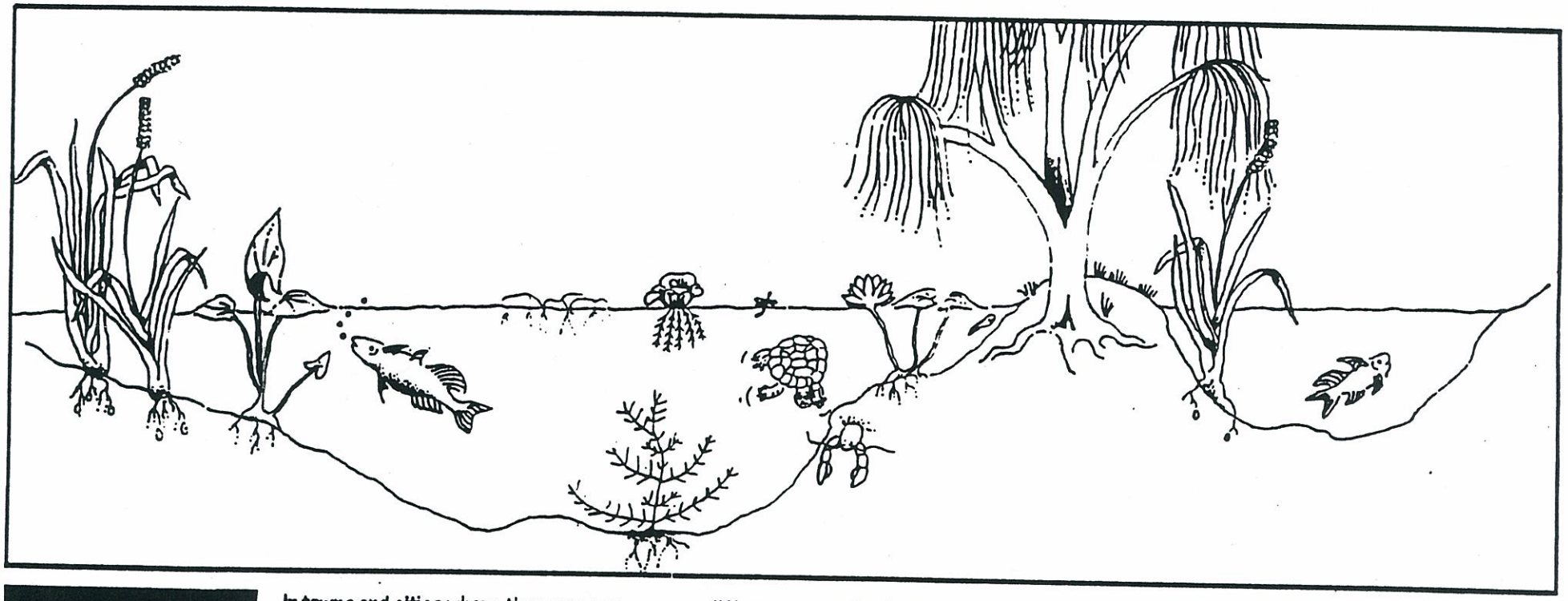


the URBAN WATER CYCLE

In towns and cities where there are many roads and buildings the natural water cycle is greatly changed. More water flows over the surface and less water is absorbed into soils. Water flows very quickly in concrete pipes and drains, while in the original meandering creeks water flows slower. Often floods in urban streams are higher when there are more roads and buildings.

Many urban creeks and rivers are polluted. Point sources of pollution often occur from factories and sewage works. Rainfall runoff from roads and the roofs of buildings are a diffuse source of pollution.

In Sydney waterways, the major source of pollution is sewage overflows. When there is heavy rainfall, water leaks into sewerage pipes. If the sewerage pipe fills up with rainwater, the excess sewage overflows into creeks, rivers and Sydney Harbour. After heavy rain, people should not swim in Sydney Harbour because of sewage pollution.

We should aim to bring back nature into urban waterways. In the home garden, water absorption into soils can be improved. Plants can be grown to help protect garden soils and to encourage soils to absorb water.

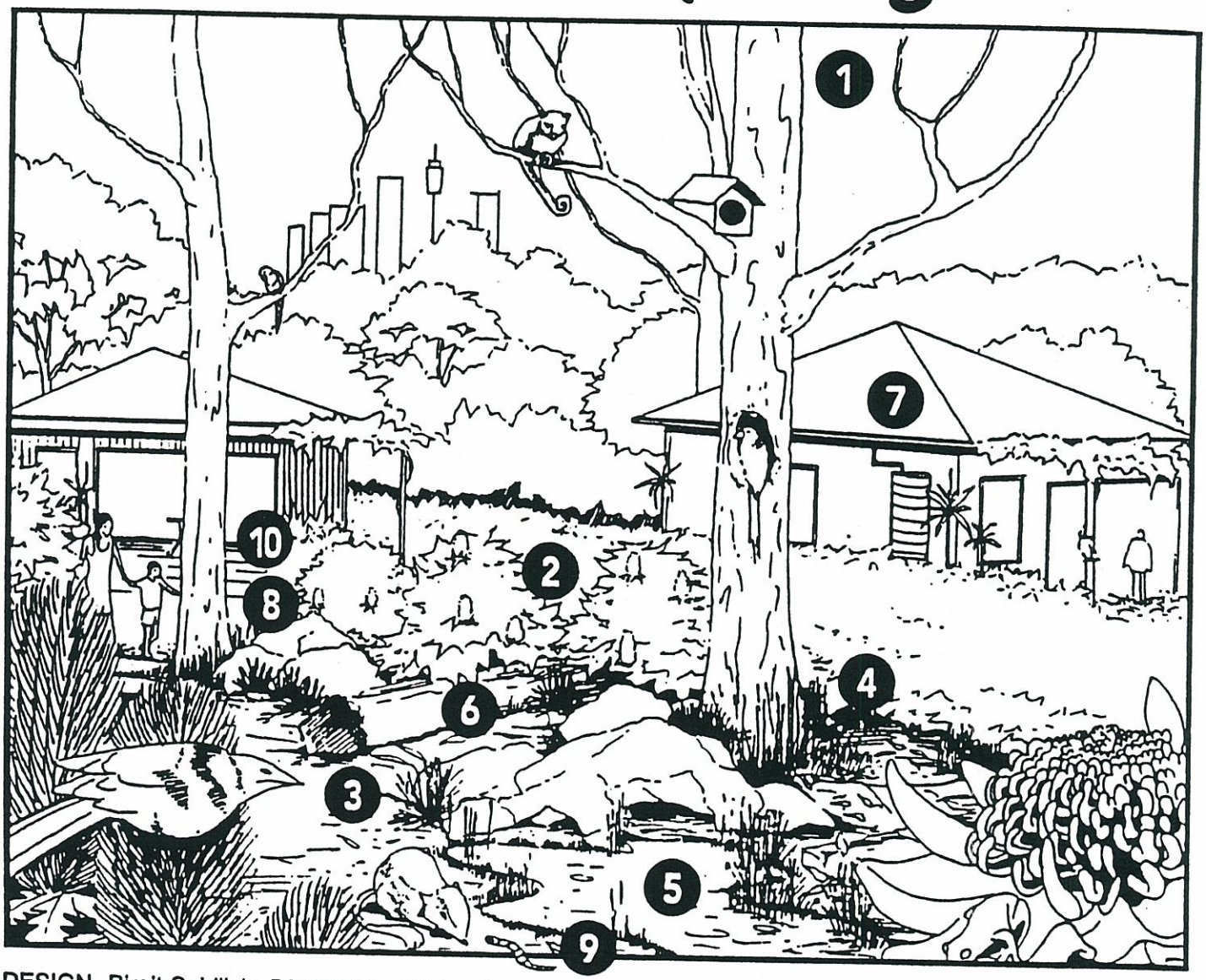
Local councils could replace concrete pipes and drains with natural waterways. Wetlands could be constructed with small lakes, water plants and habitat for native birds and aquatic animals. Well-designed wetlands lower flood peaks and reduce pollution.

Friends of the Earth is now preparing plans and seeking funding to construct a series of wetlands alongside Whites Creek Annandale. These wetlands will act as a blueprint for inner city councils.

TEXT Ted Floyd ART Felicia Henderson DESIGN Stevie Bee Design
Friends of the Earth, PO Box A474 Sydney South 1235

The urban water cycle in your garden

1. Tall trees intercept heavy rain which then slowly drips to earth
2. Dense bushy plants protect soil from raindrop impact. Deep rooted plants encourage water to penetrate the soil
3. Grasses bind soil together and reduce erosion
4. Leaf litter protects soil surface and adds organic matter to soil
5. Garden ponds store water, and so reduce flood levels
6. Mulches, green manures and compost improve permeability
7. Rainwater tanks reduce flooding and conserve water
8. Timber decking allows water to drip down to the soil
9. Earthworms, burrowing insects and micro-organisms improve permeability. Pesticides are harmful to soil organisms
10. Less paving allows more water to absorb into soils



DESIGN Birgit Seidlich DRAWN by Ed Jardine OCULUS Environmental Planning

APPENDIX B
PRELIMINARY COST ESTIMATES

WHITES CREEK CHANNEL ENHANCEMENT - from outlet of box culvert to Piper St

Preliminary cost estimate for construction **OPTION No. 1**

Item	Description	Quantity	Unit	Rate	Amount
1.00	**Earthworks**				
1.01	Remove and dispose of major trees (approximate number only)	30	item	200	6000
1.02	Clear general area of works (including allowance for disposal)	5000	m^2	0.5	2500
1.03	Remove existing fence along channel	360	m	4.5	1620
1.04	Excavate to remove topsoil to average depth of 150mm and stockpile on site	4000	m^2	1.2	4800
1.05	Supply and install temporary sediment control measures (silt fence)	400	m	15	6000
1.06	Supply and install silt curtain at downstream end of works	1	item	500	500
1.07	Excavation to reduce levels in unconsolidated fill material	6000	m^3	20	120000
1.08	Dispose of excavated material (off site)	6000	m^3	40	240000
1.09	Remove existing reinforced concrete channel and dispose of material (off site)	180	m	600	108000
1.10	Trim and consolidate channel batters	5000	m^2	2.15	10750
1.11	Replace topsoil on channel banks (150mm thick)	5000	m^2	2	10000
	Sub Total				**510170**
2.00	**Services Adjustment**				
2.01	Adjustment to existing stormwater pipes (allowance only)	15	item	1000	15000
	Sub Total				**15000**
3.00	**Rock Protection**				
3.01	Supply and place rock protection at inlet and outlet transitions (D_{50} = 1.25m)	700	m^3	200	140000
3.02	Supply and install rock bars at 25m intervals (D_{50} = 0.3m)	30	m^3	75	2250
3.03	Supply and install rock walls in low flow channel (D_{50} = 0.3m)	170	m^3	100	17000
3.04	Supply and install filter fabric under rock protection	700	m^2	2.5	1750
	Sub Total				**161000**
4.00	**Landscaping**				
4.01	Supply and install Tensar Matting (or equivalent) on channel banks	4000	m^2	5.5	22000
4.02	Supply and plant trees/shrubs adjacent to channel	100	item	30	3000
4.03	Supply and plant macrophytes in base of channel	1000	item	2	2000
4.04	Supply and install biodegradable matting on disturbed areas adjacent to channel	700	m^2	1.5	1050
	Sub Total				**28050**
	Total				**714220**
5.00	**Contingency**	10	%		71422
6.00	**Survey, Investigation and Design**	5	%		35711
	TOTAL				**821353**

WHITES CREEK CHANNEL ENHANCEMENT - from outlet of box culvert to Piper St

Preliminary cost estimate for construction **OPTION No. 2**

Item	Description	Quantity	Unit	Rate	Amount
1.00	**Earthworks**				
1.01	Remove and dispose of major trees (approximate number only)	50	item	200	10000
1.02	Clear general area of works (including allowance for disposal)	7000	m^2	0.5	3500
1.03	Remove existing fence along channel	360	m	4.5	1620
1.04	Excavate to remove topsoil to average depth of 150mm and stockpile on site	6000	m^2	1.2	7200
1.05	Supply and install temporary sediment control measures (silt fence)	450	m	15	6750
1.06	Supply and install silt curtain at downstream end of works	1	item	500	500
1.07	Excavation to reduce levels in unconsolidated fill material	12000	m^3	20	240000
1.08	Dispose of excavated material (off site)	12000	m^3	40	480000
1.09	Remove sides of existing reinforced concrete channel and dispose (off site)	180	m	350	63000
1.10	Trim and consolidate channel batters	6000	m^2	2.15	12900
1.11	Replace topsoil on channel banks (150mm thick)	6000	m^2	2	12000
	Sub Total				**837470**
2.00	**Services Adjustment**				
2.01	Adjustment to existing stormwater pipes (allowance only)	15	item	1000	15000
	Sub Total				**15000**
3.00	**Rock Protection**				
3.01	Supply and place rock protection at inlet and outlet transitions (D_{50} = 1.25m)	700	m^3	200	140000
3.02	Supply and install rock bars at 25m intervals (D_{50} = 0.3m)	30	m^3	75	2250
3.03	Supply and install filter fabric under rock protection	400	m^2	2.5	1000
	Sub Total				**143250**
4.00	**Landscaping**				
4.01	Supply and install Tensar Matting (or equivalent) on channel banks	6000	m^2	5.5	33000
4.02	Supply and plant trees/shrubs adjacent to channel	100	item	30	3000
4.03	Supply and plant macrophytes in adjacent wetland areas	2000	item	2	4000
4.04	Supply and install biodegradable matting on disturbed areas adjacent to channel	700	m^2	1.5	1050
	Sub Total				**41050**
	Total				**1036770**
5.00	**Contingency**	10	%		103677
6.00	**Survey, Investigation and Design**	5	%		51839
	TOTAL				**1192286**

WHITES CREEK CHANNEL ENHANCEMENT - from outlet of box culvert to Piper St

Preliminary cost estimate for construction **OPTION No. 3**

Item	Description		Quantity	Unit	Rate	Amount
1.00	**General**					
1.01	Remove existing fence along channel		360	m	4.5	1620
1.02	Supply and install support beams at 5m centres		180	m	400	72000
1.03	Supply and install galvanised grid decking over existing channel		900	m^2	150	135000
		Sub Total				**208620**
		Total				**208620**
2.00	**Contingency**		10	%		20862
3.00	**Survey, Investigation and Design**		5	%		10431
		TOTAL				**239913**

WHITES CREEK CHANNEL ENHANCEMENT - from outlet of box culvert to Piper St

Preliminary cost estimate for construction **OPTION No. 4**

Item	Description	Quantity	Unit	Rate	Amount
1.00	**Earthworks**				
1.01	Remove and dispose of major trees (approximate number only)	40	item	200	8000
1.02	Clear general area of works (including allowance for disposal)	3500	m^2	0.5	1750
1.03	Remove existing fence along channel	360	m	4.5	1620
1.04	Excavate to remove topsoil to average depth of 150mm and stockpile on site	3500	m^2	1.2	4200
1.05	Supply and install temporary sediment control measures (silt fence)	400	m	15	6000
1.06	Supply and install silt curtain at downstream end of works	1	item	500	500
1.07	Excavation to reduce levels in unconsolidated fill material	2000	m^3	20	40000
1.08	Dispose of excavated material (off site)	2000	m^3	40	80000
1.09	Trim and consolidate batters	3500	m^2	2.15	7525
1.10	Replace topsoil on banks (150mm thick)	3500	m^2	2	7000
	Sub Total				**156595**
2.00	**Services Adjustment**				
2.01	Adjustment to existing stormwater pipes (allowance only)	15	item	1000	15000
	Sub Total				**15000**
3.00	**Landscaping**				
3.01	Supply and plant trees/shrubs adjacent to channel	100	item	30	3000
3.02	Supply and plant macrophytes in adjacent wetland areas	1000	item	2	2000
3.03	Supply and install biodegradable matting on disturbed areas adjacent to channel	700	m^2	1.5	1050
	Sub Total				**6050**
	Total				**177645**
4.00	**Contingency**	10	%		17765
5.00	**Survey, Investigation and Design**	5	%		8882
	TOTAL				**204292**

WHITES CREEK CHANNEL ENHANCEMENT - from outlet of box culvert to Piper St

Preliminary cost estimate for construction **OPTION No. 5**

Item	Description	Quantity	Unit	Rate	Amount
1.00	**Earthworks**				
1.01	Remove and dispose of major trees (approximate number only)	5	item	200	1000
1.02	Clear general area of works (including allowance for disposal)	2400	m^2	0.5	1200
1.03	Excavate to remove topsoil to average depth of 150mm and stockpile on site	2400	m^2	1.2	2880
1.04	Supply and install temporary sediment control measures (silt fence)	250	m	15	3750
1.05	Supply and install silt curtain at downstream end of works	1	item	500	500
1.06	Excavation to reduce levels in unconsolidated fill material	4000	m^3	20	80000
1.07	Dispose of excavated material (off site)	4000	m^3	40	160000
1.08	Trim and consolidate batters	2000	m^2	2.15	4300
1.09	Replace topsoil on banks (150mm thick)	2000	m^2	2	4000
1.10	Install inlet and outlet pipes (250mm PVC)	10	m	300	3000
1.11	Construct sediment trap (allowance only)	1	item	5000	5000
	Sub Total				**265630**
2.00	**Services Adjustment**				
2.01	Adjustment to existing stormwater pipes (allowance only)	5	item	1000	5000
	Sub Total				**5000**
3.00	**Rock Protection**				
3.01	Supply and place rock protection on low flow section (D_{50}=0.3m)	50	m^3	100	5000
3.02	Supply and install rock bars at 25m intervals (D_{50}=0.3m)	20	m^3	75	1500
3.03	Supply and install filter fabric under rock protection	150	m^2	2.5	375
	Sub Total				**6875**
4.00	**Landscaping**				
4.01	Supply and plant trees/shrubs adjacent to channel	100	item	30	3000
4.02	Supply and plant macrophytes in adjacent wetland areas	1000	item	2	2000
4.03	Supply and install biodegradable matting on disturbed areas adjacent to channel	700	m^2	1.5	1050
	Sub Total				**6050**
	Total				**283555**
5.00	**Contingency**	10	%		28356
6.00	**Survey, Investigation and Design**	5	%		14178
	TOTAL				**326088**

APPENDIX 7.3 TURPIN CRAWFORD ARTISTS

WHITES CREEK VALLEY PARK
ART STRATEGY

'word works'

VISUAL POETRY

1. General

This art strategy seeks to creatively elaborate on the relationship rather than the schism between the cultures of 'nature and 'urbanism' so as to explore, critique and celebrate the eclectic nature of our urban ecologies.

It is an approach that acknowledges a dichotomy between what is perceived as 'natural' and what is perceived as 'cultural'.

It is responsive to the interplay of the context of the site and the haptic rhythms of the people who use it.

Art has the power to change the way we see the world, by raising our awareness, focussing our thoughts:

It's about heightening the sensitivity of perception
It's a game of awakening us to something we'd become merely used to
It's about making something familiar look odd
It's about seeing things in a new way
It's about delighting or questioning
It's about transformation and this can happen in the simplest, subtlest ways.

2. The Concept

2.1 Description

Develop artwork- poems with local school and other community members that play with words to connect people, place and nature.

The poems - words / emblems / symbols - are to be inscribed into stone or concrete in various playful sculptural ways throughout the park .eg tree markers, pathways, the edges of the canal itself, the perimeter edge of the basket ball court.

As visual poetics the 'word works' will become poetry for the eye and the ear.

Developed by local individuals in workshops run by a professional word/artist these simple text/ artworks -whether poems, words or just symbols will become an intriguing, challenging, entertaining, informative experience within the park providing meaning, context and above all an opportunity for personal involvement of community members in a creative act that will link them to their park in a direct and active way.

The 'word works' project invites a cross section of the community ranging from youth culture to older groups. Everyone has their own language and this difference will be expressed in the variety of 'word works' produced. For some this would become a form of legitimised graffiti, an opportunity to make a 'mark in the park' in an artful and coordinated way.

The poetic words or symbols carved in stone or cast in concrete are reminders/ suggestions/ thought provoking moments in a visitor's journey through the park. Rather than being monumental they are experiential offering a poetic experience of discovery whilst being in the park. One could chance upon a 'thought' for example whilst playing basket ball or sitting in the BBQ area or wandering through the 'labyrinth.'

At large in the park and liberated from the page the poetry of 'word works' will take on a physical and sculptural dimension.

2.2 Issues /themes addressed by *'word works'*

words / poems / emblems / symbols address the following themes:

The nature/culture dyad- the 'wild' and the 'tame'

Flora and Fauna identification

Rejuvenation of natural history - flora /fauna

The fact that new indigenous plants will not be the same as original indigenous plants because of dramatic changes in environmental conditions since white settlement - eg the fact there are more nutrients in the soil and the absence of the fire cycle

Reinforce the park's value as a habitat corridor

Cultural history of the area

2.3 The *'word works'* can be incorporated in a variety of ways

Three ways that *'word works'* could appear in the park are:

Totally integrated into the fabric of the park - eg words or symbols can be incorporated- carved or sand blasted into:

- stone seating to be created for the BBQ area
- the perimeter concrete of basket ball court
- the edge of the concrete canal

Discrete small sculptural elements within a planted bed or grassed area or around a tree or in a tree.(eg. Poetic inventions could be generated by playing with the Latin names of the plants in combination with the names of the artist/poet/maker.)

Laid in the ground as units within the paving of the pathway / cycleway.

2.4 Materials

Sandstone is a very appropriate material, being the local naturally occurring stone.

Donations could be sought from Gosford Quarries—off cuts or quarry rejects could well be considered for such a project. Council's own recycled pile of sandstone should also be considered if it is still available.

A professional stone carver artist such as Marlie Kentish Barnes or an artisan such as Jasper Swan should be approached / engaged to carve the works or to run workshops training students/ community members in the art of carving letters/emblems.

Cast concrete is another option. Moulds could be produced at school or community workshops and cast by a professional concrete casters.

3. Advantages of this art strategy

Addresses vandalism by enticing the potential vandals to be involved - giving them a forum for expression. (Stone or concrete can be treated with modern not visible anti- graffiti coating)

Can be linked to an **event** such as a tree planting day to give the process maximum visibility in the community

Involves the local schools - science departments and creative writing units

Involves older community groups

Is well coordinated and controlled by the project artist whose job it would be to inspire and give overall shape and form to the individual compositions.

Can happen in stages if this is desirable from an organisational or funding point of view - each element is reasonably distinct from others eg. project such as the basket ball court could happen at a different time from the pathway or the tree markers or the seating. Alternatively it could happen all at once

Is an affordable concept. Construction costs could be kept at a minimum by using recycled sandstone or obtaining donations or quarry waste blocks. If concrete is used the cost could be kept down by making the moulds for words/ symbols at schools.

4. Pre-requisites for success of art project

Choice of project artist is critical - an artist who works with words, has experience with outdoor public art projects and has worked with community groups is imperative. Richard Tipping is proposed by the current art consultant.

Choice of stone mason/carver is important especially if they are to work with the community. Artist / stone mason Marlie Kentish Barnes is proposed.

Support and coordination from council cultural planning unit is very important in facilitating community liaison particularly with local schools and other community groups.

Coordination of art project / project artist with project design team.

Adequate budget.

Jennifer Turpin
15th May 1998

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