

BRICK PAVING IN A LANDSCAPING PLAN

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1. INTRODUCTION

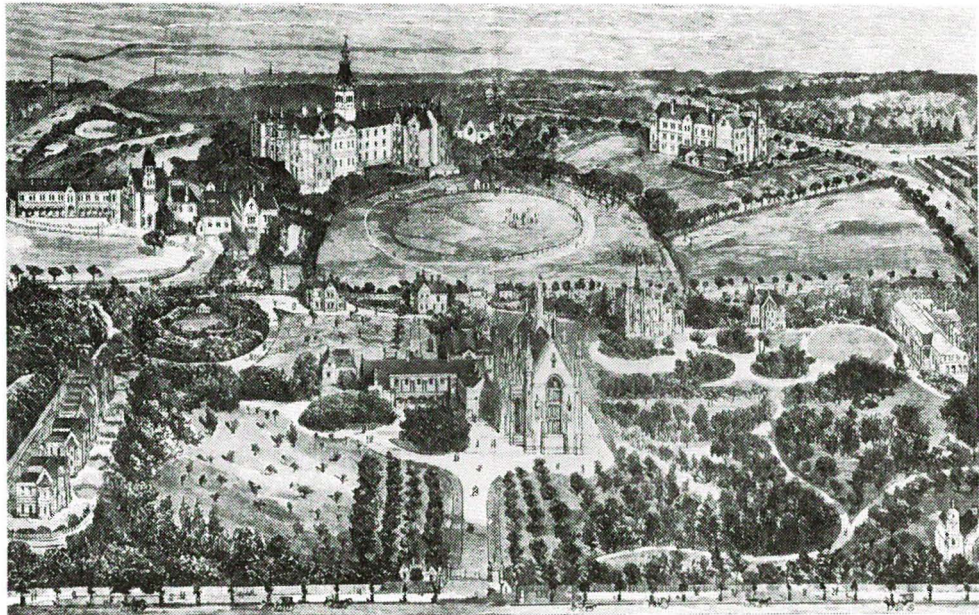
The University of Melbourne's site has been the subject of a dramatic revival in the last twelve years. The transformation of the site has been achieved by landscaping. Integral to that landscaping plan has been the use of brick paving. The details of that plan and the advantages of brick are the subject of this paper. The development of the plan and its implementation result from the successful University of Melbourne Master Plan 1970 (by Bryce Mortlock - one of the authors), the Landscape Elements Report - part of the Master Plan, and the work of the University's Grounds Committee (in today's parlance - one Committee which did not produce a "camel").



2. BACKGROUND

In 1969 the University of Melbourne desperately needed a "Plan". Particularly a Master Plan to govern development but also specifically a plan to give a site - which needed to be rescued from the hands of a series of building contracts - a feeling of homogeneity, coherence and atmosphere. The atmosphere of a great University - of belonging, of building and site relationship - did not exist.

In the 1850's the site had been rescued from its then use as the your city's rubbish dump; to a garden environment in which the University's first buildings had been placed and in which the citizens strolled on a Sunday afternoon.



The activities of intensive building of the 1950's and 1960's had destroyed that garden setting and left a series of buildings of differing architectural styles and finishes contributing to an environment of disharmony.

Under the guidance of Vice-Chancellor - Professor Sir David Derham and Vice-Principal - Ray Marginson (both recently appointed), the Grounds Committee was re-formed and one of these authors (Bryce Mortlock of the Sydney firm of Ancher Mortlock Murray and Woolley) appointed as Master Planner. The Grounds Committee was initially chaired by Professor John Turner and during the greater period described, by Professor Carrick Chambers.

The Master Plan and the companion report "Landscape Elements Report" gave recognition to the role which landscaping and paving would play in further development and recovery of the site:-

"The overriding objective of the Grounds Sub-Committee was to arrest the process by which a once great landscape had fallen into decay. To do this, it was necessary to recognise first of all, that the expansive park-like landscape of the past was gone forever. Relying as it did on broad acres and isolated structures, it had long since given up the struggle against the encroachment of buildings and bitumen. A new approach was needed; a new landscape policy related to the Master Plan concept of courts "as outdoor rooms" accepting the reality of surrounding buildings and using them to advantage."

Master Plan Report 1981 - page 36, para. 1.5.2.

"Paving

It was recognised from the beginning that the adoption of a uniform, modular basic paving material would be one of the most effective means of linking the great diversity of spaces and architectural styles and of giving some unity to the University grounds."

Master Plan Report 1981 - page 42, para. 1.5.6.

This aspect will be dealt with in more detail in the technical sections of the paper.

Two further quotations from the Master Plan Report (update) 1981, are important. Page 39, para. 1.5.4:-

"For it (the Master Plan) showed unequivocally where new building might not take place. The open spaces thus designated were therefore available forthwith for long term landscaping planning."

" - no aspect was neglected, from planting and paving to signs, outdoor furniture, fences, railings, lighting. However, the most important unifying influences have come from the first two elements, planting and paving."

These paragraphs are used to demonstrate the very prominent part played by brick paving in this landscaping revival of the University's grounds.

3. EXTERNAL RECOGNITION

The success of the landscaping reconstruction of the University site has been received with great pleasure and satisfaction by the University community. Many people, who used to be ashamed of their University environment, now speak with affection about their ability to wander along pleasant brick paths, amongst trees and birds, and admire pleasant enclaves.

The impact and extent of the improvement has also been recognised externally to the University.

The first recognition came from the Victorian Chapter of the Royal Australian Institute of Architects; which awarded their 1981 Medal for Community and Urban Design to the University and the Master Planner (Bryce Mortlock) for the success of the Master Plan project and the environmental design of the grounds.

In part, the citation read -

"It has been an extraordinary achievement to have overcome and unified such a hostile and piecemeal environment with such simple design devices, as brick paving and consistent detailing."

The second major external recognition came from the Official Journal of the Australian Institute of Landscape Architects' "Landscape Australia" in the August, 1980 issue.

The Editor's comment on the issue was "...Those who find themselves responsible for buildings and open space, both public and private, frequently inherit the results of previous bad planning, resulting from ad hoc decision making, tunnel vision, myopia, politics - and so on.

Sometimes the results are so daunting that those who follow are inclined to give up in despair and become resigned to the situation.

This article shows what was done by a small dedicated group who worked within the framework of a well made master plan that looked beyond the immediate future. They faced up to the task and achieved a remarkable transformation in a period of about ten years. Posterity should be grateful to them.

There are lessons here for all those who look after land and buildings, perhaps in the 'suburban limbo' or the industrial wilderness, whether councillors, municipal officers, committees of management, or company directors."

This article was reprinted by the University and included a separate article on Brick Paving at the University of Melbourne; this will be separately referred to later.

4. THE PLACE OF BRICK PAVING IN THIS PLAN AND RECONSTRUCTION

Having described the need and success of the Master Plan and the landscaping reconstruction of the University of Melbourne site; it is now necessary to move to describe and detail the place of brick paving in this success story.

We have already indicated that the two major unifying elements in the Landscaping Plan were "planting" and "paving". The other elements were items of landscape furniture - seats, lights, fences, bicycle racks, bollards, and rubbish bins.

The element of relevance to this paper is of course brick paving.

5. WHY BRICK?

Paving was considered in relation to five principal classes of surface, each with its appropriate paving type.

The classes considered were:-

Major Vehicle Roads - areas where pedestrian use would be discouraged.

Minor Vehicle Roads - pedestrians share the use of these roads.

Major Pedestrian Routes - walkways linking all precincts and major buildings.

Minor Pedestrian Routes - related to particular buildings or for pedestrian service access.

Outdoor Living Areas - courts, quadrangles, landscaped places - the Master Plan's "Outdoor Rooms".

Existing Paving

A survey of the University showed that the existing predominant material was brick in either red, yellow or grey .

Other existing materials were concrete, bitumen, slate, sawn bluestone, and bluestone pitchers.

Consideration of Paving Materials

The 1970 Master Plan Report and Landscape Elements Report urged that:-

- paving is generally considered more attractive if in small units - flags, tiles, bricks, setts - of regular shape
- the standard brick size (9" x 4½" x 3") appears to be cheapest to buy, and the cost of laying would not make any significant difference. Concrete tiles or flags with cement surfaces are probably cheaper, but not so attractive, and the surface has a tendency to warp
- the recommendation of this paper is that the major pedestrian routes be paved in face brick on flat generally (on edge for special purposes) in stretcher or quarter bond to reduce cutting
- brick colour should be decided after research into available brick types, with particular reference to wearing quality, susceptibility to organic growths, and to brick expansion
- brick was also recommended as a surface for minor pedestrian routes and for minor vehicle roads, but with appropriate sub-base for road traffic. (More details later.)

6. BRICK COLOUR

After inspecting brick paving already laid in Melbourne, e.g. Moonee Valley Racecourse; a number of sample panels were laid on the campus.

The final choice selected is the "Clifton Grey" - a beige coloured brick used extensively in Melbourne buildings and, on edge, giving a remarkably even colouration. However, as paving materials, we generally use it on face and achieve considerable colour variation. Our specification requires that our bricks are taken from particular areas of the stacks in the kiln where the firing interacting with the clay feldspars gives flashes of colour in a percentage of the bricks.

When Clifton phased out oil burning kilns and changed to gas, it became necessary to ask Clifton's to use splashes of oil on the bricks before firing; to achieve the same result.

An important aspect is that Clifton is a major company and the "Clifton Grey" is a very popular housing brick. It should remain available for many years.

7. METHODS OF LAYING AND SPECIFICATION OF SUB-BASE

Master Plan Report 1981 sets out the principles "...The brick (paving) is usually laid on flat in stretcher bond, but different bonds and patterns, including edge laying, are used to create interest in special areas.

The paving is laid on a sub-base of stone aggregate such as is normally used as the structural road base under flexible bituminous pavements. By increasing the depth of the sub-base the brick pavement can be made to take heavy vehicle traffic loads where necessary; for example emergency vehicles - fire engines, ambulances - and earthmoving machinery for landscape works.

Brick roads in Holland and Germany have traditionally been built this way."

Specifications for Sub-Base

The decision was also taken to lay the paving bricks on a porous sub-base with unmortared joints. The advantages seen in this are:-

- much cheaper to lay; pointing of joints in paving is an expensive hand process
- allows easy lifting and replacement where necessary; for example to get at underground services or correct uneven settlement. Access to underground services is particularly important in an old site such as this University - we do not have the services tunnel common in new institutions
- run-off is reduced; this in turn produces a number of advantages -
 - it enables size of stormwater drains and channels to be reduced, and in some cases eliminated altogether, with consequent cost savings. Peak loads and flooding are also reduced
 - grading to falls is less critical and ponding due to faulty grading or hollow surfaces is reduced or eliminated
 - it allows run-off water to get into the ground to replenish subsurface water; particularly important in the vicinity of planting

(especially during a period of water shortages in Melbourne)

- other advantages follow later.

The only obvious disadvantage is that irregularities in units cause open joints in which weeds can grow.

It is usual however to fill joints by sweeping with sand (with or without a dry stabilizer). Weeds may still grow in the joints, but their control is not difficult.

Sub-Bases and Levelling Layers

It is standard practice to lay unit paving on a levelling layer of sand, which should be of a thickness sufficient only to allow adjustment for levelling; 2" (50 mm) should be the maximum.

Below the levelling layer, a structural sub-base is usually necessary, depending on the nature of the sub-soil and the loading. Engineering advice is usually obtained where vehicle access is likely. In some cases (pedestrian access only) compacted natural ground will be sufficient in itself. Otherwise the porous structural sub-base should consist of rock aggregate as used for road base under bituminous vehicle road surfaces, compacted by rolling in the usual manner.

The thickness will be designed for the loading ranging from 4" (100 mm) minimum, rising to 12" (300 mm) where there is likely to be heavy vehicle loads on poor soils.

An important aspect is that this construction, with a brick surface, supports vehicle loads (even fire engines) without resorting to reinforced concrete, which would make access to underground services very difficult.

Stabilization of Sub-Base

The initial specifications called for stabilization of the levelling layer of sand with the addition of dry cement. The sand used is a heavy granitic sand which (even 'stablized') allows water to penetrate to the ground below.

However, this practice has been questioned recently and it became obvious at a Sydney seminar in the last year, that there are two schools of thought on stabilizing the sand bedding layer with cement or lime. It has been suggested that there may be no engineering justification provided the bricks are thick enough and strong enough, which they are. There is a big container wharf in Melbourne entirely paved with concrete brick-sized panels laid on a sand bed.

One danger in stablizing is that the calcareous products (cement or lime) are liable to be leached out of weak mortars or concretes and can form calcareous deposits on adjoining surfaces or on the surface of the paving itself. In paving laid over porous fill on the ground as in this case; the leached material, if any, probably goes into the soil unnoticed, but in paving laid over impervious bases (such as roof slabs) it frequently appears as 'stalactites' around the edges and as a 'bloom' on the surface.

The matter is currently being re-examined.

8. AN EXTERNAL VIEW - "LANDSCAPE AUSTRALIA"

The already mentioned article on the detail of the brick paving at the University of Melbourne - "Landscape Australia", September 1980 - provides an interesting and valuable external view on the details of the brick paving. With permission of the Editor, it is attached as an appendix.

9. TREES IN PAVING

Of importance to the major thrusts of the University's landscaping philosophy, is the need to plant major trees in the principal walkways.

With reinforced concrete sub-bases or paths, the growth of major trees usually creates considerable difficulties. Root growth will raise heavy re-inforced slabs and then a very expensive operation is necessary to remedy the problem. This University has examples of that difficulty.

With brick paving on a sand or crushed rock base, it is relatively simple and inexpensive to lift the bricks, cut back the root and replace the surface. Professors Walk, planted by "Cyprus Planes", has already been the subject of several repairs of this nature (without any ongoing evidence of the problem).

10. OTHER PAVING MATERIALS

The University has not confined its interest in paving to brick. In special enclaves, courtyards, areas of special interest; sometimes brick is used but other materials - bluestone, sawn bluestone, slate, concrete, and even bitumen, is acceptable.

However, brick is the dominant material and is used on all major walkways. Brick is the material which has provided the unifying element (with other landscaping elements, such as planting and furniture), which has transformed the campus.

11. BRICK PAVING IN THE UNIVERSITY OF MELBOURNE LANDSCAPE

The University, its Grounds Committee and Master Planner therefore pay tribute to the impact of brick paving on its landscape and environment and hope this paper provides a sufficient background to this success story.