quality of life for the inhabitants, to build a basis for a cultural and natural tourist industry that was previously non-existent. I found this region to be the least naturally inspiring, but the most exciting and stimulating of my whole fellowship.

**Netherlands**

Rotterdam is a very inhospitable urban city for an Australian. The explosion of new modern architecture is exciting and much heralded here, but is surreal to experience on such a massive scale amongst this polluted and gray city. Nature, parks or gardens to escape to in hot dry weather do not exist, and problems with hostile beggars in public spaces makes this city the least inspiring for a landscape architect interested in sustainable developments, let alone a tourist looking to enjoy the outdoors in the city. The streets, building settings and public open spaces have few trees and little vegetation, are dirty and littered and any presence of water within the landscape is limited to sterile canals and waterbodies.

The Dutch are of course famous for their innovations in water, so I was extremely surprised to discover this relates only to land and water as a commodity. Their use, control and management of water relates mostly to the reclamation of land, where dijks and windmills have become their most famous icons. I spent much time at Schouwburgplein (Rotterdam’s most internationally renown urban square) sitting and watching how people utilized space and interacted within it. Despite being harassed by beggars constantly while I sat in this most public and busy of civic spaces, I enjoyed a very hot day along with many other people sitting on the West 8 custom designed park benches. It was a transient space where people only sat and lingered briefly, and despite the exquisitely detailed landscape elements, there was no evidence of any sustainable environmental principles and no vegetation at all. Quality of life for residents through ecology seems nonexistent, when so much money is being spent on architecture I felt the lack of appreciation for urban nature alarming.

Reclaimed land in the Netherlands has lead to little consideration for indigenous vegetation, and the lack of large mature trees is not promoting an ethic towards maintaining the balance of nature within the city. However the housing shortage in Rotterdam is a more likely justification, but I felt the public spaces lacked scale, vegetation and any ephemeral quality. The abundance of water has lead to a disregard for it, or lack of need to treat and protect it as a resource. They have not explored the potential for sludge and litter, which accumulates in the canals, to be biologically collected, as the canals were visually contaminated (I imagine canals would lend themselves to perpendicular bands of planted aquatic vegetation). Despite the fact the canals may need to be continually dredged, I could still see numerous solutions.

Zenderpark, Utrecht was a residential development similar to that on the Kronsberg in Germany. A less expensive landscape design with fairly economical input and low cost fittings. Many canals were present with some vegetation to banks, but no visible treatment of water in the landscape eg. No aquatic plants or wetlands. No use of swales, kerb cuts or depressed planting beds were evident, where even the nature strips were raised above pavement level, and the large public parkland was devoid of the woody and wild vegetation of other European parklands. The extensive use of gabions historically from the older subdivisions has been referenced in this new development, where landscape walls are recycled bricks contained within the wire baskets. Some nice landscape details however, such as a handrail with no horizontals, just closely spaced galvanized verticals which was very beautiful.
CONCLUSIONS AND RECOMMENDATIONS

Among the fundamental planning activities undertaken by the International Building Exhibition were preserving and developing new uses for important industrial monuments, landscaping disused sites, implementing ecological programs (especially to conserve and develop industrial nature and redesign the Emscher system), and constructing new facilities for cultural, social and sporting activities. Australians need a profound change in government or political climate to stimulate a renewed enthusiasm for cultural change on this level. Australian cultural identity, based on a greater appreciation of our unique and diverse natural landscape, is still lacking in the greater community and with our politicians. Melbournian’s have lost all faith in Federal and State Governments because the land and social standards are being continually degraded and worn down by poor social and ecological policy. There is a lack of optimism in the Australian vision for the future, contrary to that of Europeans (evident during the indigenous vegetation conference) who see change in the landscape as exciting and diverse, increasing biological diversity not simply destroying it.

Europeans see resilience in the natural landscape because they have the experience of history to prove man can live with the natural environment, where it has not meant a total loss. Perhaps it is that they do not remember also the pristine quality of their natural environment to really value it like we do. They have the optimism that social climates will and do change for the better, where Australians are generally much more pessimistic. For example, a survey presented at the conference indicated adults prefer to travel long distances to large wilderness areas for nature experience, and seldom use local neighbourhood parks for this purpose, while younger children do make extensive use of nature very close to home in small reserves and pocket parks. But they acknowledge we should not accept that people will always hold this value, and always be able to drive to nature in the future, and must not respond by only planning larger nature parks in isolated regions because natural resources will become more scarce and private ownership of cars decrease, to make environments immediately surrounding the home or neighborhood crucial. In design we must not exclude the unexpected behaviors of future generations in the preservation of indigenous vegetation in urban environments.

This notion of preservation of indigenous vegetation for unknown purposes in the future is a truly inspiring thought for Australians who love the bush, and tend to think the rapid destruction of our natural environment is inevitable, and a foregone conclusion. Europeans have had the time to see their own indigenous communities exploited and unnecessarily destroyed, but have seen them remain in a changed, but none the less natural state. An argument used towards sustaining all types of biodiversity, with the term ‘semi-natural’ is totally foreign in Australian ecological language. We think our plants and ecosystems are either indigenous or they are not (they are exotic) – we have little appreciation for the possibility of a grey area in between. For example Herbert Sukopp in Berlin is an esteemed professor of botany and how the characteristics of indigenous plant species have evolved by the external pressures of urban environments. Eg Pollution, trampling, changed soil moisture levels etc, have all caused new species characteristics to evolve. The Europeans view this as an increased opportunity for bio-diversity, which accepts the interventions of people and urban developments as beneficial and exciting, and one which should not be overlooked in discussions of what constitutes “indigenous vegetation”.

This is interesting on a local government level at Nillumbik, where we allow urban development in indigenous bushland, and deny it is altering the indigenous nature of it. The pressures brought about by people living in the indigenous bush will change the nature of that environment, and change the genetic makeup of the species over time. If we accept the change however, then a whole new and exciting array of design and bio-diversity opportunities will arise eg. The idea to select good urban tree species (indigenous species) to cultivate superior urban forms that will ultimately help to preserve and increase bio-diversity. Poorer specimens rarely get planted in Nillumbik e.g. Euc.cypellocarpa or macrorhyncha, but if good forms of those trees were chosen and grown by specialist tree growers/horticulturists, these trees would stand a better chance of being preserved and used within urban landscapes, increasing bio-diversity. Currently people only plant Yellow Box and Red Box, so if we assume this pattern continues, even with Nillumbik policy ‘live local plant local’, the whole future of Nillumbik plant communities will be dominated by the same limited palette of overstorey trees, few grasses and groundcovers (the tough and
trusted ones, worthy of cultivation). Many forms will succumb to urban extinction. We need to consider a strategy where we use our horticultural knowledge to improve the quality of our indigenous ecosystems, and this is widely unacceptable in Australian ecological practice. We have to improve the selection, form and tolerant qualities of indigenous plants to improve species biodiversity for those weaker plants in the future. We have to accept our impacts, notice the trends that are developing, and propose strategies to preserve the species that are not tough enough to survive in our urban environments. (We should also research the sources of our indigenous nurseries Wyeena, to see where they source their plant material and test if all our indigenous plants are coming from the same source, and do they have desirable qualities)

As an aside, From the water sensitive urban design examples I have seen, my module design is still very innovative and advance beyond the current best practices of swales etc, where larger spaces permit. My module should still be the basis for an International Building Exhibition in Melbourne. Innovations trailed for environmental benefit, setting Australia as the ecological superpower, an opportunity to lead the world in the preservation and pristine quality of our natural environment, see a shift towards future economic growth and tourism and most importantly an improved and sustainable quality of life for Australians. When will Australian politicians see the death of the Great Barrier Reef as the biggest threat to our future economy? Our landscape, both constructed and natural is the most significant asset we have that attracts people from all over the world, and our governments still refuse to put an end to the degradation for short term gains. We must live well today, whilst preserving the well being of the future. This requires a huge political initiative, and maybe an International Building Exhibition in Melbourne could be that.
BIBLIOGRAPHY