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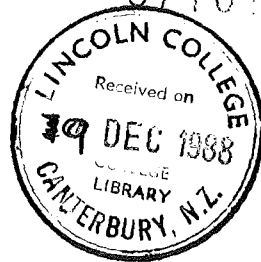
PLANTING DESIGN, MANAGEMENT AND MAINTENANCE - IN PRACTICE

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57101



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chapter one

INTRODUCTION

1.1 DESIGN, MANAGEMENT AND MAINTENANCE.

The profession of Landscape Architecture has many facets. It regards itself as capable in such areas as minor engineering works, ecology, environmental assessment, land use planning, project management and design. Some of these areas are regarded as the preserve of other professions, but there is one area that is regarded as strictly the landscape architect's, planting design.

Design, of which planting design is an important part, is the initial element to the profession. At this stage it is enough to call design a rigorous, creative problem solving process. This idea is recognised by Lucas (1988) who deals with rural landscape and landscape evaluation. McHarg (1969) uses an information based, ecological approach for landscape design. In a similar vein Wakeling (1979) and Lockhead (1980) talk of the value of design to solve predominantly urban planning problems. So as can be seen design can solve problems in a variety of different situations. However, in the approach to design the designer must be aware of the requirements and characteristics of the materials he or she is working with as a central element.

In the case of landscape design, where planting design is integral, the facet that cannot be overlooked, and is indeed a great opportunity, is dynamism. This is stated eloquently by Sir Geoffrey Jellicoe (1980) who said in reference to landscape architecture "it has one quality possessed by no other art that is not ephemeral - certainly not architecture - which relates it uniquely to the way of thought in the modern world: the sense of constant change."

Dynamism in the landscape brings a fourth dimension to design, that of time. This is nowhere better illustrated or more essential than with planting design. This is expanded by Colvin (1974) and Fairbrother (1974) who describes planting design as "fluid four-dimensional planning with living material." Plants are not static and their time frame of change is significantly shorter than other elements in the landscape. This change over time includes birth, growth and death as well as seasonal change. Spaces, vistas, textures and colours change with plant material over time. So obviously planting design will have to incorporate this change, the additional dimension of time. With plants this very change is a unique design opportunity and should be worked with not avoided. How then is change over time manifested in planting design? What mechanism makes this a positive process?

In practice a combination of design, management and maintenance is used to accommodate the affect of time on a planting design. It is the intention of this study to examine this relationship in practice but first of all a good grasp of these factors individually and together is important.

DESIGN

Design is the process of creating physical solutions to problems. It is both rigorous and goal directed. As a process it involves the developing of a solution as shown by the Concise Oxford Dictionary which says "design involves artistic or literary groundwork, general idea, plot, faculty of evolving these, invention." Clouston (1977) also supports the goal directed, or purpose, aspect of design with this quote "Design implies purpose; the adaptation of means to intended end. It implies change from that which has been to that which will be under new circumstances."

Relating design to planting, it can be seen that the design of planting can solve a number of problems. As an example Laurie (1986) says planting design encompasses "space division, movement, visual relationships, microclimates and erosion control." From this two important factors arise. Firstly, planting design involves addressing all the problems outlined by Laurie. Therefore the creation of a new planting arrangement to solve a problem does not necessarily involve the use of design. Hence not every planting arrangement or alteration is a planting design.

MANAGEMENT

Management is the manifestation of design solutions. Where design creates the solution management makes them work in practice. This is echoed by Kirby (1986) who says "Landscape management is the process whereby the intentions of those who control land and the activities thereon are put into practice. It is a continuous activity following on in "these" cases from a design or plan."

Managers define aims, which can also be done by designers when there are no managers involved. From here specific objectives are set up (Kirby, 1986). In this facility the manager has a free reign to ensure the design intent is carried out. This is shown by Clouston (1977) who says "Landscape management is undertaken by professionals to ensure the objectives of the landscape design are achieved on the ground in such a way that the landscape evolves and matures over time to the satisfaction of both designer and user. Management concentrates on the establishment and development of physically and visually acceptable relationships between the land and its living communities."

As already stated in some situations landscape managers per se are not used. In these cases designers will define management goals which will then be translated into maintenance regimes. This will be further discussed in the section on maintenance.

Also changes of management objectives may be required where site use changes as identified by Clouston (1977). He identifies conflict arising from change of use, increase in existing land use, change of users to produce incompatible activities and also problems arising from changing environment and existing plants. However, in situations such as these a new design may also be required. So while it is important to recognise this facet of site use it is outside the brief of this discussion.

MAINTENANCE

Maintenance is, as it says, concerned with the maintaining of existing features. This is expanded by Clouston (1977) who says landscape maintenance is the "routine care of land, vegetation and hard surfaces in the manner prescribed for their satisfactory establishment and continued future development." Maintenance itself has a static nature then. So that when it is not connected to a management plan it can only be concerned with the well being of existing planting.

1.2 THE RELATIONSHIP BETWEEN DESIGN, MANAGEMENT AND MAINTENANCE.

The relationship between design, management and maintenance could be discussed at length but for the purpose of this discussion a simple understanding is all that is required. A more comprehensive discussion can be found in "Ecology and Design in the Landscape" (Bradshaw, Goode and Thorpe, 1986).

From a planting design management aims are defined for the continuity of design intent. From this point management objectives are laid out. There are "actual programs capable of being carried into action" (Kirby, 1986). Part of these objectives may be the maintenance of plants in certain situations. Hence management has a broader scope than maintenance and refers to well being of plant communities rather than single plants.

Problems can arise in this relationship. Firstly the fact that maintenance on its own is static means it is incongruous with plant material itself. Secondly maintenance on its own can create what are essentially management or design decisions when the static nature of maintenance conflicts with plant growth and development.

This relationship has many intricacies but the first step to understanding how it works in practice is to find the factors that affect the relationship. This then is the purpose of this discussion not to examine the relationship closely in theory but to isolate factors that are crucial to the relationship in practice.

1.3 METHODOLOGY.

The aim of this discussion is to examine design, management and maintenance in practice. Therefore what is needed is the presentation of real information from projects that have been implemented. Within this need a financial and time restraints had to be met.

While examining real information to a reasonable depth a breadth of information had to be obtained. This is to be sure that the results are representative or that at least we know where they fit in to the spectrum.

It was decided to use a small number of case studies. From these a depth of knowledge could be gained about the cases. Also gathering this information from the landscape architect involved could lead to a broader discussion on design, management and maintenance yielding experience from other cases and also motivation factors involved in the situation.

This methodology is backed up Kirk and Miller (1986) who say case studies are a way to find detailed information which can lead to motivations and causes. This information may then be applied to other cases. Simon (1969) examines both case studies and expert opinion. Case studies provide a wealth of information about a subject which then provides clues and ideas for further research. This is different from expert opinion. According to Simon (1969) this uses the expert's mind as an information filter and can access objective information faster than other methods. They can also supply judgement based on the entire picture.

So from this reading, case studies combined with expert opinion were confirmed as appropriate methods of gathering information. Initial enquiries exposed differences in approach between the public and private sectors. Also it was thought that it would be useful to examine projects that had just been implemented as well as those that had been in existence for a significant time. In this case time enough for the planting to develop and see how this was being coped with. From this it was decided to choose four case studies, two from the public and two from the private sector. Of each of these pairs one would be an established site and one a newly developed area.

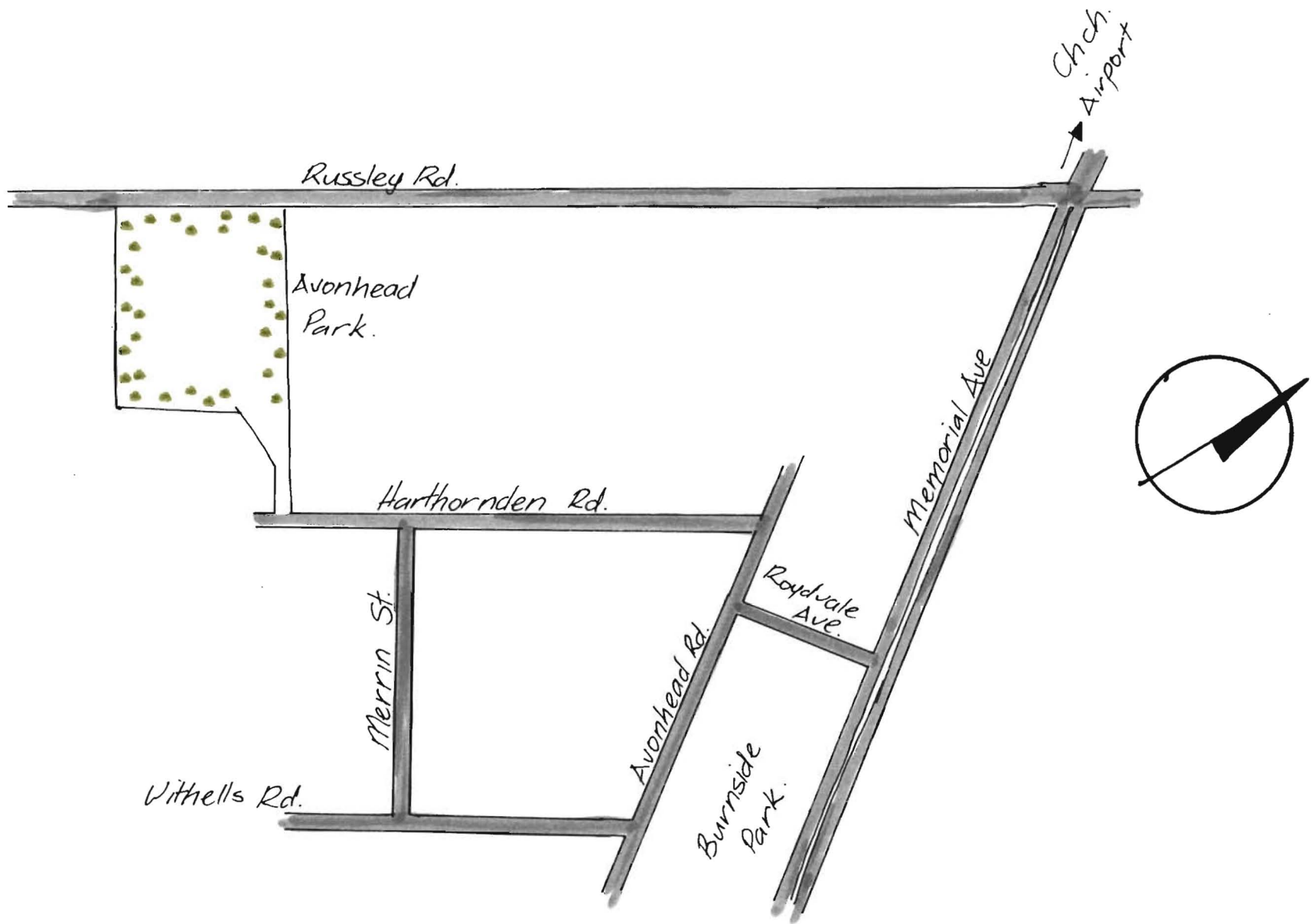
Having decided on these case studies it was then appropriate to examine a wider range of cases to put the existing studies in context and also gather more, general information. Hence ten other cases and planting approaches were examined. These were based on the amount of information given in their accounts in the literature. This had to be of sufficient depth and have a mention of after care and its relationship to the design. They have been gathered from magazines representing the

landscape architect institutes of New Zealand, Great Britain and the United States. This is not intended to be a comprehensive literature review, only to present a series of further cases for the purposes outlined above.

Having presented the cases then crucial factors in the practical application of design, management and maintenance will be found. These conclusions will then provide the questions for further study.



chapter two
THE CASE STUDIES



map one
Avonhead Park

2.1 AVONHEAD PARK.

INTRODUCTION

Avonhead Park is a new park owned by and being developed by the Waimairi District Council. Its main purpose will be as a sports ground but it will also have picnicing facilities. It covers 19.5 hectares and is situated at the end of Hawthornden Street bordering Russley Road on its northern boundary, (refer map 1).

This site was chosen because the Waimairi District Council uses a planting system that links design, management and maintenance in the field. This design has just been completed and hence it is interesting to see the design approach and subsequent plans.

The park was commissioned, designed, implemented and is being maintained by the Council. There are no legal contracts, in the business sense, between the different groups.

For this case study information was gathered from three visits to the Council's landscape offices, several phone calls and two site visits. Anne Greenup was the designer and gave most of the information. However Sheila Bassett was also very helpful with information on a more general basis. A lot of this was on the Council's system of financial allocation, a brief description of which follows.



quick growing shelter species.

FINANCIAL ALLOCATION

Every year money is allocated by the Council's Parks and Reserves Board for planting. This is released at the start of the planting season which runs from May to August. The landscape architects do have some input although their main task is to decide how much money goes to each park or reserve for that year. From this update, planting is planned or new recreation areas designed.

It is under this system that Avonhead Park was initiated. Anne Greenup said that the money for this project was sufficient and the Council seems intent on retaining its "tree allowance" system. The only problem cited in this case was the lack of time from when the finance was announced to when the design had to be implemented.

Sheila Bassett said that with an existing reserve, changes are made with reference to existing plans, sometimes however these have to be made on site, usually by the landscape architect.

THE DESIGN

The small amount of time and the need for shelter were factors in the formation of a peripheral shelter planting plan. This was set out on a series of grids (refer to Appendix 1). The grids were typically 24 metres long by 8 metres wide. Various encalypts and acacias were used as the bulk of the shelter belt and to establish shelter quickly. Also used were slower growing



long term thuja and medium
term eucalypts.

thuja. Although the system uses a grid to set out the plants location on the ground, Miss Greenup intended a look of informality and irregularity. She is not overly worried about small numbers of plants dying as this will add to the affect.

Plant selection decisions were made with the help of the Council's planting technical adviser, Jo Cartman, who also runs the nursery. Jo's expertise has been described by Miss Greenup as indispensable.

For planting PEP workers were used. They were given a half hour talk by Mr Cartman and Miss Greenup on the aims of the project and the techniques used for planting. This was followed by a brief demonstration. Plants grown in root trainers were used for the optimum combination of cost and growth. They were planted a little bit deeper than usual to protect the stem base. Also young plants were used for better adult form. Miss Greenup pointed out some trees on an adjacent section that had been planted older and had suffered in the wind. Also a selective trickle irrigation system was installed.

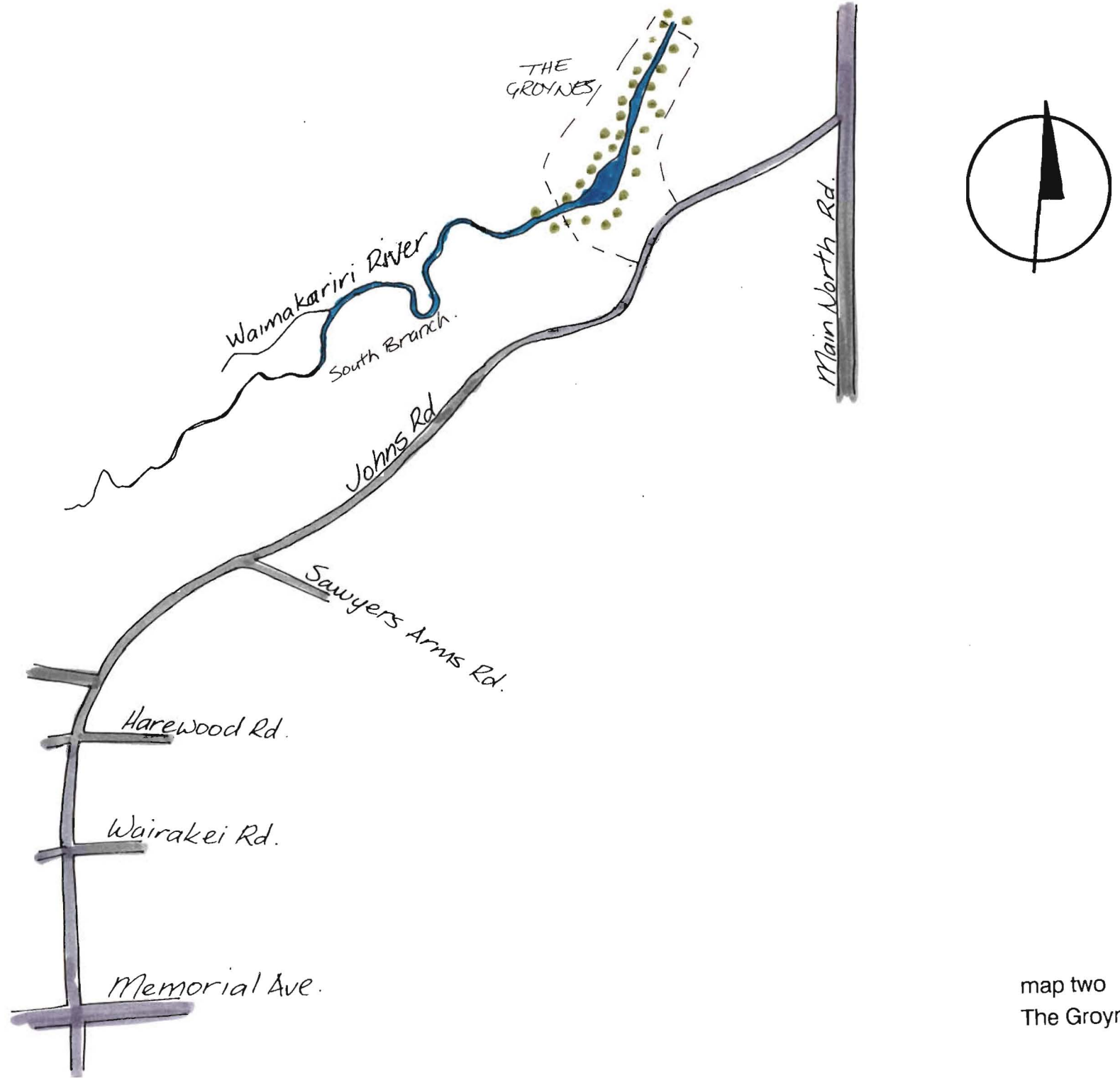
Since the planting was completed in 1987 the gardeners have been mowing, controlling weed growth and working the irrigation.

SUBSEQUENT CARE

From this original planting design two more stages of design have been planned by Miss Greenup.

The first of these is a network of woodlots. This stage is planned for next year (1989) after the initial planting has had two years in the ground. A staged coppicing management system with a five or six year rotation is envisaged. The layout for these has not been designed yet and Miss Greenup plans to do this at the start of the planting season. One use proposed for the coppiced timber is as firewood.

The second stage of planned design is the planting of walnuts and other nut trees. Miss Greenup plans this as the long term tree network along with the slow growing trees already planted. Jo Cartman has suggested these be planted as nuts. The aim here is for better adult form. The time for this stage of planting is not definite yet and will be dependant on when the other already planted trees can provide sufficient shelter. They will be located within the coppice woodlots although individual placement has not been decided yet.



map two
The Groynes

2.2 THE GROYNES.

INTRODUCTION

The Groynes is a picnic and recreation area situated on Johns Road, Belfast (refer Map 2). It is owned and run by the Waimairi District Council. It has picnic areas, walkways, lakes and areas for a variety of passive and active recreation.

The Groynes has been chosen as a case study to show the relationship between design, management and maintenance in an existing park run by a public body. That body is the Waimairi District Council as in the Avonhead Park case.

The Waimairi District Council in conjunction with the Beautiful New Zealand campaign was responsible for initiating the work outlined. The designer was Jenny Roy who has subsequently left the council. It was implemented and cared for by the council. The design work was done in 1984. This case study focusses on the area concentrated between Johns Road and the branch of the Waimakariri River closest to the road (refer Appendix 2).

Information was gathered from three office visits to the council, several phone calls (one to Mike Barthelmah who worked for the council in 1984) and a site visit. Anne Greenup and Sheila Bassett were most helpful in supplying information here.



defining picnic areas with *Betula pendula*.

THE DESIGN

In 1984 as part of the Beautiful New Zealand campaign and as part of the Waimairi District Council's annual planting system it was decided to update the planting in the picnic area and road frontage adjacent to Johns Road. This is part of a larger development being undertaken for the Groynes by the council.

Two plans were drawn up by Jenny Roy in June and July of 1984. One was for the road frontage and related to the Beautiful New Zealand programme. Funding for this plan was obtained from the government. The other plan related more to the picnic area (refer Appendix 2a). Once funding from the government was obtained implementation was carried out at the discretion of the council.

Within an existing network of quercus and salix, betula and pinus species were planned to further define picnic areas and boost planting along the road (refer Appendix 2b). Under planting of native species was also planned. There were approximately 25 species defined on the plans. They were to be of local genetic stock and to be a minimum of 400 millimetres high when planted.



forest duff and fencing.

IMPLEMENTATION

Planting has been carried out over the last five years during the planting season of May to August and according to the finance allocated to the Groynes each year.

One major change from the plans was outlined by Anne Greenup. Instead of planting the native plants in the manner outlined on the original plans a system of leaf litter seeding has been used. Using this system seeds carried in the leaf litter layer on the forest floor are transferred, leaves and all, to the site where the "duff" is re-layed and the seeds left to germinate themselves. This decision was made by Miss Greenup and Jo Cartman the council's technical adviser. The aim was to produce a more natural variation of species. This system was felt by Miss Greenup to be particularly relevant in this situation when planting was carried out over a number of years.

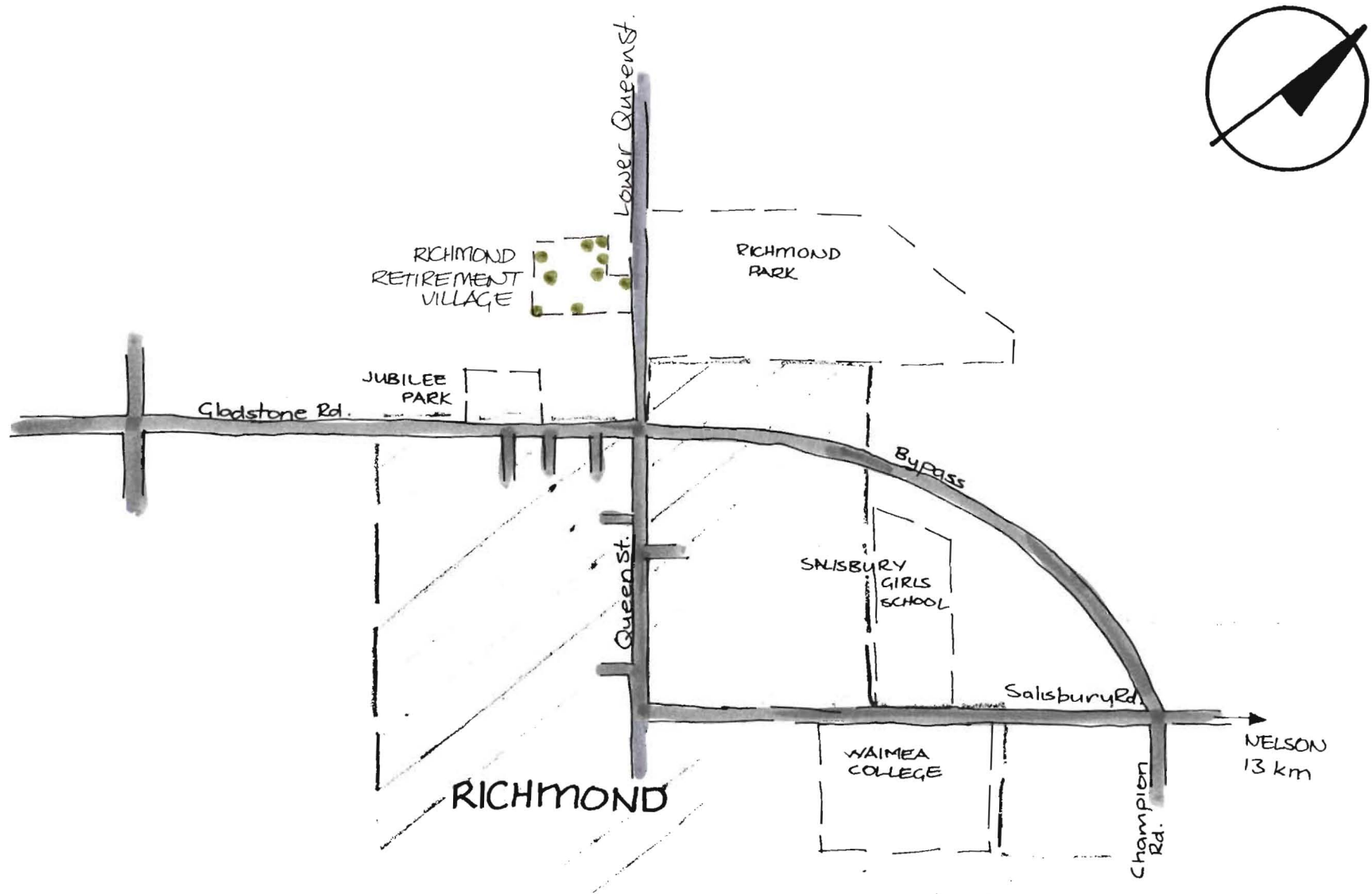
This planting and that of the trees was carried out by a variety of periodic detention workers, Access workers and the council's own gardeners. Access and periodic detention workers were used to spread the duff. The open ground planting was done by the gardeners. According to Sheila Bassett this requires more skill and training and is harder work. This training allows the landscape architect only to have to indicate the placement of trees by spray painting their location on the ground.

PLANT REPLACEMENT

As part of a discussion on the Groynes the system of plant replacement was also defined by Sheila Bassett.

On discovering a plant that has died a gardener will make a note of it which will go to his or her foreman. In a straightforward case such as vandalism or one where the plant has died due to something that doesn't usually occur in its environment an order for another plant of the same species will be placed.

In a situation where a reappraisal of the species used is required a memo to the landscape architect will be forwarded. From this a decision on the replacement species will be made by the landscape architect in consultation with Jo Cartman the technical advisor.



map three
The Richmond Retirement
Village

2.3 THE RICHMOND RETIREMENT VILLAGE.

INTRODUCTION

The Richmond Retirement Village planting design was done mainly by Tracy Ower of Boffa Miskell Partners Ltd in late 1987. It was implemented over the 1987/88 summer. It is situated on a northwest facing slope on Lower Queen Street, Richmond, Nelson (refer Map 3).

This example was chosen to illustrate the relationship between design, management and maintenance in a recently designed and implemented planting design in a private business situation. The area of this case study is the display home area (refer Appendix 3). The rest of the complex is being built in stages.

The client was originally a subsidiary of the Paynter Group which was then amalgamated during Boffa Miskell's association with the project. As stated above the main designer was Tracy Ower. The planting contractor was based in Nelson.

Information for this case study was gathered from four office visits, several telephone conversations and photos, kindly made available by Ms Ower.



Semi-mature planting.

THE DESIGN

The client had been involved with this type of project before and had used Boffa Miskell, so it was through previous experience with the client that this job was gained. Payment was based on a certain percentage of the construction cost of the job which is the usual system said Ms Ower.

The site had a rolling slope to it and a number of established trees. From this Ms Ower established a design using the warm climate and the established trees. A simple layout of lawns flowing under the trees and bright interesting shrubs around the units and central meeting complex was arrived at. For each set of units a different combination of shrubs was used to give them a distinct character and make them more easily identifiable.

Because the particular area being used for the case study is a display home the client wanted it to look complete quickly. Ms Ower specified more mature plants than usual. The result is that the design will reach "maturity" in three to five years according to Ms Ower.

A management plan was not part of the brief and in this case the client only saw the need for maintenance. Ms Ower however would like to review the site regularly. She cited an interval of three years in this case.



instant landscape, using readylawn and semi-mature planting.

IMPLEMENTATION AND SUBSEQUENT CARE

For the landscape contracting a system of nominated tenders was used. This offers the contract to a select group of contractors. It means those to whom the contract is offered are a known quantity and saves time getting through tenders. Ms Ower said the distance between office and site was a problem although contact was good. Forseeable problems were sorted out early. A quantity surveyor from Richmond was made the project manager and Ms Ower made one or two site visits a month from Christchurch. Pre planting preparation and weed prevention were thorough.

The project manager oversaw a plant maintenance period of four months. After this time Ms Ower said the client was to hire its own gardener. They were to have a copy of the plans and specifications but Ms Ower did not envisage any further contact with the gardener.

CONTRACTS

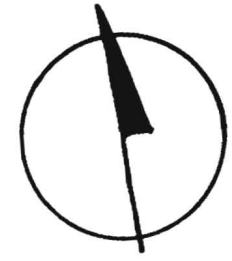
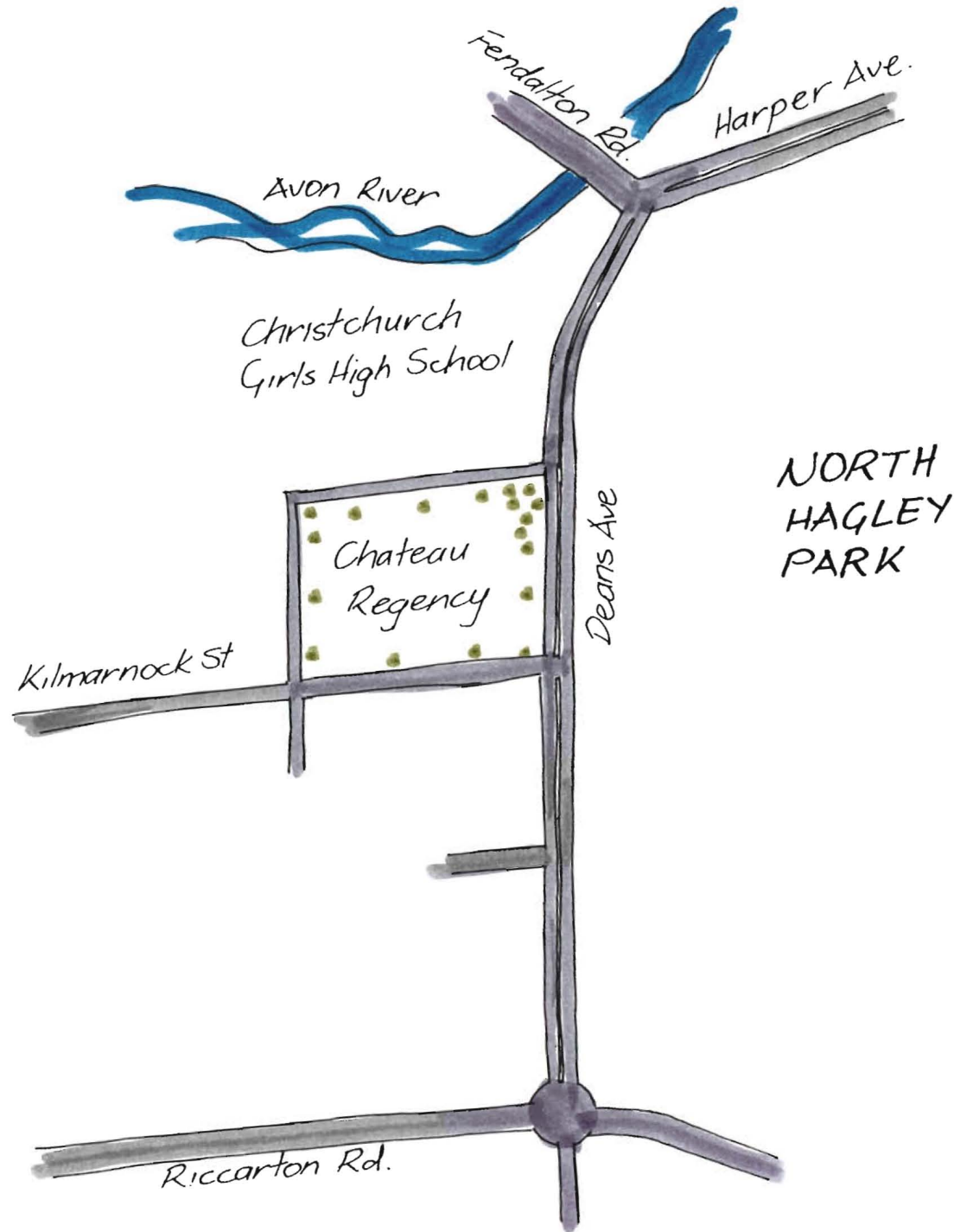
During discussion with Ms Ower the central role of contracts to management and maintenance systems became obvious to the writer.

Boffa Miskell's recommended maintenance period is 12 months. This is bound by contract. In the case of a recent extension to the Chateau Regency (now Quality Inn Regency) a contract for ongoing maintenance guidelines was negotiated. In general Ms Ower said changes such as these must be on the

wish of the client. Lack of knowledge of the benefits was one reason cited for not having a more comprehensive after care system. On a reasonable size project and working for business clients with a variety of aims sometimes landscape work is missed out to a certain extent said Ms Ower.

Occasionally planting was staged she said for example over three different planting seasons but this required three different contracts. But this was costly and disadvantaged management.

Mr Don Miskell, one of the partners of Boffa Miskell, said management was not pushed too hard. This was because it was going to cost the client more money and he or she couldn't see the benefit of it.



map four
The Chateau Regency

2.4 THE CHATEAU REGENCY.

INTRODUCTION

The Chateau Regency (built as the Chateau Commodore) was built in 1975 as a prestigious, distinctive hotel. It is situated on the north side of the intersection of Deans Avenue and Kilmarnock Street (refer map 4). This site has been chosen as an example of the design/management/maintenance relationship in a situation of private development and care. In this case it was built 13 years ago and hence is a good opportunity to see how the design was developed and what after care systems are operating.

The landscape architect was John Morton. The client was the building firm H.P. Holt, who did the construction work. In this case the landscape architect in effect became project manager who hired Peter Beaven as the architect. John Morton also let the sub contracts for the landscape works and Canterbury Landscapes did most of the planting.

To gather information on this case study a long telephone conversation was held with John Morton. From this an interview with Chris Goom, formerly of Canterbury Landscapes, followed. A site visit was also completed where photos were taken. A lengthy chat to the head gardener was combined with a tour around the grounds. Some information on the financial set up was subsequently gleaned from current media reports.



demarcation line between the original planting on the left and the new annuals on the right.

DESIGN AND IMPLEMENTATION

The design stage of the project was outlined by John Morton. He was excited to work on a project where the landscape architect was the project manager.

The first task was an existing vegetation survey and plotting exercise. There were three major home sites that were planted in what Mr Morton described as an "English landscape" style. So the site was well wooded with plenty of mature trees and shrubs. Some of those that have been retained are 3.5 m high rhododendrons and photineas and 8-10 m high lime trees.

Using this matrix, discussion between the landscape architect and architect yielded what they thought was the best siting for the buildings. Mr Morton was also able to influence other exterior factors such as materials, spaces, textures and interfaces.

Mr Morton was also asked to supply and plant all the plants he had specified. Sub contractors (Canterbury Landscapes) were used for the planting and Chris Goom worked on this. His main involvement was planting around existing trees where a lot of ivy was used. He estimated the design had 3 - 5 years to maturity. A maintenance specification was prepared and there was a four month plant maintenance contract.

However Mr Morton was not asked to prepare a management plan.



Suspension of finance stopped development of the area on the right after it had been cleared

One major problem recounted by Mr Morton was the unreliability of finance during the implementation phase. Recent media reports have said that the builder/client H.P. Holt and its bank were in trouble at the time. What this meant on site was a refusal by Mr Morton to take on the next step of work until the money was presented for the expenses. As it happened H.P. Holt was forced to sell the building soon after completion.

But in the finish Mr Morton was pleased with the "strong statement" that had been created.

SUBSEQUENT CARE

In the 13 years since the Chateau was built changes of ownership have been common. The most recent of these was to Magnum Corporation in about May of this year (1988). Changing ownership has meant changing financial regimes as will be illustrated.

A visit to the site, talking to the head gardener, revealed the current state of care for Mr Morton's design. When asked, he couldn't produce a copy of the original plans but said he did have them. Under the previous owners money had been supplied for planting alterations. So changes had been made which in the writer's opinion were visually significant.

The most obvious change was at the main Kilmarnock Street entrance where areas of ivy had been removed and bedding plants (annual flowers) put in its place. Also the



the difference in style between the old and the new.

addition of an ornamental conifer in this same area was confirmed by the gardener.

In the eastern car park which did have, in the writer's opinion, a grove-like feeling, railway sleepers had been added to "tidy it up" (in the words of the gardener).

Another area east along Kilmarnock Street is a half completed project. The gardener had removed the ground cover planting and linked up the shrubs in preparation for new planting. Then the ownership of the hotel changed. Under the new owners no money was to be given for alterations and so this project is left half completed.

There are other areas around the hotel that the head gardener would like to change including the removal of some established shrubs on the road frontage.

When asked how these decisions were made the gardener said he made them on his own. Areas were changed when they began to look "scruffy". These changes were made without reference to Mr Morton the original designer. They were based on what the gardener had seen in magazines and in other gardens.

Mr Morton revealed that he did not like the changes that had occurred, referring to them as "mucky and cluttered". He made reference to the bedding plants, coloured plants and trellising

2.5 CASE STUDY SUMMARIES.

AVONHEAD PARK

1. Multi stage design.
2. Maintenance a matter of course for the institution.
Design and its complimentary management a matter of yearly financial allocation.
3. Stages of design flexible dependent on the existing planted stages.
4. Professional integration an important part of plant choice for new planting and plant replacement.

THE GROYNES

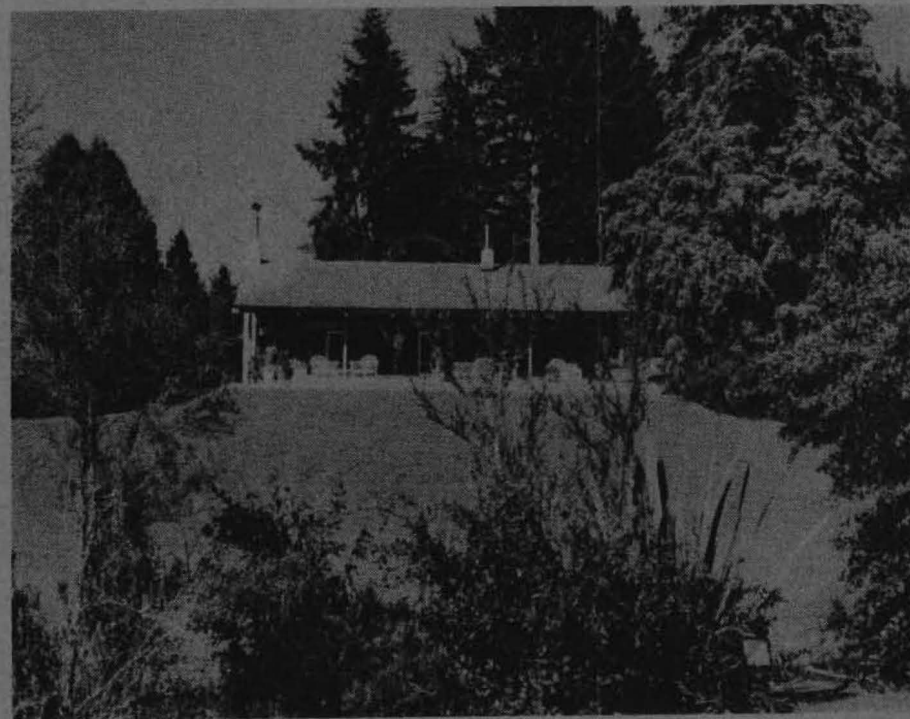
1. Social involvement in the use of PEP and periodic detention workers.
- 2 Design implemented in stages dependent on planting season finance.
3. Original plans kept to be referred to as part of subsequent up-date planting.
4. Planting changes made within the context of the original design.
5. Maintenance including plant replacement linked to design intentions for project.

RICHMOND RETIREMENT VILLAGE

1. Designer's contractual obligations finished at the end of maintenance period.
2. No management plan and gardener hired independent of designer.
3. Client's wishes for design and after care dominated those of the designer.
4. Lack of knowledge of benefits cited as reason for less comprehensive system of after care.
5. Contracts define all work done in connection with design.

THE CHATEAU REGENCY

1. Strong and comprehensive initial design input.
2. Unreliable finance.
3. No management plan or subsequent design input.
4. Since implementation changes of ownership.
5. Design changed without reference to the original design or designer.



chapter three
CASES FROM LITERATURE

3.1 INTRODUCTION AND SUMMARY OF FINDINGS.

INTRODUCTION

There are two main aims for this chapter of the discussion:

- a) Put the case studies in a broader context of design, management and maintenance;
- b) Analyse a wider range of material for a discussion on the relationship of design, management and maintenance.

For this, examples from landscape architecture magazines which gave sufficient emphasis to planting design and its after care were used. This is not a comprehensive literature review. The magazines used were Landscape Design, The Landscape, and Landscape Architecture.

SUMMARY OF FINDINGS

The designs examined in this chapter fall into three main categories with regard to their after care. Using this range of categories it is now possible to place the case studies in a broader context.

The categories of design and after care were:

a) Design for Maintenance.

Here two systems were found. Firstly, an explicit, prescribed system of maintenance. This is in essence a system of management goals set by the designer who then outlines these in maintenance terms for implementation. Examples of this are Christchurch Girls' High School (The Landscape #36, 1988), Hinton House (Browell, 1986), Planting Design (Jackson, 1981).

The second type of system was one where contact and involvement with a design finished at the end of the maintenance period. A long term maintenance regime was not set. Examples of this are the case studies, the Chateau Regency and Richmond Retirement Village, and also Edmonton Park (Landscape Architecture, January 1980).

b) Management by Design.

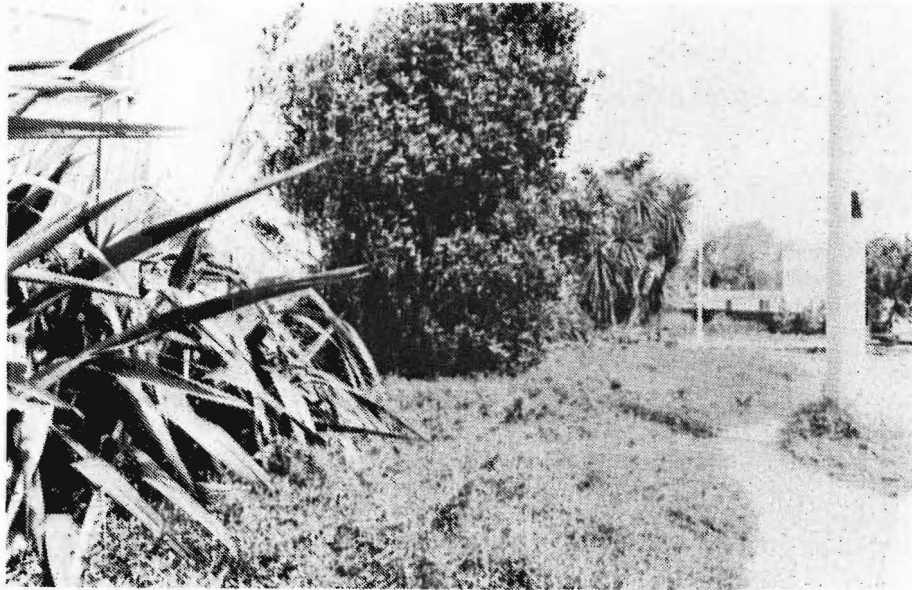
This is a system where there is an ongoing involvement of the designer in the design which creates the management regime. On an established site, or one being established, the designer will return to the site and make a series of decisions based on detailed site information. In this way the design is built up over time. Examples of this are the Avalon Television Centre

(Drakeford, 1980), Huka Lodge (Monzingo, 1986), Forestry Design (Patterson, 1986) and the case studies, Avonhead Park and The Groynes.

c) Design by Management.

This system is one where the main design factor is establishment and management of a plant community on the site. It includes ecological design (Hansman, 1987) but also recognises a spectrum of design involving ecology (Manning, 1980).

Examples here are Oakwood (Tregay and Moffat, 1980), Kirklees Metropolitan Council (Brooker and Corder, 1986) and Cincinatti Urban Forestry (Stirrat, 1986).



a low maintenance planting. (Jackson, 1981)

3.2 CASES FROM LITERATURE.

DESIGN FOR MAINTENANCE

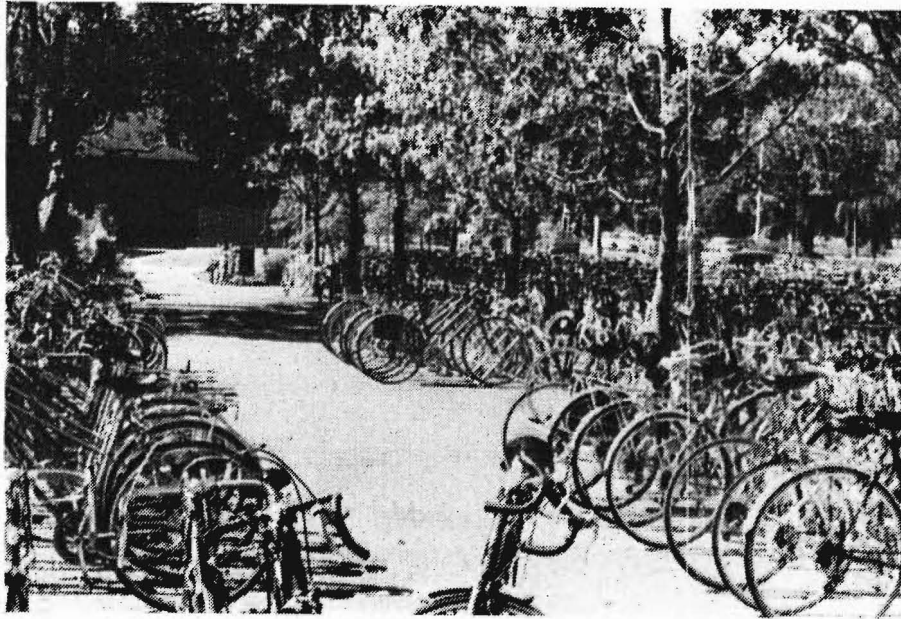
a) Explicit Maintenance.

The first example of explicit maintenance is Ross Jackson's article "Planting Design" (The Landscape # 11, 1981). He cites the need for low maintenance planting due to "labour and fuel" costs.

Low maintenance must be a factor from the design stage, also communication of the intent and techniques to the client is essential. This may not be as spectacular but will have design relevance says Jackson.

Ecological compatibility is important as a natural way of reducing competition. Also density leads to fast growth, less weeds and higher soil moisture. For quick results fillers can be used. It is especially important when the natural or ecological approach is being used that the client is instructed on how to retain the system's natural dynamism.

In conclusion, Jackson says it possible to create good low maintenance planting retaining good design principles with the use of an inventory of local plants and habits.

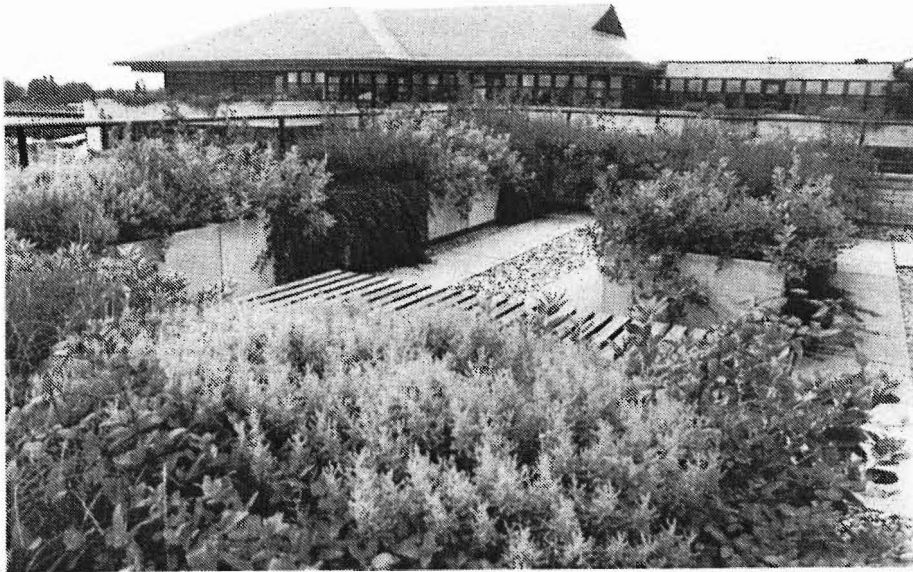


Semi-mature trees to break the scale of C.G.H.S. bike park. (The Landscape, 1987)

The next example is Christchurch Girls' High School which won the G. Malcolm Award in 1987 from the NZILA (The Landscape #36, 1987). The project was the planting design for the school which had been resited next to the Avon next to the north west corner of Hagley Park. The project was contracted out to various divisions of the Works Corporation. The design was chiefly done by Jenny Moore. Of particular relevance to this discussion is the maintenance manual given to the school's gardening staff. In the manual was a guide to each plan's location and instructions for its continued care (refer Appendix 5).

British Nuclear Fuels' Hinton House planting design was also recognised for its high level of design and management (Landscape Design 159, 1986).

From the start it was recognised that the planting must fit the architectural concept. Planting was in three stages. The first of these was shelter planting. Next came a network of close planting for quick affect. One year after the second stage feature plants were placed in what was seen to be their best location. Overall the design was for low maintenance. After implementation there was a two year after care programme overseen by a contractor. Following on from this a full maintenance programme involving a three tiered



Hinton House planting (Landscape Design, 1986)

system radiating out from the buildings, was put in place.

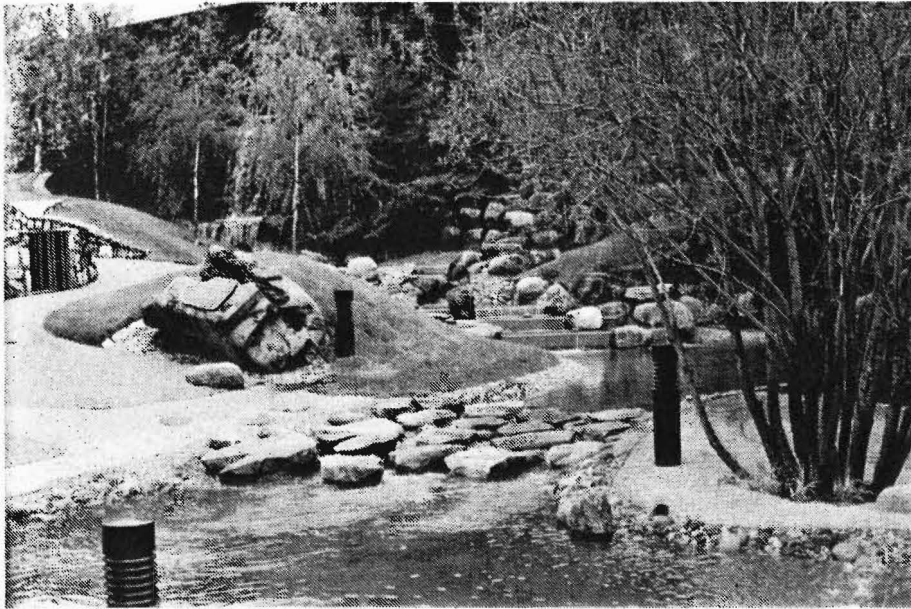
These three examples involve management type goals being translated into maintenance systems by the designer.

b) Non Explicit Maintenance.

Many examples from literature did not outline after care systems at all so it is hard to say what, if anything, had been decided.

One such example of this was the naturalistic park for downtown Edmonton (Landscape Architecture, Jan. 1980). It had a small site and was to be a relief from the bustle of the city. It was supposed to reflect Canada's natural environment. However no mention was made of a management plan. The only reference to after care was that the park would be handed over to the city's Parks and Recreation Department for maintenance.

As stated in the Summary of Findings for this chapter, the case studies the Chateau Regency and the Richmond Retirement Village are in this category also. The Chateau Regency will be used as an example here. No management plan was prepared, at the wish of the client. Maintenance specifications were prepared for the establishment of planting. But since this time the current head gardener has strayed from the designer's



Edmonton Park. (Landscape Architecture, 1980)

intent. The result is what he referred to as "mucky and cluttered" from what he originally called a "strong statement."

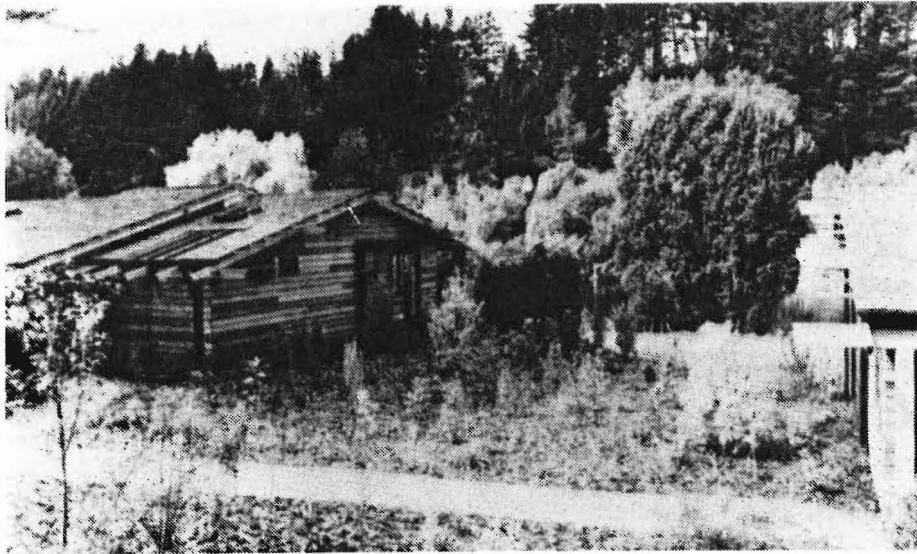
MANAGEMENT BY DESIGN

The first example of management by design to be examined is the Avalon Television Centre (Drakeford, 1980).

It was a difficult site with problems from a strong, salty southerly wind and soil with a shallow hard pan alternating between drought and flooding. The designer decided on a system of three stages of planting over 10 years. He also used what he called ecological planting defining this as "a progression towards a mature landscape which was achieved by careful management and maintenance."

The first stage was to establish shelter using *Eucalyptus johnstonii*, *Metrosideris excelsa*, *Myoporum lactum* and *Pinus radiata*. In the next season (1978) further pinus planting was used to replace and bolster existing planting and the first stage of shrub planting was initiated.

Stages two and three were at the time of the article in the planning stages. Stage two was to comprise thinning of pinus then further planting of ngaio and pohutukawa as well as *Pinus muricata* and *Pinus nigra*. This was planned for 1980/81. The third stage's aim was to make use of micro climates created by thinning of existing trees for under storey and shrub planting. This was planned for 1984/85.



Huka Lodge planting (Monzingo, 1986)

Under new ownership in the early 1980's it was decided to alter Huka Lodge (Monzingo, 1986). Mary Monzingo worked closely with the architects to design and site new accommodation units. Two of the main aims were privacy and access to the Huka River. The project was constructed to a tight time constraint. Now it has been built the owners and managers have the landscape architect back on a monthly basis to write maintenance reviews to ensure the design progresses as intended.

The third example in this group is the account of landscape architects' involvement in the British Forestry Commission (Patterson 1986). As part of an increasing emphasis on woodland care and environmental awareness, an Environmental Branch was formed in 1986. This had a three tiered hierarchy of headquarters, conservancies and districts. This was said to provide flexibility, delegation and immediate response to work.

The head office was at times swamped with work. Also consultant landscape architects were sent to each district regularly. Their job was to supervise landscape work and write design guidelines for the district.

As well as these examples from magazines, the two case studies, Avonhead Park and The Groynes, fit into this category. For this discussion Avonhead Park will be used as an illustration.

In the setting up of this project three stages of design implementation were planned. The second and third stages were loosely planned as concepts. The final design of each was dependent on the progress and development of the stage before. In this way each stage was a progression but based on information from the site to form the final design.

From these studies and written examples, this system of management by design can be seen. It differs from design for maintenance because it used detailed site information for the continued involvement of the designer.

DESIGN BY MANAGEMENT

Ecological design is the most easily recognised single facet of the design by management category. It is the establishment of the indigenous plant community as the main design tool for a site. This is extended by Manning (1982) who said ecological design aims at a "more natural landscape, marked by species' diversity, structural complexity and freedom of growth, and achieved above all by the use of indigenous vegetation sensitively managed in order to exploit natural growth processes (especially successional) and the natural potential of the site." Rettig (1983) identifies Alan Ruff's characteristics of ecological design as "away from technology, away from the emphasis on 'design' in the profession of landscape architecture, and against a particular aesthetic found in some municipal open spaces." He also quotes Ruff as saying "the

INTENSIVE LANDSCAPE =
enclosure, artifice, concentrated human values

EXTENSIVE LANDSCAPE =
openness, casualness, decreasing human values,
increasing natural values.

I - E = MAN - NATURE GRADIENT in its simplest form.

Note relative I - E proportions : inescapable determinants of landscape organisation.

I may be FOCUS or EDGE, or both. But EDGE may also = ECOTONE, zone of natural concentration.
Edge zones may be multiplied, reinforced, interwoven; man-nature gradients may in practice be complex.

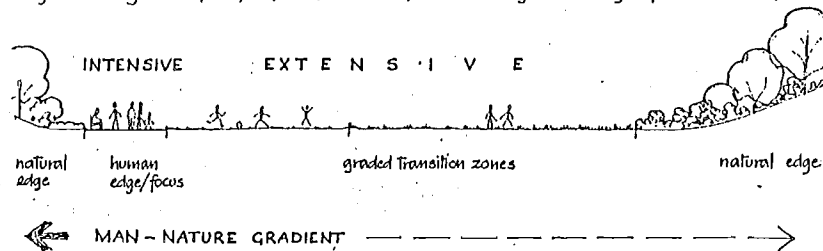


Fig. 5. Intensive-Extensive relationships.

(Manning, 1982)

physical and biological factors of the site should determine the ultimate design rather than man and his muscle."

However this is one end of the spectrum of design by management. It is also possible to involve design more in this system and still remain true to ecological principles. This idea has been formalised by Manning (1982). He states that design must recognise a spectrum of values from human to natural and puts forward the idea of a gradient from intensive to extensive design.

As well as Manning's natural/artificial boundary being subtle so is the boundary between design by management and management by design. At some point one factor would become dominant over the other but this point would vary according to definitions. The examples chosen have design input but use management techniques to attain goals set for the site.

The Oakwood project in Warrington, England (Tregay and Moffatt, 1980) shows an ecological approach to landscape design. The site had been a factory and although some species were regenerating there were soil problems. The aim of the project was to create a new woodland structure with a park system. It was decided to develop the site in three stages.

The first stage was planning of the woodland structure. It was decided to create optional use cells with belts of planting linking up with existing natural vegetation surrounding the site.

The planting benefits were seen to be visual, environmental and to provide the link already outlined.

The second stage was advanced planting and establishment of woodland structure. Planting was done three years before any housing on the site was started. Soil preparation was undertaken using local peat and phosphate.

The third stage was the woodland planting design, maintenance and management. The focus here was on creating interesting edge ecotones and dynamic vegetation associations and structures. Initially a maintenance programme of weed control was used. After three to five years the canopy closed over and a herb layer was allowed to develop. From this point a three phase management system was used building up to a rolling succession plant system. The purpose was to avoid the climax state of the community.

In conclusion the authors pointed to education and communication as important to "protect the investment, by gaining the respect of users". Also the need for creativity based on ecological experience and an eye for the landscape was cited. Using conservation of habitat and species as the first objective, continuity and linkage, careful management and timing of operations were also important.

The Kirklees Metropolitan council (Brooker and Corder, 1986) have been introducing 'natural' techniques of planting. The authors said there was debate in England over using natural techniques in the urban landscape and by local authorities.



Annuals - Kirklees Metropolitan Council
(Brooker and Corder, 1986)

Opposite - urban forestry Cincinnati
(Stirrat, 1986)

However they saw the technique as presenting environmental and social opportunities. They recognised there was a body of public opinion that regarded natural areas as untidy and uncared for as well as attracting undesirables and litter. They saw the main problems of implementation as lack of interest, communication, understanding and, research and development. However they regarded these constraints as more imaginary than real.

The solutions that were happening at Kirklee were, firstly, a designer as the open area manager for the council. The emphasis on communication and understanding were realised by a schools programme and also a programme of education on the new techniques for the council's managers. Research and development programmes initiated included examination of substrate types, direct seeding, tubed seedlings and inoculation of wild types of flowers.

Another local body programme has been undertaken in Cincinnati (Stirrat, 1986). A programme of increasing and revitalising street tree planting was undertaken by the city council. Emphasis in this case was on setting up a financial and labour system that would not need constant injections of public money. Trees were supplied by the city and planted by residents using a general set of guidelines. Once established, money was collected from a new minor commercial tax and the revenue from timber that resulted from tree maintenance. Using

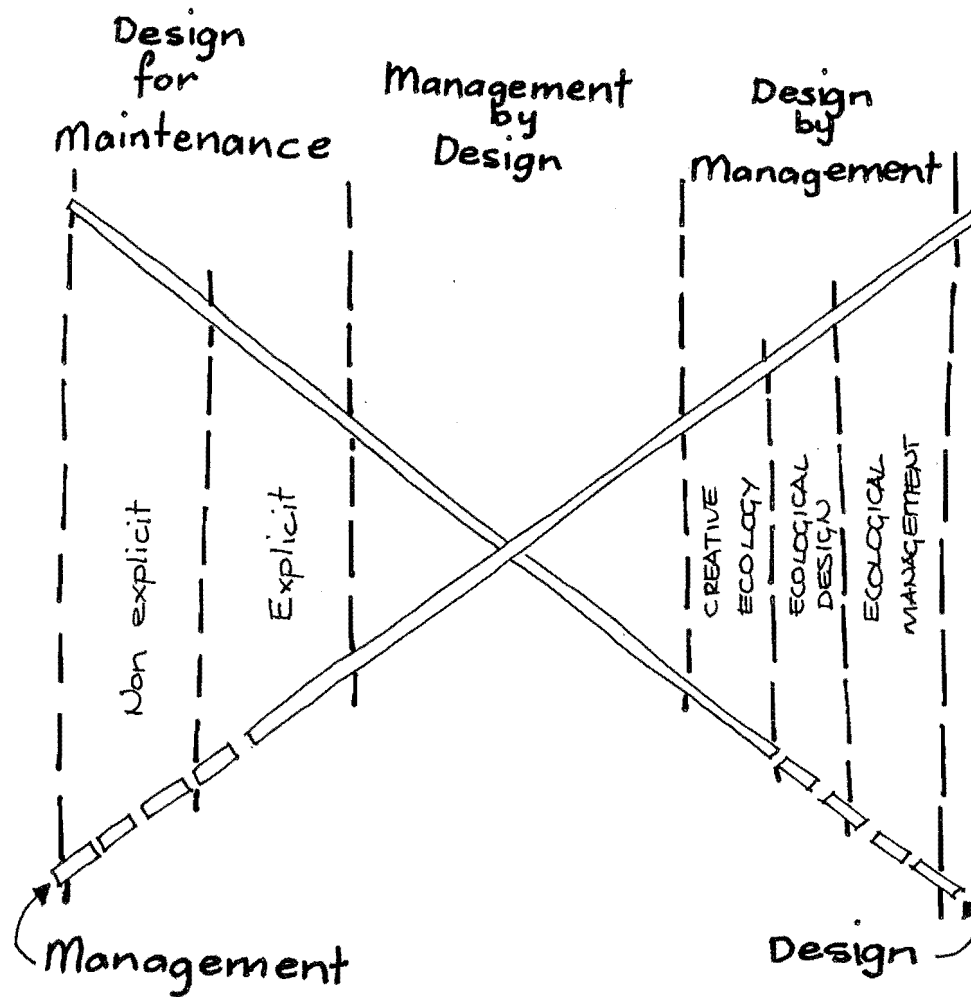


this money, tree gangs were created to care for the trees, prune dangerous trees and undertake general maintenance.

The final part of this category is what has come to be recognised as creative ecology. This emphasises a more design based approach to ecological design and is more towards management by design than pure ecological management. Another reference for this includes Hansman (1987) which deals with ecological design for urban parks.

An authoritative and thorough book called "Ecology and Design in Landscape" (eds Bradshaw, Goode, Thorpe, 1986), already mentioned in the introduction, shows the growth of this approach in Great Britain. It mentions the ideas of creativity and professional integration as central elements. This is witnessed by Kirby's stated "need for creative landscape managers who cannot only understand the characteristics but also develop the potential of particular landscapes". In the same book Cobham favours an "integrated or multidisciplinary" approach instead of an "isolated" one. He also states "landscape managers are generally unable to operate successfully without input from their design and science colleagues."

These variations on the theme of design by management are different from management by design as the main design tool is plant management.



3.3 GRAPHIC REPRESENTATION OF THE CASES

Having described three broad categories of design/management/maintenance relationship it seems appropriate to show how they relate to each other. The easiest way to do this is a simple graphic representation.

This is not supposed to be a comprehensive definition of the relationship but an attempt to represent the cases, in the context of the relationship.

It shows at one end of the spectrum a design dominated approach with a non-explicit maintenance regime. At the other end is a management dominated approach (shown by ecological management) that has a minimal or non-existent design input. The cross-over point which has already been discussed is shown bounded by the management by design approach on one side and the creative ecology approach of design by management on the other.



chapter four
FINDINGS AND CONCLUSIONS

4.1 CRUCIAL FACTORS IN THE RELATIONSHIP BETWEEN DESIGN, MANAGEMENT AND MAINTENANCE.

SUMMARY OF FINDINGS

The crucial factors in the relationship can be grouped under two headings. They are:

- a) **COMMUNICATION** which comprises
 - Feedback
 - Education/Professional communication
 - Explicitness
 - Professional integration
 - Research and development

- b) **CONTRACT** which comprises
 - Financial allocation
 - Control/tenure of land

There is an essential link between these two factors.

Communication is the movement of information between those people involved in design, management and maintenance who have contributed to a project. Thus for a particular project a regime of communication may be set up. Sometimes this will involve designers and maintainers, sometimes only managers and sometimes designers making management decisions. When viewing communication fully the client and/or the user come into the situation. In this way a vertical relationship is constructed up and down the hierarchy.

From this point, the contracts further define the design/management/maintenance relationship because it defines the length of time those involved in design, management and maintenance will be involved in a project. This affects the relationship because as the contract of one of those involved expires, and hence their input is stopped, the relationship between the three parts is changed. If communication was the vertical factor in the relationship then the contract is the horizontal factor.

COMMUNICATION

From the cases presented it seems that communication in this context has five parts. These will be dealt with separately.

1. FEEDBACK.

Feedback is the basic transfer of information concerning a specific project. It is not a causal factor in the relationship. It describes the link between different levels of the hierarchy in a predetermined situation.

Different projects with their own relationship of design, management and maintenance have different regimes of feedback. For example in the Waimairi District Council case of Avonhead Park feedback was an integral part of the system, between the manager and designers and between the maintainers and managers. In the Huka Lodge example, the landscape architect was in effect rehired to provide feedback information each month for the upkeep of the Lodge.

In these situations feedback has been used as an integral part of the system. Other cases show systems where the system was constructed to substitute for feedback by writing detailed maintenance plans. Examples of this are Christchurch Girls' High School and Hinton House (Boswell, 1986). (refer Appendix 5) In other cases there was no feedback but also no replacement of that communication. Examples in this instance are the Chateau Regency and Richmond Retirement Village.

So although feedback is not a causal factor in the relationship it is a useful descriptive term and does define a crucial part of the relationship.

2. EDUCATION/PROFESSIONAL COMMUNICATION.

Education and professional communication can be shown to affect the relationship of design, management and maintenance.

First of all the area of user education has been seen as important in establishing and explaining after care systems. The Kirklees Metropolitan Council (ibid) undertook a schools programme to teach children the workings and benefits of their natural planting areas. In the Oakwood example (ibid) communicators were cited as important to explain the workings of the plant community they had created in order to "gain the respect of the users."

Professional education also seems important. The Kirklees Metropolitan Council used managers programmes of information on their new natural planting techniques to overcome lack of interest and understanding.

Communication from the client has also been shown to influence the after care systems. In the Chateau Regency case no management or maintenance plan was prepared at the request of the client. In the Richmond Retirement Village case the client requested the same situation. The client also requested a fast planting result although the designer recognised the inappropriateness of the solution. In the Huka Lodge case, however, the situation was different and the client requested monthly reviews by the designer.

In the Avalon Television Centre case (ibid) the designer communicated to the client the need for a multi staged planting design. In a similar case the designers of the Christchurch Girls' High School project (ibid) communicated the need for a maintenance plan to retain the design goals of the project.

The case of the British Forestry Commission (ibid) is different again. Here public awareness led to the formation of the Environmental Branch and hence the integral use of designers.

From this it can be seen that education and professional communication do affect design, management and maintenance. The result of communication and education is the appropriateness of the final relationship to the needs (in a professional sense) of those involved in a project. In some situations compromise is reached by those involved and in others the needs of one party dominate.

3. EXPLICITNESS.

Explicitness or the definition of roles and aims can be shown to have an affect on the after care system of a design from the cases.

Firstly, in the case of the Chateau Regency, only gardeners were employed on the site. There was no after care information supplied by the designer. In this case the maintainer's role has changed to manager as he has made what amounts to management decisions changing a number of areas resulting in significant visual impact. Those changes have strayed from the designer's original intention.

In the cases of Christchurch Girls' High School (ibid) and Hinton Home (ibid) this has been avoided by defining maintenance to retain management goals.

Explicitness is the compliment to feedback, being used where involvement in a physical way is finished.

4. PROFESSIONAL INTEGRATION.

Professional integration is another facet of communication that affects the system of after care on a site.

The Waimairi District Council's system of management by design rests on communication between designers, managers and maintainers. In the urban forestry case in Cincinnati (Stirrat 1986) the integration of maintainers and managers was used as well as a distinctive after care system. In the Edmonton Park case (Landscape Architecture, January 1980) no mention was made of the integrating of professions and the park was then handed over to the city's Parks and Recreation Department to be maintained.

In short it seems the higher the degree of professional integration the more complex is the relationship of design, management and maintenance.

5. RESEARCH AND DEVELOPMENT.

Research and development lead to planting solutions to problems that may have previously been insurmountable or expensive.

In the development of natural planting techniques the Kirklees Metropolitan Council has put a lot of emphasis on research and development. Not only planting techniques but mowing regimes as well.

In planting the Avalon Television Centre (Drakeford, 1980) plants that were thought to suit that situation were chosen. Then the plant choice was altered when those best suited were found. The fact that the systems of staged planting and management were used is a result of planting design development.

The Waimairi District Council were involved in ongoing planting development through their system of plant replacement. From this it can be seen that research and development give added flexibility and in some cases define the most appropriate type of design and after care systems.

CONTRACT

1. FINANCIAL ALLOCATION.

The word contract is defined in the Concise Oxford Dictionary as a "business agreement for supply of goods or performance of work at fixed price." In this situation it also relates to the time period over which the performance of work will be supplied. Therefore pertaining to this discussion, as already stated, the contract or contracts define the design/management/maintenance relationship because they define the length of time those involved in design, management and maintenance will be involved in a project.

Contracts are enacted as a result of communication and this can be illustrated using the facets of communication already discussed. For example, feedback is the flow of information between contracted parties.

In the case of professional communication and education, the length of time those people involved in a project are employed for, is an extension of the appropriateness to their professional needs in the project. For example, in the case of Huka Lodge the client felt it worthwhile to retain the expertise of the designer so that the design should develop the way it was intended. On the other side of the coin, in the Richmond Retirement Village case, the designer was only contracted until the maintenance period finished. Presumably this is because his or her need was to minimise the financial input or the designer did not communicate the need for a different contractual set up.

If the roles are not explicitly defined in the contract then those involved may act outside their role in the relationship as happened in the Chateau Regency example. Also, the needs of a client have to be explicit at the start so that the contracts for after care relate to the planting design as espoused by Jackson (1981).

Contracts also define the level of professional integration as witnessed by the Huka Lodge (ibid) and Richmond Retirement Village cases.

Although research and development are not directly linked to contracts as already stated they can lead to greater flexibility in the approach to design, management and maintenance and this would be reflected in contracts.

These are illustrations of the link between communication and contract. In this way the contract embodies the fourth dimension of the design, management and maintenance relationship, which results from the different facets of communication. Having shown this link, it is now possible to go on and illustrate how the contract shapes this relationship over time.

For ease of comprehension three loose groups of contract can be identified from the cases. These are: (a) Simple contract; (b) Complex contract; (c) Non contract.

Simple contract situations are those where the contracts only relate to the design, its implementation and its establishment. In the Richmond Retirement Village the contracted involvement in the project involvement in the project finished at the end of the maintenance period which was four months after the implementation of the design had finished (refer Appendix 4). After this time a gardener was to be hired who was responsible to the client to see the plants were kept in good health. He or she is not contracted to retain the intentions of the designer and in this case she was not contracted to specifically spell these out. This is a similar case to the Edmonton Park example (ibid). In these cases the design is static in that no design decisions have been made to accommodate the growth of plants after the maintenance period.

This point is further illustrated in the Chateau Regency case. The contract set up is the same but the plants have had 13 years to grow and the gardeners have had 13 years in which to make decisions on the planting without reference to the designer's intentions. As has been stated, this has led to significant changes in the planting which the designer feels has strayed from his original design intent. In terms of the relationship between design, management and maintenance this means that after the designer's contractual involvement finished, management decisions were made outside a contractual connection to the design, which significantly altered it.

The second group is that of complex contracts. These involve cases where the designer's intentions are formally outlined in order to accommodate plant growth in a specified way. There are two types of complex contract.

The first of these is where the designers are contracted to write maintenance guidelines. These outline maintenance procedures which form a management regime to retain design goals. Cases examined which use this system are Christchurch Girls' High School (ibid) (refer Appendix 5) and Hinton House (ibid).

The second type of complex contract is where the designer is contracted not only to create the design but then to periodically plan another stage of maintenance or implementation. In the Huka Lodge (ibid) example the designer was contracted to return at monthly intervals thereby tying the maintenance regime down to the designer's intention.

In the Avalon Television Centre example, the designer was contracted to plan and oversee three stages of planting. In this way the design evolved under the guidance of the landscape architect over a period of ten years.

In these cases of so-called complex contracts, systems of prescribed or active management have been set out with a contractual relationship to the design.

The third group is that of the non-contract cases. These apply to the public body projects that have been studied. This is a paradigmatic difference from the two groups of contracts already studied. The work was performed by one large body which did not use contracts to set out the roles of those involved. Instead they are employed full-time by that body and depend on financial allocation without contracts to undertake projects. In the cases involving the Waimairi District Council, design and implementation were dependent on the annual allocation of money and the management and maintenance were carried out as part of the everyday running of the council.

In the case of the Cincinnati urban forestry programme the management and maintenance was dependent on revenue raised by the city and the wood by-products of the programme.

2. CONTROL/TENURE OF LAND.

This second facet of contracts is less thoroughly documented than the first. However, it does bring up another valid point.

In the Chateau Regency case the change of managers and gardeners was mentioned. This case also involved one specific area that was half way through renovation. At this point finance for the rest of the job has been declined as part of the new owner's regime.

This brings up the point of whether new owners are responsible for existing contracts. Although lack of evidence prevents further discussion, this problem does seem worth more investigation. This seems to apply especially at the moment in times of financial uncertainty.

4.2 CONCLUDING DISCUSSION.

The crucial factors of communication and contract have been identified in the relationship of design, management and maintenance. From the evidence presented it can be seen that communication is the flow of information that forms the relationship but contract or allocation of finance ensure that the intentions resulting from the communication are carried out. This means that communication creates the intention of after care but the contracts define the obligation of the after care to that design. This realisation is essential for all planting design.

Apart from the findings that arise directly from the data, this is the most important realisation in this discussion. Intention and obligation illustrate the roles of communication and contract. Also they are a clear way of making sense of the individual factors that affect the after care relationship of a planting design. What result can be shown using the ideas of intention and obligation?

Firstly, referring to the communication section and using the factors outlined therein for analysis, one of two possible results came about. One result of the communication was that the designer's intention was retained for the planting design through the after care system. The other possible result was that the designer's intention was not retained. How then does this relate to the contract types identified?

Those cases where the after care system had no obligation to the original design were those of the simple contract set up. This is illustrated by the Chateau Regency case study. Also this fear was expressed by the designer in the Richmond Retirement Village case. The complex contract did obligate the after care system to the designer's intention. Also in the running of the non contract cases the designer's intention was an integral part of the after care system. It therefore seems that the factors contributing to a simple contract being used provide an important focus for further study. This is essential to accomodate the fourth dimension as discussed as part of planting design in the introduction.

There are several facets of the broader scope of this relationship that have not been addressed for the sake of clarity and with the time restrictions in place. The first of these is the relationship as a product of the site specifically. Different types of site may force different combinations of design, management and maintenance. Also the relationship as a product of its institutional setting has not been looked at. There seems to be a trend to distinct types of communication and contract between public and private institutions. Finally the facet of use or user change might well be addressed as a factor of planting design. However,

having cited these alternative approaches the crucial factors outlined and the conclusions reached in the context of the discussion do provide a starting point for further study.

Apart from conditions outlined above further study can be approached in a variety of ways, using the structure set up by this discussion. Firstly, the relationship may be looked at from a philosophical point of view. Who is the designer responsible to, the client, the user, himself or herself, or the plant community and the greater ecological network? This may be a matter of personal preference but certainly warrants a balanced discussion.

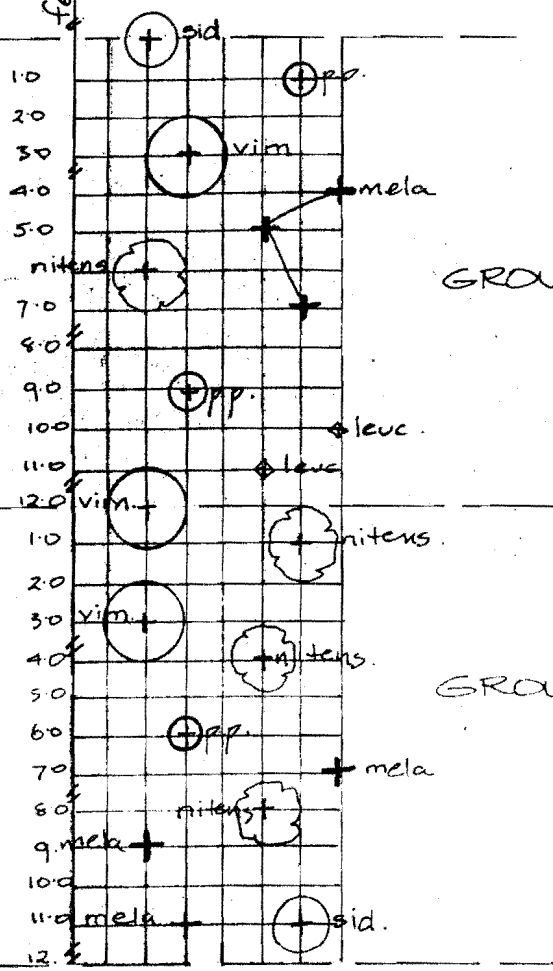
Secondly, using a primarily academic approach, is there a maximum combination of design, management and maintenance? What factors would contribute to this combination and how can it be arrived at?

The third approach is a more pragmatic one. Using the factors already outlined, how can intention best be found and how can this best be realised in contract?

The final question is, can the philosophical, academic and pragmatic approaches all be ideal or maximised in a real planting design?

To further this study is to further the profession of landscape architecture and to become more critical of the cultural heritage we will leave.

fence line



GROUP 'A'

GROUP 'B'

10 20 30 40 50 60 70 metres.

A4

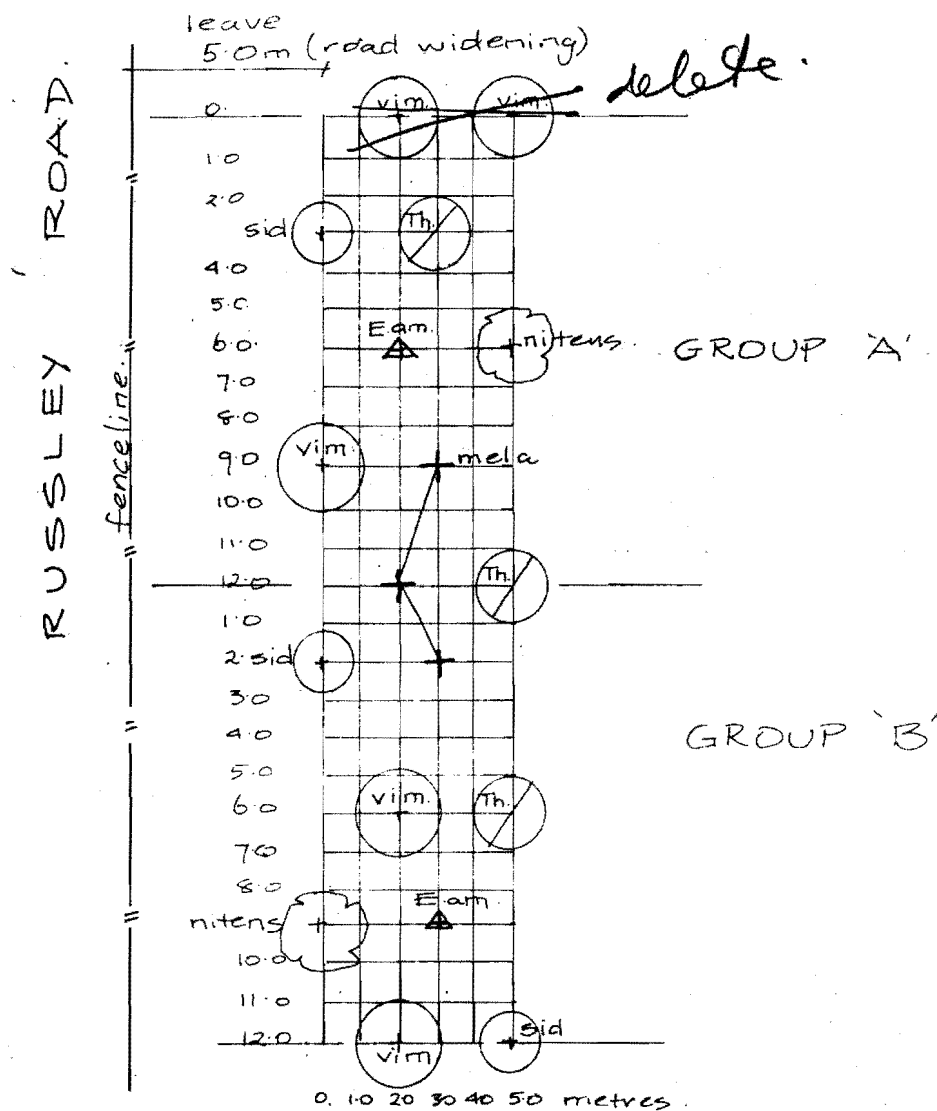
KEY	PLANT NAME	A.	B.	TOTAL
(+)	sid. Eucalyptus sideroxylon 'Rosea'	1	1	2
(+)	pp. Pinus pinaster	2	1	3
(+)	vim. Eucalyptus viminalis	1	2	3
(+)	mela. Acacia melanoxylon	3	3	6
(+)	leuc. Eucalyptus leucoxylon 'Rosea'	2	-	2
(+)	nitens Eucalyptus nitens	1	3	4
		10	10	20



WAIMAIRI
DISTRICT
COUNCIL

AVONHEAD PARK
SOUTHERN BOUNDARY
PLANTING 1987.

NO. LS. 1028
DRAWN • A. Greenup.
DATE • JULY 87
SCALE • 1:200



KEY	PLANT NAME	A	B	TOTAL
(+)	sid. Eucalyptus sideroxylon 'Rosea'	1	2	3
▲	E.am. Eucalyptus amygdalina	1	1	2
(+)	vim. Eucalyptus viminalis	3	2	5
+	mela Acacia melanoxylon	2	1	3
Th.	Thuja plicata	2	1	3
+	nitens Eucalyptus nitens	1	1	2
		10	8	18



WAIMAIRI
DISTRICT
COUNCIL

AVONHEAD PARK

WESTERN BOUNDARY (RUSSELY RD)

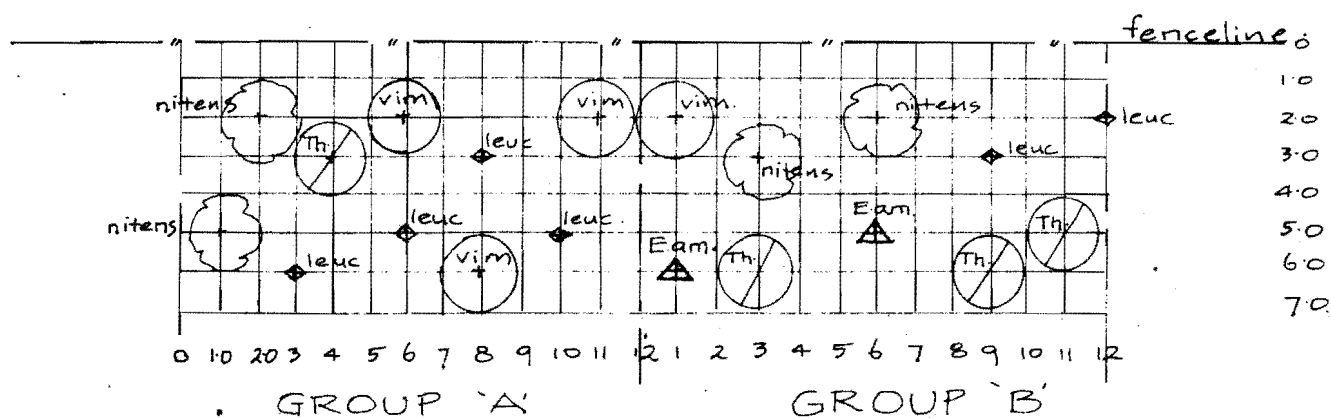
PLANTING 1987

NO: L.S. 1028






DRAWN • A. Greenup

DATE • JULY 87

SCALE • 1:200



KEY PLANT NAME

 Th.	Thuja plicata
 vim.	Eucalyptus viminalis
 leuc.	Eucalyptus leucoxylon 'Rosea'
 nitens	Eucalyptus nitens
 E.am.	Eucalyptus amygdalina

A	B	TOTAL
1	3	4
3	1	4
4	2	6
2	2	4
0	2	2
10 + 10 = 20		



WAIMAIRI
DISTRICT
COUNCIL

AVONHEAD PARK

NORTHERN BOUNDARY (RUSSLEY RD TO CEMETERY)

PLANTING 1987.

NO: L.S. 1028

DRAWN • A. Greenup

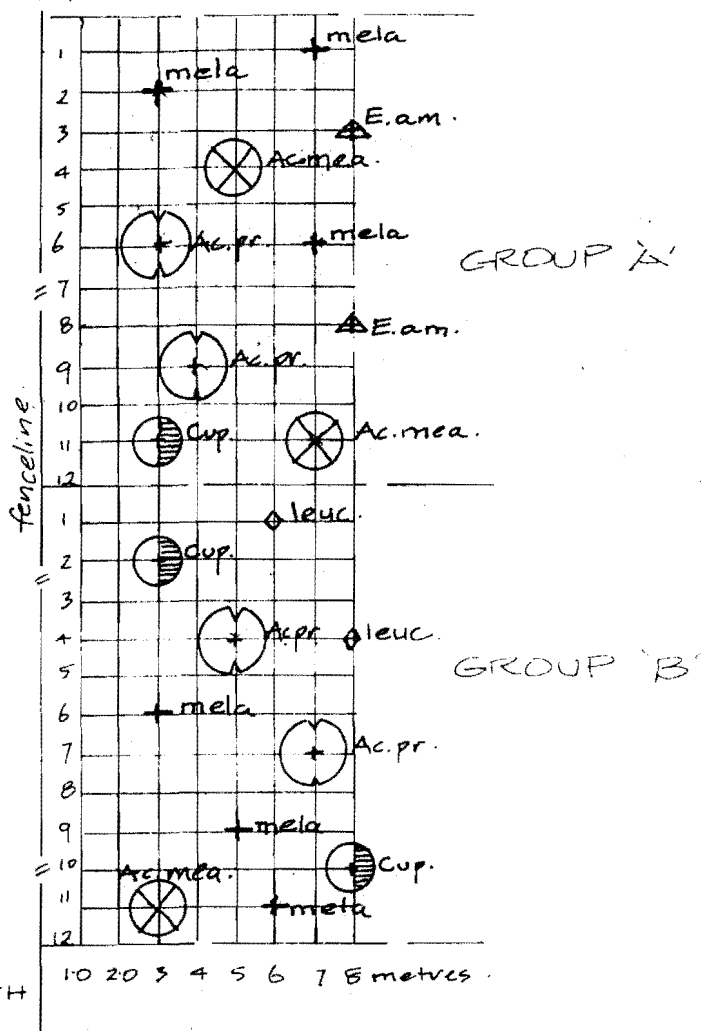
DATE • July 87

SCALE • 1:200.

SOUTH

SECTIONS

RESIDENTIAL



KEY

PLANT NAME

A B TOTAL

+ mela

Acacia melanoxylon

3 3 6

△ E.am.

Eucalyptus amygdalina

2 0 2

⊕ Ac.pr.

Acacia pravissima

2 2 4

⊞ Cup.

Cupressocyparis x leylandii
'Naylors Blue'

1 2 3

◇ leuc.

Eucalyptus leucoxydon 'Rosea'

0 2 2

⊗ Ac.mea.

Acacia mearnsii

2 1 3

10 + 10 = 20



WAIMAIRI
DISTRICT
COUNCIL

AVONHEAD PARK

EASTERN BOUNDARY (EX POWER LINES)

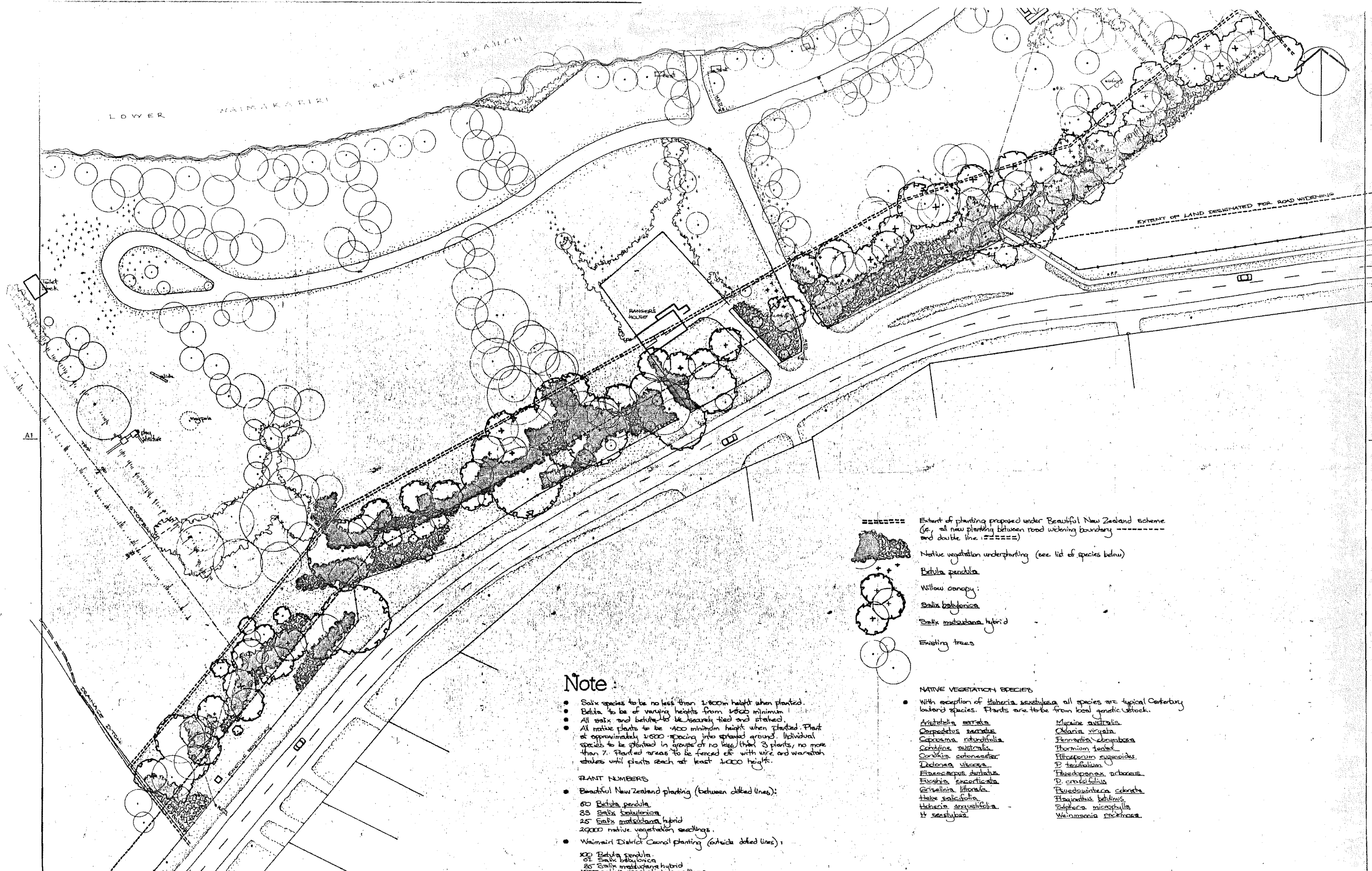
PLANTING 1987.

NO: L.S. 1028

DRAWN • A Greenup.

DATE • JULY 87

SCALE • 1:200



Note:

- Salix species to be no less than 1.800m height when planted.
 - Betula to be of varying heights from 1.800m minimum.
 - All salix and betula to be securely tied and staked.
 - All native plants to be 1.400 minimum height when planted. Plant at approximately 1.800m spacing into sprayed ground. Individual species to be planted in groups of no less than 3 plants, no more than 7. Planted areas to be fenced off with wire and waratach stakes until plants reach at least 1.800m height.
- PLANT NUMBERS**
- Beautiful New Zealand planting (between dotted lines):
 - 60 Betula pendula
 - 25 Salix babylonica
 - 25 Salix matsudana hybrid
 - 20000 native vegetation seedlings.
 - Waimairi District Council planting (outside dotted lines):
 - 100 Betula pendula
 - 60 Salix babylonica
 - 80 Salix matsudana hybrid
 - 10000 native vegetation seedlings.

- ===== Extent of planting proposed under Beautiful New Zealand scheme (i.e. all new planting between road widening boundary ----- and double line =====)
- Native vegetation underplanting (see list of species below)
- Betula pendula
- Willow canopy:
- Salix babylonica
- Salix matsudana hybrid
- Existing trees
- NATIVE VEGETATION SPECIES**
- With exception of Hebe stricta, all species are typical Canterbury lowland species. Plants are to be from local genetic stock.

- | | |
|-----------------------|------------------------|
| Aristotelia serrata | Mycophaea australis |
| Carpodacus serratus | Chamaecyparis |
| Carpodacus serratus | Pennantia cuneata |
| Cordylus australis | Thornian lutea |
| Cordylus australis | Ptilotus sphenolobus |
| Dodonaea viscosa | P. tenuifolius |
| Flacocarpus dentatus | Pseudopanax arboreus |
| Fuchsia excorticata | P. crassifolius |
| Griselinia littoralis | Pseudowintera coccinea |
| Hebe stricta | Flacocarpus dentatus |
| Hebe stricta | Siphocampylus |
| Hebe stricta | Weinmannia racemosa |



WAIMAIRI DISTRICT COUNCIL
A.J.W. LAMB
DISTRICT ENGINEER

DRAWING INFORMATION

SURVEYED	DATUM
DRAWN	BENCH MK.
TRACED	LEVEL BK. NO. P
CHECKED	FIELD BK. NO. P
DESIGNED	
DES. CHK.	
APPROVED	

SCALE
1:500

JOB TITLE

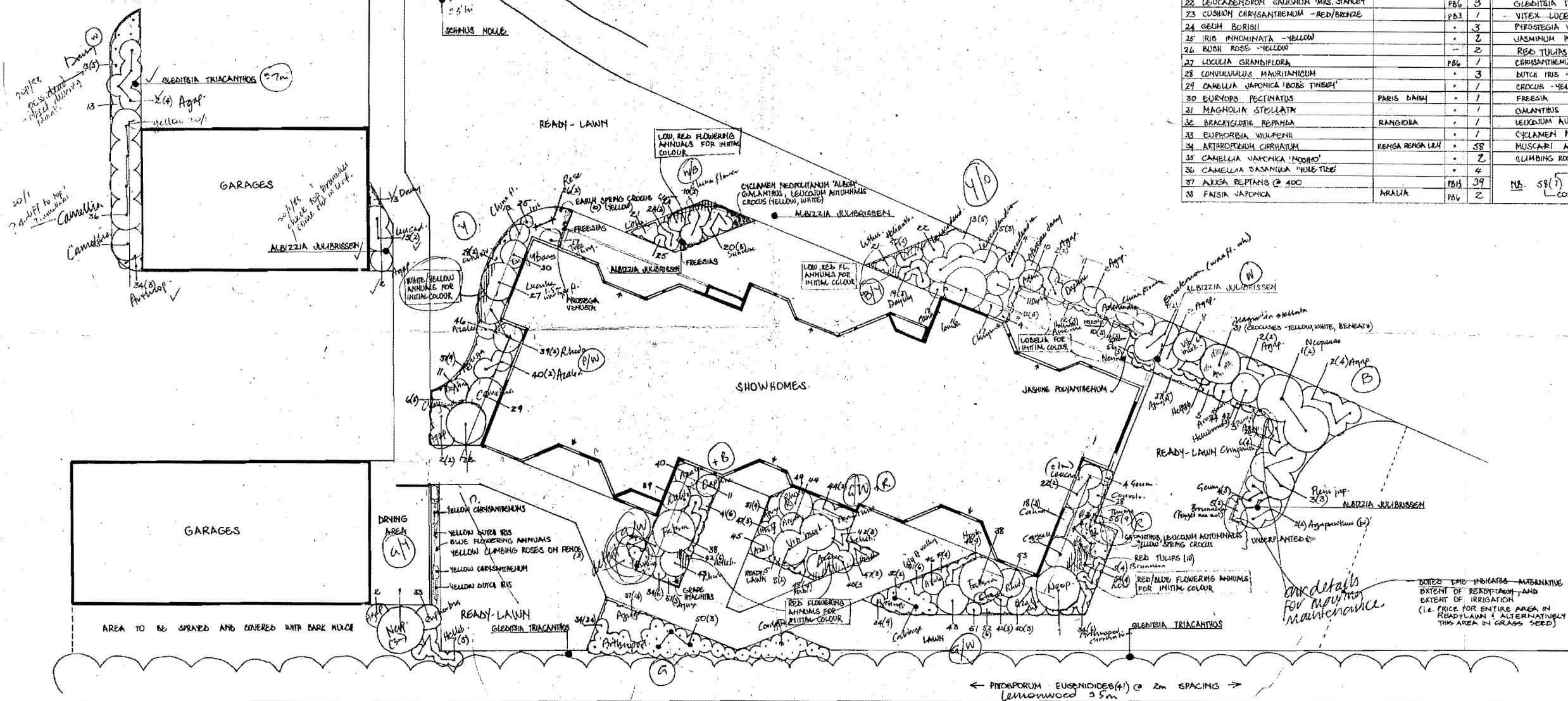
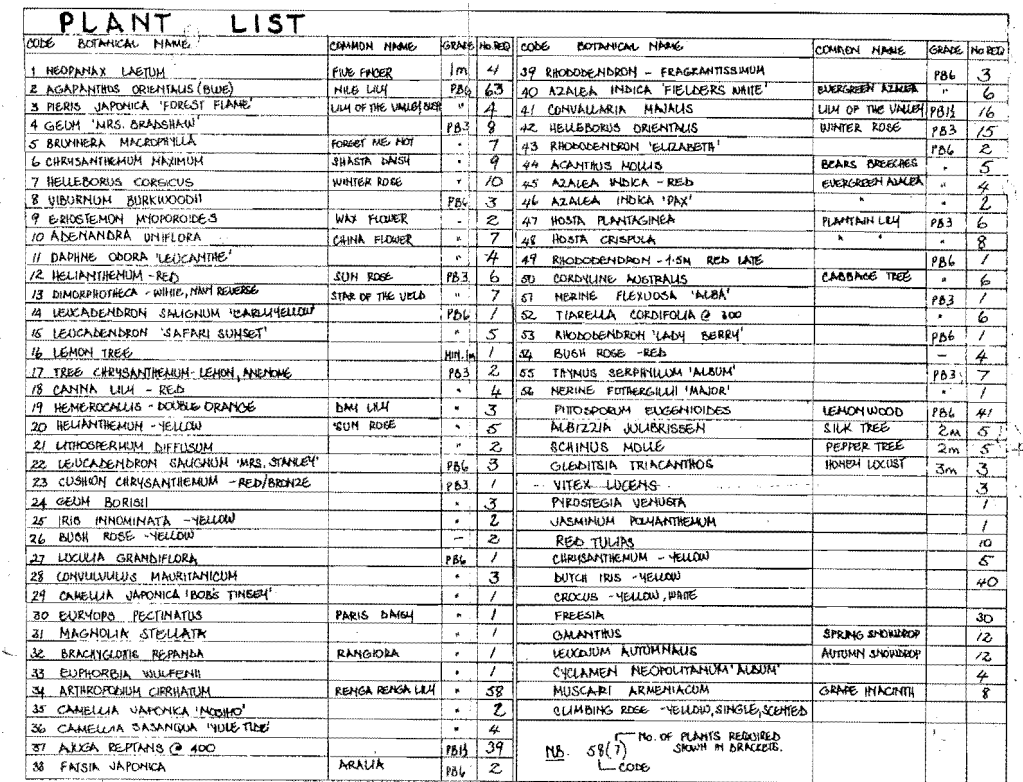
THE GROYNES - Johns Road frontage

DRAWING TITLE & NUMBER

planting proposal for
Beautiful New Zealand

LS 786

appendix three
The Richmond Retirement
Village



- * Specify type and
- * Add linear transformation
- * Kaplan-Meier plot

more details for maintenance

NOTES THIS INDICATES ALTERNATIVE EXTENT OF READYPLANN, AND EXTENT OF IRRIGATION (I.E. PRICE FOR ENTIRE AREA IN READYPLANN + ALTERNATIVELY THIS AREA IN GRASS SEED)

NB: CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

SHEET 2

SHOWHOMES

PLANTING DETAILS

PLANTING

- ~~shade tree~~
 - lemon
 - roses
 - other fl. to pick
 - scented
 - colour groups
- ~~monthly~~ variety / colour
 - annuals for Dec.

RICHMOND RETIREMENT VILLAGE

Prepared by Boffa Miskell Partners Ltd. Landscape Architects. Christchurch. September 1987. Scale 1:100 Ref. No. 3768/1



SECTION 8 - MAINTENANCE

(See also other Trades and General Clauses)

8.1. Scope:

This section of the contract includes the maintenance of the following areas for 4 months from practical completion:

- (a) Turf and grass areas
- (b) Planting areas

8.2 Turf and grass areas:

8.2.1 All areas shall be protected and maintained by watering, mowing, and replacing or resowing as necessary up until the end of the contract period.

8.2.2 Mowing and Edges:

The reel mowers shall be set to 20mm and the lawn cut regularly with a catcher when it reaches a maximum of 40mm high. The edges to the lawn shall be kept tidy at all times.

8.2.3 Weeds:

Undesirable weeds in the turf or grass shall be sprayed with appropriate chemicals strictly according to the manufacturer's specifications.

8.2.4 Topdressing:

The lawn shall be topdressed with clean screened soil to eliminate minor hollows during Spring/Autumn. When the grass is actively growing do not apply more than 15mm of soil at any one time.

8.2.5 Fungal and Insect Attacks:

Spray lawns with appropriate chemicals strictly according to manufacturer's specifications to control fungal infection and insect attacks.

8.2.6 Fertilizer:

Apply sulphate of Ammonia at a rate of 170kg/ha, towards the end of the maintenance period.

8.2.7 Lawn Maintenance does not include:

Re-establishment of grass or lawn areas damaged by vandalism or motor vehicles.

8.3 Planting:

8.3.1 All trees, shrubs, groundcovers and other plant material shall be protected and maintained up until the end of the contract period.

8.3.2 Maintenance shall include replanting, checking of watering system, restaking, weeding, cultivating, removing dead material, re-setting plants to proper grades or upright positions, control of insects, fungus and other diseases, noxious animal control and generally keeping the area neat and tidy.

8.3.3 Weed Control:

Every effort should be given to maintain an adequate mulch in conjunction with the careful use of pre-emergent herbicides, strictly in accordance with the manufacturer's specifications, so reducing the need for excessive hand maintenance.

8.3.4 Guarantee Period:

This shall be for the total extent of the maintenance period of the soft landscape.

8.3.5 Garden Maintenance does not include:

- 1) Replacement of plants damaged by vandalism, spillage of fuels or chemicals, or vehicles.
- 2) Any alteration, addition to, substitution of planting or plants requested by the Principal.

8.4. Inspection and Provisional Acceptance:

8.4.1 The Landscape Architect shall be contacted to inspect all work for provisional acceptance upon practical completion of the work.

2.10.87

8.5 Final Inspection and Final Acceptance:

8.5.1 At the end of the maintenance period, inspection of plants will be made by the Landscape Architect upon written notice requesting such inspection submitted by the Contractor at least 10 days before the anticipated date of inspection.

8.5.2 Any plant as required under the contract that is dead, not true to name or size as specified, or not in satisfactory growth as determined by the Landscape Architect shall be removed from the site and replaced.

8.6 Rubbish:

8.6.1 All rubbish, excess stakes, planter bags and undesirable debris, resulting from planting operations shall be removed from the site by the Contractor.

8.7 Damage:

8.7.1 Any vehicle compaction marks caused by the landscape contractor or his sub-contractors in the turf and grass areas shall be made good by the Contractor.

1.0 INTRODUCTION

- 1.1 The aim of this manual is to provide concise notes for the general maintenance and management of the grounds at Christchurch Girls' High School in Matai Street.
- 1.2 Notes are provided to give guidance for promoting healthy growth of all existing and new planting and grassed areas, plus maintenance of the new watercourse.
- 1.3 When design or specialist advice is required concerning the removal of trees or shrubs or deviation from the original design concept - the Environmental Design Section of the Ministry of Works and Development should be consulted.
- 1.4 The landscape development of the school has been designed to create minimal maintenance. The installation of an automatic watering system around the school buildings and on the playing field will reduce the number of man hours required for watering this area but also ensure that water is available to plants and grass during dry seasons.

2.0 MAINTENANCE REQUIREMENTS

- (a) The report is divided into sections which refer to vegetation type (as indicated in Figures 1, 4 and 7) rather than describing each area individually.
- (b) Planting plans are included to give an idea of the specific location of plants and are to be used as a guide when replacement plants are required.
- (c) Diagrams showing the method of pruning trees and shrubs are also included in the report (see Figures 3 and 5).
- (d) At the end of the report a list is given identifying specific maintenance activities required throughout the year.
- (e) Semi-mature trees by Deans Avenue and the front entrance were planted September 1985 and the remaining trees and shrubs were planted June - August 1986.

Sheet 3 - Matai-Gymnasium Frontage

Pin Oaks (*Quercus palustris*) as standard trees have been planted here to complement the semi-mature Pin Oaks (*Quercus palustris*) in Matai Street. Check these for even growth; prune and shape where necessary. (Figure 3.)

Sheet 4 - Area west of the Main Teaching Block

Three semi-mature Ash trees (*Fraxinus excelsior*) are planted in the paved area. Retain and protect these trees. Check broken branches and trim where necessary. During autumn months remove wind blown leaves to avoid contamination of the adjacent swimming pool.

Sheet 6 - River Avon side of Art and Craft Block

Groups of Common Alder (*Alder glutinosa*) as large whips have been planted along the river bank. These trees are to be treated as coppice by regularly cutting them back every 5 years. Check for growth and overcrowding. Cut back to 2 m high every 5 years.

Sweet Gum (*Liquidambar styraciflua*) as a standard tree is planted on the south side of the sculpture court. Retain, protect and check for even growth.

Sheet 7 - Lower Watercourse

Sweet Gum as a standard tree planted alongside the footpath. Retain, protect and check for even growth.

Sheet 8 - Irvine Street

Wych elm (*Ulmus glabra*) as standard trees are planted in an avenue either side of the street. Black walnut (*Juglans nigra*) have been omitted from this formation. Check these trees for even growth, when overcrowding starts to occur it will be necessary to remove some of these trees and to ensure that an even spacing is retained. Contact Environmental Design Section of the Ministry of Works and Development for guidance on removal of trees.

Dawn Redwood (*Metasequoia glyptostroboides*) planted in a group of three on the north side of the tennis courts. Check these trees for even growth after establishment, retain the best looking specimen and remove two.

Scots Pine (*Pinus sylvestris*) in a group of five. Check growth and remove weaker specimens after 5 years (1991).

4.1 Front Entrance

- (a) Refer to sheet 2. Herbaceous plants that give a bright show of colour are to be planted in the circular planter bed annually.
- (b) A different species can be used each year. Initially the bed was planted with bright red geraniums (all the same colour) to provide contrast to the building in an area which is predominantly in shade. These plants will not tolerate frost and therefore have to be uplifted for the winter months and replanted in the spring. Herbaceous plant material can be propagated for use in this area or purchased from a nursery.
- (c) Suggested plants to use as an alternative:

Salvia coccinea

Tagetes erecta 'Orange Jubilee'

Nasturtium - mixed colour

Cherianthus (yellow variety-wallflower)

- (d) If continual maintenance in this area is a problem, alternative plants could be used which require less attention.

Bergenia sp

Agapanthus

Hypericum calycinum (preferred because of its bright yellow flowers).

These plants would provide all year round cover and maintenance would be minimal. *Bergenias* need to be thinned out occasionally as do *Agapanthus*. *Hypericum* can be cut back quite severely to keep under control.

Whichever plant is selected, the whole bed should be planted out with the same species to achieve a strong splash of colour.

4.2 Herb Garden

- (a) Refer to sheet 4. An area on the north side of the Biology Court has been allocated as a herb garden - it is close to the west door of the main teaching block and easily accessible from the Home Economics Room. A range of herbs have been planted: bergamot, lovage, yarrow, rosemary, bay, catmint, tarragon, parsley, marjoram, sage, chives, lavender, lemon thyme, and thyme. Keep this area weed free, by hand and replace dead plants with same plant, particularly the annuals.

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