



CITYLABS 4.0
MANCHESTER

L025-LYR-90-EX.00-T-L-000003

2023-07-12

LANDSCAPE MANAGEMENT & MAINTENANCE PLAN

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SECTION A – Landscape Management Plan

1.0 Introduction

1.1 General

Layer.studio on behalf of the applicant, have prepared this report in relation to the landscaping works relating to CityLabs 4.0, Manchester.

The landscape management and maintenance proposals contained within this report cover all proposed landscape works as identified within the following drawings:

- 90-EX.00-D-L-001001[GENERAL ARRANGEMENT]
- 94-EX.00-D-L-002001[HARDWORKS | B&W]
- 90-EX.00-D-L-002002[EDGINGS]
- 99-EX.00-D-L-003001[SOFTWORKS]
- 99-EX.00-D-L-003002[SOFTWORKS | DETAILED PLANTING PLAN]
- 91-EX.00-D-L-004001[LEVELS & DRAINAGE STRATEGY]
- 96-EX.00-D-L-007001[EXTERNAL LIGHTING STRATEGY]
- 90-EX.00-D-L-008001[FURNITURE]

The above drawings provide further details of the landscape proposals for the proposed scheme.

1.2 Overall Aims

The aim of the landscape management and maintenance plan is to ensure that all landscape elements are installed correctly and establish and mature successfully.

The proposals aim to successfully mitigate against any negative impact of the development, resulting in positive additions to the visual amenity.

1.3 Overall Objectives

To prescribe all necessary management and maintenance principles and tasks to enable successful establishment, and ensure the continued maturing of the planted elements.

To maximise the nature conservation value of all planting.

To ensure that the management and maintenance regime is appropriate to the site.

To provide a mechanism for the on-going monitoring and reviewing of the management plan and the specific maintenance operations contained therein.

2.0 Vegetation Types and Design Objectives

2.1 General

A number of separate vegetation types are proposed for the site. These are:

- Ornamental perennials, shrubs and grasses planting
- Hedging
- Pleached tree planting

The above will require varying management in order to successfully achieve the design objectives.

2.2 Design Objectives

The overall objective is to successfully integrate the development into the site by providing a series of planted mix areas that increase the sites bio-diversity and enhance its overall visual appearance.

2.3 Enhancing Biodiversity at City Labs 4.0

The planting scheme has been carefully chosen and designed in order to enhance the sites biodiversity.

- A range of different typologies have been created which will attract a number of birds, insects and pollinators to a site that currently lacks green space. Over half of the species chosen across the scheme are native as well as number being included on the registered RHS plants for pollinators list.
- Using a range of typologies allows for different heights, sizes and species of plants which in turn creates a number of micro habitats suited to certain insects and bugs at different times of the year. Evergreen species as well as perennials will create year round interest for wildlife. Verticality in the trees will attract species such as bird, whereas low lying grasses and perennials will be more suite to insects, mice, frogs and other bugs.
- City Labs 4.0 planting schedule lists the species of plants by mix as well as indicating the species that are native.

2.4 City Labs 4.0 – Planting Schedule

LYR184 CITY LABS 4.0

Client: **Bruntwood**

Project: **City Labs 4.0**

Location: **Manchester**

Drawing ref: **184-LYR-XX-ZZ-SCH-L-0002 Planting Schedule**

Revision: **03**

Notes: **General densities shown - plant quantities subject to detailed planting plans**

Date: **04/06/23**

Created by: **Layer.studio**



Clear Stem Trees

Abbrev.	Botanical Name	Common Name	Girth/ Dia. cm	Height cm	Root Zone	Specification	Density m2	Quantity	Native / Non Native
C be	Carpinus betulus	Common Hornbeam	18-20	350-425	RB	4x; Pleached 150-200cm wide; 4-5 tiers; EHS; clear stem min. 175cm; neatly clipped	/	As shown	Native

Ornamental Grasses / Shrubs / Perennials Mix 1

Abbrev.	Botanical Name	Common Name	Girth/ Dia. cm	Height cm	Root Zone	Specification	Density m2	Quantity	Native / Non Native
B o	Betonica officinalis	Betony	/	/	3L	Full pot; Sept to April planting	5	38	Native
H r	Hebe rakaiensis	Rakai Hebe	20-30D	/	3L	Bushy; 5 brks	4	31	Non Native
H 'Cc'	Heuchera 'Can Can'	Coral Flower 'Can Can'	/	/	3L	Full pot	3	24	Non Native
H 'F'	Hosta 'Fire Island'	Plantain Lily 'Fire Island'	/	/	3L	Full pot	5	35	Non Native
Lp	Lonicera periclymenum	Common Honeysuckle	/	60-80	3L	Caned; several shoots; 3 brks	1	4	Native
L sy	Luzula sylvatica	Great Wood-rush	/	/	3L	Full pot	5	99	Native
S off	Salvia officinalis	Common Sage	/	/	3L	Full pot	5	35	Non Native
S o	Saxifraga oppositifolia	Purple Saxifrage	/	/	0.5L	Plug; established root 2-3 months	12	97	Native
S ten	Stipa tenuissima	Mexican Feather Grass	/	/	3L	Full pot	4	143	Non Native

Ornamental Grasses / Shrubs / Perennials Mix 2

Abbrev.	Botanical Name	Common Name	Girth/ Dia. cm	Height cm	Root Zone	Specification	Density m2	Quantity	Native / Non Native
A m 'C Q'	Achillea millefolium 'Cerise Queen'	Milfoil 'Cerise Queen'	/	/	3L	Full pot	5	44	Native
C ov	Carex ovalis	Oval Sedge	/	/	3L	Full pot; Sept to April planting; British native-origin	4	28	Native
H of	Hyssopus officinalis	Hyssop	/	/	3L	Full pot	4	28	Non Native
La	Lavandula angustifolia	True Lavender	/	20-30	3L	Bushy; 5 brks	4	28	Non Native
L sy	Luzula sylvatica	Great Wood-rush	/	/	3L	Full pot	5	68	Native
M syl	Malva sylvestris	Common Mallow	/	/	3L	Full pot; Sept to April planting	5	44	Native
P al 'F'	Pennisetum alopecuroides 'Hameln'	Fountain Grass 'Hameln'	/	/	3L	Full pot	5	44	Non Native
S ten	Stipa tenuissima	Mexican Feather Grass	/	/	3L	Full pot	4	164	Non Native

Ornamental Grasses / Shrubs / Perennials Mix 3

Abbrev.	Botanical Name	Common Name	Girth/ Dia. cm	Height cm	Root Zone	Specification	Density m2	Quantity	Native / Non Native
Lm	Liriope muscari	Big Blue Lilyturf	/	/	3L	Full pot	5	31	Non Native
L niv	Luzula nivea	Snowy Wood-rush	/	/	3L	Full pot	5	31	Native
L sy	Luzula sylvatica	Great Wood-rush	/	/	3L	Full pot	5	31	Native

Hedge Planting

Abbrev.	Botanical Name	Common Name	Girth/ Dia. cm	Height cm	Root Zone	Specification	Density m2	Quantity	Quantity
C mon	Crataegus monogyna	Common Hawthorn	/	140-160	Trough	Ready/hedge instant hedging; 35cm wide x 100cm long; pre-formed with continuous root-strip; dense, straight-sided; feathered to base; neatly clipped	/	7200lm	Native

Bulbs

Abbrev.	Botanical Name	Common Name	Girth/ Dia. cm	Height cm	Root Zone	Specification	Density m2	Quantity	Quantity
H n-s	Hyacinthoides non-scripta	English Bluebell	/	/		Grade 7/8	10	As note	Native
N p	Narcissus pseudonarcissus	Daffodil	/	/		Grade 7/8	10	As note	Native

3.0 Management Principles

3.1 Ornamental Shrubs, Perennials & Grasses Planting

The landscape management principles for proposed ornamental planting are as follows:

- To ensure satisfactory establishment and continuing health
- To maintain plants in a healthy and attractive condition
- To ensure the successful establishment and continuity of the overall design concept
- To establish a diverse and varied environment
- To establish a mechanism for the replacement of any failing plant or one which has reached maturity

3.2 Hedging

The landscape management principles for hedging is as follows:

- To ensure satisfactory establishment and continuing health
- To maintain the hedge in a healthy and attractive condition
- To ensure the successful establishment and continuity of the overall design concept
- To ensure the individual plants succeed to grow a hedge that is full

3.3 Proposed Pleached Trees:

The landscape management principles for proposed individual and structure tree planting are as follows:

- To ensure satisfactory establishment and continuing health
- To maintain the plants in a healthy condition and develop the sites tree structure
- To ensure the successful establishment and continuity of the overall design concept
- To maximise conservation and wildlife value.

3.4 Hardworks:

The proposed new surface material will predominantly consist of granite paving, macadam and strips of loose gravel.

The management principles for hardworks areas are as follows:

- Procedures for regular inspections of all hard surfaced areas
- Procedures for non-attributable damage reinstatement
- Specification and sources of materials for repair/reinstatement (Refer to relevant drawings for details)
- Procedures for cleaning

3.5 Ecological Enhancements:

The proposed new scheme will see the installation of two new bird boxes attached to the pleached trees to the rear of the building.

The management principles for the bird boxes are as follows:

- To ensure the box provides a safe and clean environment for nesting birds

SECTION B: Landscape Maintenance Plan

4.0 The Use of Chemicals

Chemicals generally should not be used, unless specifically instructed to do so. No chemicals are to be used when the dwellings are occupied. All chemicals, herbicides, pesticides and fertilisers, should be approved by Natural England and should be used, stored and disposed of in accordance with NE guidelines and COSHH Regulations 1988 / 2002.

4.1 Maintenance Operations

Set out in the tables below, are the maintenance operations that should be carried out in order to achieve the design objectives. They have been set out in a format that can be easily followed by all parties, ensuring that the Management Plan exists as a working document and not an archived report. The management prescriptions are flexible such that each section can be changed and updated on an annual basis, allowing targets to be set, progress monitored and accurate reporting:

SOFTWARES

Group No	Prescription	Year (s)	Season	Frequency (per year)
1	<u>Ornamental Shrubs, Perennials & Grasses Planting</u>			
	a) Maintenance during defects liability period or 5 years after planting whichever is the greater.			
	Operations to include:			
	i) Maintain all areas in a weed free condition through hand weeding operations. Herbicide applications on instruction only.	1 – 5	As required	10
	ii) Application of granular fertiliser (15:15:15).	1 – 5	Spring	1
	iii) Water as necessary to ensure establishment and continuing health	1 – 5	Summer Autumn–Spring	Weekly As required (min 10 visits)
	iv) Ensure plants remain firmly bedded after disturbance and re-firm as necessary	1 – 5	As required	As required
	Control all pests and diseases as necessary	1 – 5	As required	As required
	Replace any dead or dying plants implemented in year 1.	1 – 5	Autumn	1
	Prune early flowering shrubs after flowering	1 – 5	Early summer	1
	Prune late flowering shrubs before new growth	1 – 5	Early spring	1
	Prune evergreen shrubs	1 – 5	Mid spring	1
	Prune herbaceous perennials as required to maintain form and supply supports as needed	1 – 5	Early summer	1
	b) Post 5 years maintain as above.	6 – 15	As required	As required
	c) Replace any dead/ under performing plants. Where planting continually fails to establish, undertake investigations to ascertain any underlying cause.	6 – 15	Autumn	As required
	d) Control all pests and diseases as necessary	6–15	As required	As required

Group No	Prescription	Year (s)	Season	Frequency (per year)
2	<u>Hedge Planting</u> a) Maintenance during defects liability period or 5 years after planting whichever is the greater. Operations to include:	1 – 5	As required	10

i)	Maintain all areas in a weed free condition through hand weeding operations. Herbicide applications on instruction only.	1 – 5	Spring	1
ii)	Application of granular fertiliser (15:15:15).	1 – 5	Summer Autumn-Spring	Weekly As required (min 10 visits)
iii)	Water as necessary to ensure establishment and continuing health	1 – 5	As required	As required
iv)	Ensure plants remain firmly bedded after disturbance and re-firm as necessary	1 – 5	As required	As required
	Control all pests and diseases as necessary	1 – 5	Autumn	1
	Replace any dead or dying plants implemented in year 1.	1-5	Early Sumer	1
	Prune hedging as required to maintain form and supply supports as needed	6 – 15	As required	As required
b)	Post 5 years maintain as above.	6 – 15	Autumn	As required
c)	Replace any dead /underperforming plants. Where planting continually fails to establish, undertake investigations to ascertain any underlying cause.	6-15	As required	As required
d)	Control all pests and diseases as necessary			

Group No	Prescription	Year (s)	Season	Frequency (per year)
3	<u>Pleached Tree Planting</u>			
	a) Maintenance during defects liability period or 5 years after planting whichever is the greater. Operations to include:			
	Maintain a 1m weed free ring around the base of each newly planted tree by hand weeding operations.	1 – 5	As required	As required
	Application of granular fertiliser (15:15:15).	1 – 5	Spring	1
	Water as necessary to ensure establishment and continuing health	1 – 5	Summer Autumn-Spring	Weekly As required (min 10 visits)
	Ensure trees remain firmly bedded after disturbance and re-firm as necessary	1 – 5	As required	As required
	Remove all dead, dying, damaged and crossed wood	1 – 5	Spring/Autumn	2
	Control all pests and diseases as necessary	1 – 5	As required	As required
	Replace any dead or dying trees planted in year 1.	1 – 5	Autumn	1
	Clip trees to maintain the height and formal appearance	1-5	Spring/Autumn	As required

	b) Replace any dead/ under performing trees planted. Where planting continually fails to establish, undertake investigations to ascertain any underlying cause.	6 - 15	Autumn	1
	c) Carry out an annual inspection of all trees and carry out remedial work as necessary	6-15	Autumn	1

HARDWORKS

Group No	Prescription	Year (s)	Season	Frequency (per year)
4	<u>Granite Setts</u> a) Maintenance during defects liability period or 5 years after planting whichever is greater. Operations to include: - Paving / pathways to be swept removing any leaves & detritus - Regularly inspect all hard-surfaced areas. - If small amounts of weeds become established, treat with weed killer annually. - Undertake remedial works as necessary as described below. - Power wash surface (instructions as per section 4.2) to clean and remove any dirt from surface..	1 – 5	As required	As required
		1 – 5	As required	As required
		1 – 5	As required	As required
		1 – 5	As required	As required
		1 – 5	As required	As required

Group No	Prescription	Year (s)	Season	Frequency (per year)
5	<u>Macadam</u> a) Maintenance during defects liability period or 5 years after completion, whichever is the greater. Operations to include: - Paths to be swept removing any leaves & detritus - Regularly inspect all hard surfaced areas - Undertake remedial works as necessary as described below	1 – 5	As required	As required
		1 – 5	As required	As required
		1 – 5	As required	As required

Group No	Prescription	Year (s)	Season	Frequency (per year)
6	<u>Loose Gravel</u> a) Maintenance during defects liability period or 5 years after completion, whichever is greater. Operations to include: - Raking and removal of loose leaves and general leaf litter - Rake gravel to a min 50mm depth	1 – 5	As required	As required
		1 – 5	As required	As required

Group No	Prescription	Year (s)	Season	Frequency (per year)
7	<u>Litter Picks</u> a) Maintenance during defects liability period or 5 years after planting whichever is greater. Operations to include: - Regularly remove litter from all areas of the site every two weeks	1 – 5	All	26

ECOLOGICAL ENHANCEMENTS

Group No	Prescription	Year (s)	Season	Frequency (per year)
8	<u>Bird Box</u> a) Maintenance during defects liability period or 5 years after planting whichever is greater. Operations to include: - Remove bird box from trees every Autumn – ideally September – and clean out the box so it is empty as well as any debris on the roof. Place nest back on tree.	1-5	Autumn	1

4.2 Hardworks Maintenance

Hard surfacing needs to be maintained to ensure it is in a good condition providing safe routes for all.

It is important that hard surfaces are regularly inspected so that defects can be identified and rectified. Typically, early life maintenance, or aftercare of new works will be the responsibility of the Contractor. Contractors should visit the site at regular intervals to inspect all paved areas regularly during the maintenance period, and to undertake any remedial works. At the end of the maintenance period, the contractor will be required to undertake remedial works to the satisfaction of the Client. Effort is required to ensure surfaces are maintained as they were originally constructed. Details below describe how paved areas should be maintained.

Following Contractor hand-over at Practical Completion the Management Company will undertake all required management and maintenance activities.

- Common defects

Paved areas deteriorate in a variety of ways, depending upon the type of construction and cause of distress. When deterioration presents a safety hazard then maintenance becomes essential. Timely maintenance, in some instances, can prevent deterioration progressing to a state where reconstruction is required.

- Broken or damaged elements

Apart from being unsightly, cracking and spalling can become a hazard if it creates a trip. Spalling occurs during transport and laying, but can less commonly be a fault in the material. It can result during manufacture, impact loading, abrasion and weathering. Inappropriate size or depth of element results in fracture under loading.

- Treatment options

Maintenance treatment will depend on the type of defect and what has caused the deterioration. For some surfacing, topping up of material may be all that is required, but poor surface profile may require a site investigation to provide information on the condition surface. Suitable strategies can then be formulated based upon informed engineering judgement.

- Lifting and relaying

Relaying elements of flexible construction should be carried out in the same way as new construction. Additional guidance for flags is given in BS 6677. Removing a damaged single element prior to relaying can be difficult, particularly if it is small element, as breaking it out may disturb adjacent modules. It may be necessary to consider relaying all elements, which about the damaged area, or to relay a full line of elements back to an edge restraint. If the surface has poor profile, elements will need to be lifted over the whole of the affected area.

In all cases a complete renewal of the bedding material should always take place. An experienced paver is required to execute a good reinstatement.

CLEANING GENERALLY: (the following notes are for guidance only)

1. Chemical cleaning of concrete surfaces to remove stains including: Graffiti/ grease/ fats/ nicotine/ inks/ dyes/ waxes & carbon to be done with a proprietary cleaning product. 'Mastersolve' by Graffiti Magic Ltd to be used for removal of stains and graffiti. For final removal of graffiti shadows left behind from graffiti removal cleaners a recommended product would be 'Shadow Lifter' by Graffiti Magic Ltd. Alternative products are available but will require client approval. All cleaning work using proprietary products to be carried out to manufacturers recommendations.

2. Street Furniture

Stainless Steel/Galvanised or Powder Coated finishes; Balustrades, handrails etc.

- The steel planters should be washed down with proprietary cleaner and washed down with clean water.
- This should be done annually to retain the finish and prevent the build up of corrosive salts. Remember that most surface corrosion on stainless steel is due to contamination from site operations.

SPECIFIC CLEANING TASKS:

- **Power Washing**

The Use of Power Washing Equipment on hard surfaces.

To aid in the removal of surface staining power washing equipment is often considered.

Whilst such techniques offer certain benefits, particularly for larger areas, it is important that care is taken in their use to avoid damage to the structural integrity of the paving.

When using any form of Power Washer the following guidelines should be strictly adhered to:

- The power washer should be used on a setting, which is sufficient to remove the dirt without causing any further distress. A low-pressure setting is recommended.
- Do not direct the power lance directly down onto the paving, as this can result in loss of jointing material.
- Ideally a spraying movement should be adopted holding the power lance at a shallow angle, not greater than 30° across the diagonal (i.e. not parallel to joints)
- Certain high-pressure jetting machines have been known to mark / damage the surface of certain types of paving material. It is therefore prudent to carry out a small

test area before commencing on a larger area. The area should be inspected after cleaning to ensure that joints are full.

- **Dirt and Detritus**

To remove general dirt and detritus regular brushing is recommended. If detritus reduces the intensity of the colour of the material, then this can be re-established by scrubbing with a mild detergent e.g. washing up liquid, and hot water. Ensure all the detergent has been thoroughly washed from the surface on completion of the cleaning and the resulting run-off is carefully channelled to either drainage points or containers where it can be safely disposed of.

- **Moss, lichens and algae**

Moss, lichen and algae can be prevalent on hard surfacing where the area is heavily shaded, under trees or is not laid to an adequate fall. If such growths do occur and are considered undesirable then the area should be treated with a proprietary weed or moss killer used in accordance with the manufacturers' instructions. Such products take some days to be effective and are most effective when applied during a spell of dry weather. The washes work best if any thick growths are scraped off first and the wash is well brushed in. Some treatments leave a residue to discourage the re-growth of the moss and algae but this will only be of limited value if the surrounding conditions leave the paving damp and in shade.

- **Weeds & Plant growth**

All plant growth found within any hardworks is to be treated with an appropriate herbicide (in accordance with item 4.1.). All arisings are to be removed from site and disposed of accordingly in the correct manner. Where herbicides are used, they must be approved by the Environment Agency for safe use near water courses.

- **Rust Stains**

Initially action must be taken to eliminate the sources of staining.

To remove the rust stain, the surface should first be wetted with clean water and then the affected area treated with a 7 to 10% dilution of Hydrochloric acid solution.

*Guidance on the safe use of chemical treatments is given below (Acid Washing) of this document.

- **Oil Stains**

Oil can penetrate readily into hard surfacing materials, but it should not stain if any spillages are removed promptly with an absorbent material e.g. paper towels, cloth or absorbing granules. Do not attempt to wipe the stain as this will drive the oil into the surface and spread it over a wider area.

If the stain persists then an emulsifying degreaser should be employed. Brush the cleaner onto the affected area, leave for a period of time according to the manufacturer's instructions and then wash the emulsified oil away with plenty of clean water.

Alternatively, the surface can be scrubbed with a detergent and hot water taking care to ensure that the strength of the detergent is not detrimental to the appearance of the paving. However, for persistent oil staining, steam cleaning may have to be considered.

- **Bitumen Stains**

Fresh bitumen should be allowed to cool down before removing it with a paint scraper or similar. If it is particularly resistant, the use of ice to make the bitumen brittle may be required prior to scraping it from the paving. Any residue should be removed with an abrasive powder and finally the whole area rinsed with clean water. Certain proprietary cleaning agents are available to remove bitumen but these should be tested on an inconspicuous area of paving first.

- **Graffiti & Paint Stains**

Both paint and graffiti are difficult to remove from most hard surfacing materials. Fresh wet paint should be soaked up with an absorbent material without wiping the paint, as this will spread the stain. It should then be treated with a suitable solvent such as white spirit and then the area washed with a de-greasing agent taking care in the disposal of the run-off material.

Dried paint should be scraped off as far as possible and then an appropriate paint remover applied. Paint manufacturers may often be able to give more detailed advice on the removal of paint and graffiti. Therefore, they should be consulted directly for specific recommendations.

- **Epoxy & Polyester Stains**

Areas of solidified epoxy or polyester resin can be removed by carefully burning off the area with a blowtorch. Care must be taken not to inhale any fumes given off. If, after burning, a black stain remains, this can be removed by scrubbing with detergent and hot water. For larger areas grit blasting may have to be considered, however the effect of such treatment on the micro texture of the surface should be carefully considered. Again, it is advised that a small area be tested before any large-scale operations are undertaken.

- **Smoke, Fire and Tobacco Stains**

Normally such stains can be removed by scrubbing with detergent and hot water. Where the stains persist, a mixture of scouring powder and household bleach can be used. It is important the bleach is washed from the area with clean water once cleaning is completed and the run-off carefully disposed of.

- **Beverage Stains**

These can normally be removed by scrubbing the stain with detergent and hot water. If the stain is persistent, apply a household bleach solution and then rinse the area with clean water taking care to dispose of the run-off safely.

- **Chewing Gum**

Chewing gum is a particularly difficult substance to remove from hard surfaces. Newly discarded gum can be scraped off by using a mechanical scraper but hardened gum can only be removed by both freezing the gum and chiselling it from the surface of the

paving or utilising a hot water/steam cleaner. For specific advice on chewing gum removal, it is recommended that specialist contract cleaning companies be contacted directly for further details.

- **Scuff Marks from Vehicle Tyres**

These can normally be removed by steam cleaning, or by scrubbing the area with detergent and hot water.

- **Cement and Lime staining**

Both types of staining can occur on paved surfaces, usually as a result of contamination from other sources, such as concrete street furniture or the use of onsite mortars and concrete. Cement and lime deposits are generally insoluble and therefore require treatment by a suitable acid cleaner to fully remove them.

- **Acid Washing**

Stubborn and persistent stains that will not generally weather away naturally will require the application of a specific acid cleaning treatment to remove them.

Prior to any acid cleaner being applied, the surface must be thoroughly wetted with clean water to prevent the acid being absorbed directly into the paving. A dilution of 7 to 10% of hydrochloric acid should then be prepared and applied to the affected area.

As the staining begins to dissolve, some frothing may be apparent, which should be followed by agitation of the surface using a stiff bristle brush to completely remove all trace of the stain.

Once this process is complete the whole surface should be rinsed thoroughly with clean water, taking care to dispose of the run off safely. In the vast majority of cases, one treatment will be sufficient; however, in some cases re-treatment may be required. When using any form of chemical treatment, the following guidelines should be strictly adhered to:

- With deeper stains, the degree of acid treatment may result in an acid etched appearance.
- Protective clothing (gloves, boots, goggles etc.) should be worn at all times when using chemicals and the appropriate first aid measures must be available on-site.
- Take care to ensure that surrounding materials and landscaping are protected. Soft landscaping and exposed metals can be severely affected by chemical treatments.
- It is better to treat several times with the correct dilution than to use concentrated acid, which may damage the surface of the unit.
- When diluting acids, always add acid to water and not water to acid.