SCOTS

Society of Chief Officers of Transportation in Scotland
Natural Stone Materials Working Group

Report

on

Cleansing Practice
in Natural Stone Streetscape Areas
in Scotland

by

ID Consultants

JUNE 2003

FOREWORD

Society of Chief Officers of Transportation in Scotland
Natural Stone Materials Working Group

Cleansing Practice in Natural Stone Streetscape Areas in Scotland

Following the publication of the SCOTS; Natural Stone Surfacing-Good Practice Guide in October 2000, SCOTS commissioned ID Consultants to prepare the above research report and the following related reports.

- Technical Evaluation of using Natural Stone Surfacing in Streetscape Schemes in Scotland
- Whole Life Costing for Natural Stone Streetscape Works.

The three ID Consultants reports are written to complement each other and should be read in conjunction with the Good Practice Guide.

The Good Practice Guide can be found on the SCOTS website(www.scots-website.org.uk) and our reports will in due course be placed on this site.

The views and recommendations forwarded in all three reports are entirely those of ID Consultants and are based upon questionnaires, site visits and discussions with designers and maintenance staff on 24 selected streetscape sites in Scotland constructed over the last decade.

We are extremely grateful for their co-operation, hospitality and willingness to share experiences, both good and bad, that made it possible to produce these reports.

The reports recommendations represent what we believe should be adopted as Best Practice but that does not mean that in the future further improvements will not be made and we hope that the website can be a forum to express such views.

If anyone wishes to discuss any aspect of these reports we shall of course be pleased to do so.

Hans Halstvedt
ID CONSULTANTS
11A Lynedoch Street
Glasgow G3 6EF
Tel: 0141 353 0878
Fax:0141 332 5221
Email: idconsultants@compuserve.com

Contents

Executive Summary

1.0 Background **5**

2.0 Relevant National Legislation **6**

3.0 Typical Street Cleaning Practice **8**

3.1 Manual Sweeping
3.2 Mechanical Sweeping
3.3 Power Washing
3.4 Litter and Waste
3.5 General Stain Removal
3.6 Chewing Gum
3.7 Flyposting
3.8 Dog Fouling
3.9 Graffiti Removal and Prevention
3.10 Weeds
3.11 Paving Sealants
3.12 Cigarette Disposal

4.0 Typical Street Cleaning Management **23**

4.1 Procedures and Manuals

4.2 Costs and Best Value

5.0 Actual Street Cleaning Practice - results of surveys and key findings **26**

5.1 Existing Practice and Management

5.2 Street Cleansing

5.3 Waste

5.4 Stain Removal

6.0 Good Practice Recommendations **32**

7.0 Conclusions **39**

Acknowledgements

Executive Summary

In July 2002, SCOTS appointed iD Consultants to study, in detail, a wide range of completed public realm streetscape schemes that have used natural stone paving materials. Each scheme was assessed through the completion of a detailed questionnaire by the local cleansing manager, site visits and in some cases interviews with key staff.

During the last decade, some £15M per annum has been invested in natural stone streetscapes in Scotland. This is tailing off now mainly due to the reduction in European funding, and it is the aftercare of the completed improvements that is now critical. It is vital that all public agencies work together to ensure that the investments made retain their character and quality for a long period. One of the key factors in this aftercare is street cleansing, which includes not only the direct effects of litter, waste and staining, but also the indirect effects on public perception of an area and hence its economic viability.

From a detailed literature search, general generic advice for street cleansing operations has been developed. Following this, a detailed examination of street cleansing management and practice in the schemes studied has been carried out to reveal the various elements of good (and less effective practice).

These findings were discussed in detail with Keep Scotland Beautiful (KSB) [a.k.a. ENCAMS(Scotland)] who have provided detailed information from their considerable experience to give a national perspective on the research.

This report brings together the ‘theory’ and the actual practice. It concludes with general and specific recommendations in the form of best practice guidelines for the full range of street cleansing operations, which it is hoped will provide a catalyst for Roads and Cleansing staff to improve the execution of their services, either individually or in partnership.

1.0 Background

Street cleansing generally refers to the removal of surface deposits and litter (including waste) using a range of equipment and techniques.

To shopkeepers, customer perception that High Streets are dirtier than roads around out-of-town shopping centres makes for an uncertain future. There is a commonly held view that a clean town or city will be a successful one, being a pleasure for people to visit and shop, and attractive to prospective businesses.

In Scotland about £55M is spent annually on the direct costs of street cleaning and litter clearance. It can cost between £6 and £19 per kilometre to sweep streets.

These figures exclude indirect costs, for example the relationship between public / tourist attraction and cleanliness. The economic benefits of being renowned as a clean location are immense, conversely the cost of being seen as a dirty location are equally high.

In a survey for ENCAMS (then the Tidy Britain Group) in 1998, it was found that vandalism and dog fouling are the two local environmental issues, which cause most concern to people. Littered streets were placed only third in the survey.

A more recent survey found that although there is considerable public concern about flyposting, graffiti and fly tipping, such activities were not as widespread as is often perceived. Perhaps this is due to targeted action by Councils over the past few years.

The methods used by Councils to wash their streets and use of herbicides to kill weeds is often criticised as damaging to the environment.

2.0 Relevant National Legislation

Under Section 89 of the Environmental Protection Act 1990, local authorities have a legal duty (as far as practicable) to clear litter and refuse from public places for which it is responsible, such as streets, parks, pedestrianised areas etc. If a piece of private land is littered, the owner is responsible for its clearance. Often the problem is determining who owns a particular piece of land and therefore who is responsible.

Littering is a crime if it happens on public space. Action can be taken through the courts or alternatively through local litter wardens appointed by the local authority. The Offence of Leaving Litter (section 87 of the Environmental Protection Act 1990) says that if a person drops, throws, deposits or leaves anything so as to cause defacement in a public place, they could be committing a littering offence.

There are a number of opportunities through national legislation to control activities, which lead to littering and damage to the street surface, for example :

- Litter offences penalised by fixed penalty schemes are becoming increasingly popular.
- Litter Control Areas can be designated by local authorities under section 90 of the Environmental Protection Act 1990 (EPA).
- Litter Abatement Notices can be used under section 92 of the EPA.
- Street Litter Control Notices can be used under sections 93 and 94 of the EPA

It must be recognised that any such legislation requires practical enforcement with one of the main issues being that of ‘credibility’. For example in the case of littering, are there ough opportunities to put litter elsewhere to justify a claim that someone has littered unnecessarily?

ENCAMS have recorded that fewer than 1000 people per year in Britain are being fined for littering, yet Councils receive around 80,000 complaints over the same period. It has been found that litterers often evade fines by refusing to give their names and addresses to Council Officers.

Prosecutions for dog fouling average only 2 per authority per year, under the Civic Government Scotland Act Section 48. This Act is currently under review and a Bill is

passing through the Scottish Parliament, for introduction in late 2003. It is expected that this will provide improved powers for local authorities to deal with this problem.
The most successful prosecutions are likely to be of property owners who the council can ‘trace and chase’ rather than the people on the street.

In its latest offensive against untidiness on Britain's streets, the Government is considering ending the uncertain status of chewing gum, by classifying it as litter under the EPA1990. They are also considering changing the litter code to include cleanup standards for gum. However, it is recognised that prescribing such cleanup standards would inevitably lead to time consuming and `expensive burdens on every authority.

3.0 Typical Street Cleansing Practice

3.1 Manual Sweeping

Until the 1990s, street sweeping was carried out by hand using brushes and carts. Such operations were completely dependant on the ability and commitment of the operative and were a vital part of the local street environment. They were often regarded as the ‘face’ of the local authority on the street.

Manual sweeping can reach every part of the street surface irrespective of the layout and design of street furniture and avoids the build-up of detritus in those ‘hard-to-reach’ places.

However, manual sweeping is labour intensive and can be slow. Operatives are working in the open all day, regularly bending down, both of which are hazardous to the health and welfare of staff.

Time and motion-type surveys in the 1980s resulted in frequency-based cleansing operations rather than needs-based, and during the 1990s manual sweeping gradually disappeared from most of our town and city streets.

3.2 Mechanical Sweeping

Most commonly in major urban areas, street cleaning is carried out by sweeping machines, often generically referred to as ‘green machines’. These are suction sweepers used throughout the world for cleaning outdoor shopping malls, pedestrian streets, pavements and other high-litter pedestrian areas.

Typical street sweeping machines

Originally a walk-behind machine, newer versions allow the operator to ride, but all modern versions are compact and quiet enough to operate safely and efficiently in areas of high pedestrian traffic.

For most of these machines, contra-rotating brushes in front of the sweeper catch litter and direct it into a central suction nozzle where it is sucked up through an impeller fan, which pulverises it before depositing into a regular disposable trash sack. Even glass can be safely pulverised into a sand-like substance thus eliminating safety concerns.

Some modern machines have special attachments for more specific cleaning purposes, for example dog fouling and discarded fast foods. Chewing gum removal is currently not achievable using sweeping machines. There are a number of specialist machines on the market which can remove chewing gum and these will be considered in some detail later.

One manufacturer claims that a single machine can do the work of 6 of the best manual litter pickers, and that machines can clear more of the areas where hand picking is limited, and can carry far more. This was the original justification for a rapid introduction of sweeping machines in the 1980s

However, it is now widely considered that there is really no substitute for skilled and experienced manual operatives with brushes to achieve the quality required in our principal public spaces. Whilst speed of surface cleansing is important from a financial perspective, in principal public realm areas quality and effectiveness of cleansing operation is at least equally as important.

To address the gradual move from “needs” based service provision, to “frequency” based, a balance of mechanical and manual methods will be required, to be truly effective in meeting the standards of service expected by today’s public.

3.3 Power washing

There are a number of definitions for power washing :

- Power (or pressure) washing is a general term used for any type of cleaning using water under what is considered moderate pressures (generally 1000 to 3000psi).
- High pressure or ultra high pressure cleaning uses specialised equipment capable of generating between 4000 and 40,000psi.

- Steam cleaning, as the term suggests, uses water heated to between 212 and 350 degrees at very low volumes, and low pressures.

Ultra high pressure cleaning can be used to remove coatings from many surfaces. Steam cleaning has traditionally been used to degrease surfaces and a variety of indoor applications (given the low water volume). Power/pressure washing applications are limitless, and can clean all kinds of paved surfaces, graffiti, stains etc.

Over recent years, power washers have become more affordable, with a range of equipment available, from small-scale domestic machines available from most DIY stores, to industrial scale machines. Used correctly and safely they are ideal tools for keeping paving in good condition.
Most major power washers are capable of dealing with the majority of paving cleaning requirements. However, such washing will not necessarily remove all stains. For example, oil needs to be removed with special cleaning compounds, and cementitious material has to be removed by mechanical or chemical action, whilst rust can prove impossible to remove.

Power washing will not undo the effects of ultra violet colour fading of certain materials (mainly concrete products) but it can make what colour remains more attractive, by removing dirt, detritus and surface vegetation. It is particularly effective at removing mosses and algae, and offers a cost-effective alternative to the use of specialist sealants, which are designed to inhibit the growth of what is really a relatively minor problem. It is also argued by many that the presence of such growth is actually desirable in sand-filled joints to provide stability.

There is widespread concern about the effects of power washing on the jointing of paved areas. Experience has demonstrated that loose sand jointing tends to get washed out of jointing unless great care is taken. Specialist advice suggests that keeping the water lance at a shallow angle (< 30 degrees) may help to reduce or even prevent the loss of jointing materials. Cement stabilised jointing will tend to withstand all but the most powerful washing.

3.4 Litter and Waste

Litter can mean a small item (e.g. a crisp packet) or large item (e.g. a black bin sac) or items scattered around. Litter has been defined as “waste in the wrong place caused by human agency”. In other words people make litter. Discarded food is also litter. The most frequent litter is cigarette ends, sweet wrappers and matchsticks. In national surveys, dog

fouling, drink cans and fast food packaging were identified as the litter most people disliked seeing.

It is clear that the issue of littering is not taken seriously enough by most people and that they are often entirely oblivious to the consequences of dropping litter and the damage being caused to the local environment. Singapore is often mentioned as a good example of litter control. However, they have solved their litter problem through extremely stringent enforcement and large penalties, which are unlikely to be found acceptable in the UK.

Litter can be measured by considering a number of general groupings :

- smoking related litter
- fast food packaging
- newspapers
- commercial litter
- hazardous litter

Under Section 89 of the Environmental Protection Act 1990, local authorities have a legal duty (as far as practicable) to clear litter and refuse from public places for which it is responsible, such as streets, parks, pedestrianised areas etc.

A local authority's powers and responsibilities for collecting household and commercial waste are given in the Environmental Protection Act 1990, Part II 'Waste on Land' Sections 45-47.

Collection of Waste (Section 45)

Waste collection authorities (i.e. the local authority) shall :

- arrange for the collection of household waste in its area, at no charge.
- arrange for the collection of waste for any commercial premises in its area, if requested by the occupier of the premises - at a reasonable charge. There is competition from the private sector for this business.

Waste Duty of Care Staying Within the Law (Section 34)

This Duty of Care says that people handling waste, in whatever capacity, have legal responsibilities :

- to prevent the escape of waste;
- when transferring the waste, to make sure that it is only transferred to a person authorised to dispose of such waste; and
- to prevent any other persons committing the offences of disposing, treating or storing waste without a waste management licence, in contravention of conditions of a licence or in a manner likely to cause pollution or harm to health.

This means that each person handling waste must take all reasonable steps to keep waste safe, by bagging it, containing it without spillage or exposure to wind and rain. It must be securely stored in corrosion proof containers, must not leak, and must be safe from theft, vandals, animals or scavengers.

Businesses that dump waste onto footways (other than for official collection) can be fined for littering. So can householders. Litter laws should apply equally to individuals dropping litter and, for example, shopkeepers who put their waste out improperly. Many people are of the opinion that the litter laws do not go far enough and that further improved legislation is needed.

Monitoring

If we can discover where the litter has come from e.g. the public, construction activities, commercial operations, domestic activities etc., and we know where it was found e.g. retail areas, roads, pedestrian areas etc. we can start to develop an understanding of the problem. If local authorities were to standardise the way they carry out this examination, then comparisons could be made across the country, and perhaps make benchmarking possible.

Following an extensive survey of land use issues of 11,000 sites in England, ENCAMS are now promoting Environmental Quality Surveys, whereby local authorities can see exactly where they are succeeding and where they are not. Based on this approach, ENCAMS have developed a standard format for assessment creating benchmark criteria against which local authorities can measure their performance. The concepts are contained within self-teach modules. This approach has now been adopted by the Government and will soon to be rolled out across the country. For further information visit the ENCAMS website (www.encams.org) or the cleanliness BVPI website at www.leq-bvpi.com.

It is widely considered that the most effective way to reduce litter is the provision of additional litter bins. However, recent studies in one town in Scotland showed that the

frequency of litter bin emptying and their strategic location were more important than the simple number/volume of bins provided. When taken together with the general need to reduce clutter in the urban street environment, this is a key issue. The use of fines or increase in fines may be preferred in some places before improved public awareness, but both have a role. It is also accepted by most people that litter wardens actively working on the street would be beneficial.

3.5 General Stain Removal

Stains on street surfaces can come from a variety of sources, but predominantly from discarded drinks cans, leaking rubbish bags, poorly maintained litter bins, vehicles, and untidy surface repairs There are a whole range of typical techniques for dealing with stains and some general techniques are indicated in this section. It should be noted from the outset, that all methods of stain removal have some kind of environmental impact, and this should be recognised as a general problem specific to all practices

Cementitious stains

Mechanical action - remove as much of the cementitious material as possible by using a hammer and bolster to chisel off the offending material, taking care not to chisel into the paving.

Cement stains

Scrubbing - with a wire brush can remove most of the remaining material without causing long-term damage to the paving.

The combination of chiseling and scrubbing may be sufficient to remove the worst of the stain. Natural weathering will thereafter eliminate or disguise the remaining slight staining.

Chemical action - should only be used if the chiseling and scrubbing have left an unacceptable residual stain. Commonly used cleaners contain acids which react with the cementitious material, breaking it down and enabling complete removal by wire brush. For concrete paving materials great care must be taken to avoid damage to the paving surface. Where there is any concern, a trial should be carried out in an inconspicuous area of paving.

Replacement - it may be that the staining is so serious that the most cost-effective method of removal may be the replacement of the paving unit itself.

Beer, wine and soft drinks

In an urban area this will be a regular problem, particularly close to litter bins. Hot soapy water should normally be sufficient to remove such sugar-rich stains but certain stubborn drinks may require repeated treatments to be successful.

Oil stains

There are a number of proprietary oil-stain removers but experts suggest that no one method is completely effective to remove fully all oil stains, although some commercial agents supplied by specialist chemical companies can remove most of the staining.

The sooner an oil stain is treated, the more likely it is to be completely removed. A cloth should be used to soak up any droplets on the surface but care must be taken to avoid smearing and spreading the spill. There are proprietary absorbent materials available for soaking the oil out of the surface, although sawdust is used in some places and even some clay-based cat litter material can be effective.

Any residual materials left over from the absorbing agent can be tackled with detergents and brushes before a final cleaning with water. This may require repeated operations.

Clean oil will tend to soak into the paving and there will be little evidence after a few weeks. Dirty oil on the other hand can be difficult if not impossible to completely remove.

If the stain is proving impossible to remove then there may be no option other than to replace the affected paving.
In areas where staining is expected, appropriate surfacing materials should be selected at the design stage, for example multi/random coloured materials which will tend to camouflage stains.

Algae, lichens, Mosses etc.

Most street surfaces that are not frequently trafficked will eventually develop mosses, fungi and the like, over time, particularly in damp locations. Regular abrasive brushing with a stiff bristled broom and / or application of proprietary weedkillers a couple of times a year, should control most of such growth.

Proprietary fungal washes are widely available which must be applied during a dry weather period. Heavily affected areas are best scraped clean with a garden hoe/spade followed by stiff brushing and washing down with water.

Discolouration of sandstone

Rust stains

Rust stains arise from water running over metal fixtures and fittings then depositing iron particles on the adjacent paving. It can also be the result of oxidation of iron-rich compounds in the aggregate of the paving (concrete materials). Rust stains are probably the most difficult stain to remove from paving.

There are proprietary 'rust removers' but their effectiveness varies and they must be tested on a small inconspicuous area before applying widely.

The only other treatment method is through mechanical action. Vigorous scrubbing with a wire brush can often remove the worst of the staining as can 'sanding down' of the surface using an abrasive stone. Both of these will remove the damaged surface layer and reveal the clean surface below.

Rubber stains

In areas where light-coloured surfaces are regularly trafficked, rubber residues from tyres will be inevitable. As well as being unsightly, particularly in long dry weather spells with little rainfall, the rubber on the surface can lead to a serious reduction in the slip/skid resistance of the road surface.

Usually, medium/high pressure water will remove most of the staining if treated early enough. If residues are allowed to build up over time, then the best way to remove them might be to shot blast (with sand) or shot peen (with metal pieces) or to flame-texture the surface. These are expensive treatments and are typically used for re-texturing stone surfaces on a much longer timescale than that for general stain removal.

Paint

Dried stains can usually be scraped off the surface and the residue removed using paint stripper.

3.6 Chewing gum

Chewing gum is a major problem in most pedestrian spaces, and on streets in general. It has been estimated that the costs for cleaning gum off Britain's streets every year is in excess of £150M.

Chewing gum droppings

There are calls by some for legislation to control the discarding of chewing gum. In Singapore fines of up to $1,000 can be applied for chewing gum in a public place. This reflects that country's concern for the pollutant affect discarded gum has on street surfaces.

It is hard to spot anyone dropping gum on a busy street, which would make enforcement of any legislation very difficult. Perhaps the long-term answer lies in a tax on gum, to be used specifically for removal, or the introduction of stick-free gum? This issue is currently on the agenda of the Scottish Executive.

One town in England is trialing 'gum targets', where the public stick their gum on specially designed targets mounted around the town. The targets bear pictures to attract attention and to encourage use. They are regularly cleaned/replaced, but the service is expensive.

There are a range of proprietary gum removing / gum dissolving processes available on the market and they all claim to be completely successful. Anecdotal evidence suggests that some are better than others but more research is required to determine which is actually the most effective. The most common methods are Scraping; Pressure washing - cold, hot water or steam (sometimes with chemicals/agents); Freezing and Laser burning

When considering which system to use, it would be worth carrying out trials with a number of specialist organisations, and some simple factors, which could be used to compare performance of each method, might be :

- ✓ environmental friendliness
- ✓ gentleness on surface
- ✓ amount of noise created by the operation
- ✓ water efficiency
- ✓ ease of use amongst pedestrians
- ✓ welfare factors for operators
- ✓ speed of operation
- ✓ costs

3.7 Flyposting

This is generally considered to be the display of advertising or other publicity material on buildings and street furniture without the consent of the owner. It is a very cheap method of publicity, which explains its popularity. It can occur in any location, is unsightly and could be seen as being symptomatic of a low quality of the local environment.

There are a number of legislative approaches to the control of flyposting, primarily under sections 224 and 225 of the Town and Country Planning Act 1990 and under the Roads Scotland Act. The Department of the Environment published in November 2000, a document titled the ‘Good Practice on the Control of Fly-Posting’.

3.8 Dog Fouling

It is estimated that around 7M dogs in Britain produce 900 tonnes of excrement per day. There continues to be a high level of concern from the general public about the fouling of public spaces. Local Authorities have a key role in the fight to persuade dog owners to clean up after their pets.

The relevant legislation includes Environmental Protection Act 1990 Section 89 (1) and (2); Litter (Animal Droppings) Order 1991; Dogs (Fouling of Land) Act 1996; Department of the Environment Circular No. 18/96; and the Civic Government (Scotland) Act.

Every local authority has a legal duty to keep certain types of land, which come under its control, clear of dog faeces (so far as is practicable), irrespective of whether by-laws are in force. These areas include :

- parks, recreation/sports grounds and children's playgrounds
- tourist beaches and promenades
- pedestrianised areas
- footways, verges, footpaths
- carriageways

In 1997/8 the Tidy Britain Group carried out a major survey into this problem across the country. The survey considered amongst other things, the actions that local authorities are taking. Only 9% of authorities reported having specialist machinery for the removal of dog faeces i.e. 90% use manual equipment which is slow, costly and unpleasant to staff

3.9 Graffiti Removal and Prevention

Graffiti is widely considered as a form of vandalism. The nature of graffiti varies from what might be regarded as 'art' to young people scrawling their names. To the owners of the property, and to the community in general it is unwelcome, distressing and difficult to remove.

Graffiti

In some cases where the graffiti is offensive - obscene, racist, personal, libelous, or defamatory, this must be given highest priority and removed quickly. Equally, where graffiti has a high visual impact, it must be removed quickly irrespective of content.

The presence of graffiti has a major negative social affect and is seen as an indicator of local social decline and neglect. Often this is not actually the case but is nevertheless a common and damaging perception. It will be the responsibility of the local authority to remove graffiti from all public buildings, monuments and street infrastructure. The local authority does generally not cover private buildings, although they may assist the owners.

Prosecutions can be brought under the Criminal Damage Act 1971, and small fines (a few £100s), or in the case of young offenders, community service orders can be given.

Success in keeping graffiti under control will require a combination of removal, prevention and deterrent methods, the detail of which will be different in every location.

Removal of graffiti should be performed using the mildest process possible, using specifically designed chemicals when necessary. For durable stone or brick surfaces, a process of wet sandblasting might be used. This method offers the benefit of added cleaning power without the abrasiveness of traditional sandblasting.

There are a number of proprietary materials, which can be applied to surfaces to allow improved ease of removal. Individual advice should be taken for each location from manufacturers in the absence of definitive independent testing and research.

It must always be remembered that repetitive graffiti removal from particular problem areas will inevitably have a detrimental effect on the cleaned surface.

3.10 Weeds

In gardening circles, a weed is a plant growing in the wrong place. For local authorities it is more than just aesthetics that determine weed control. Some varieties of weeds damage infrastructure whilst others pose a risk to health.

In any paved area, particularly where sand has been used for jointing, there is an ideal growing medium, which can cause an annual and persistent problem. Weeds will naturally start to grow in any open textured sand jointing materials, typically around street furniture and in areas difficult to access with cleansing machines. They can collect litter, damage paving and block drains. This will occur in any areas, which are difficult to clean under routine conditions.

Whilst weeds in open areas will tend to be prevented from growing by normal day-to-day cleansing operations, there will always be places where some will grow and ideally these should be removed (including roots) by hand. In reality, it is unlikely that regular hand removal of weeds will be a viable financial option even though this would be the most successful long-term plan. It is more likely that non-labour intensive and swift action using

chemicals will be preferred, even though this will not always tackle the underground root growth and spread.

The regular application of proprietary weedkilling chemicals will control outbreaks, but at what cost to the environment, and over what area - blanket coverage or spot-application? There are also health and safety considerations, which must be recognised for operatives, the general public, animals etc.

If weed treatment is carried out at the right time of year (Spring and Autumn are ideal) then weeds can be brought under control with only a few stray ones needing individual attention from time to time. To maintain control, a commitment to regular treatment must be made.

3.11 Paving Sealants

There are a number of proprietary sealant systems available, developed primarily for the concrete/clay block paving market. They are intended to protect the paving from stains, inhibit weed growth and stabilise jointing materials.

Sealants are being increasingly specified for major public areas where cleanliness and appearance are important, and where the regular use of street sweeping machines can remove the jointing materials between paving units.

There are 4 main types of sealants :

- Water based emulsions
- Solvent based acrylics
- Moisture cured urethanes
- Hydrated polymer glues

The most commonly specified sealants in the UK are the acrylics and urethanes.

Acrylic sealants are relatively cheap, but require repeat treatments at yearly intervals to maintain their properties. They are not as flexible as urethane sealants and can be adversely affected by oils, petrol etc. They are perhaps best considered as ‘colour enhancers’.

The urethane sealants are much more reliable and offer longer protection, albeit at a higher cost. While some of the cheaper acrylic sealants are simply glorified varnishes, urethane

products can repel oils and paints, prevent staining and efflorescence and eliminate weeds. They also bond the jointing material to reduce loss through erosion.
Some sealants have no visible affect on the appearance of the surface of the paving, whilst others cause a permanent ‘wet-look’ with either a gloss or a matt finish.

The higher specification urethane based sealants are becoming increasingly popular for use in civil and commercial applications. Manufacturers claim that the use of these materials can prolong the working life of a pavement and reduce the whole life costs by reducing maintenance and cleaning requirements.

3.12 Cigarette Disposal

A recent ENCAMS study has shown that a high proportion of smokers regularly litter streets with their cigarette ends. These are small and difficult to remove especially when wet or when they get caught in joints in paving, gaps against walls etc.

It can take up to 5 years for cigarette ends to degrade in the open air.

In response to criticism, many smokers are unhappy about the design and location of litter bins, using this lack of alternative means of disposal as a justification for dropping them in the street.

To meet this challenge, consideration should be given to incorporating specific cigarette end bins into the street environment along with promotion of alternatives, which would enable ends to be carried around without danger or inconvenience to the smoker.

4.0 Typical Street Cleansing Management

4.1 Procedures and Manuals

Every local authority will have established guidelines for providing street cleansing services, based on local demography and the experience of local managers. Often these services will be dependant to at least some degree of funding availability, and cost effectiveness.

Efforts during the 1970s to 90s to mechanise cleansing operations in the interest of simple productivity, have unfortunately led to a general reduction in the quality of street cleansing. In terms of quality of cleaning, it is widely accepted that there is no substitute for manual operatives, a fact recognised in many other countries where manual street cleansing is the norm in urban streetscape areas. Indeed in some countries the use of mechanised equipment is not permitted in certain high quality areas.

Given the increasing awareness and expectation of the public, who can now make comparisons between outdoor shopping areas and internal shopping malls, the quality of the appearance of any street is now critical to its future performance and viability.

Public and private organisations are investing substantial amounts of money into urban streetscaping for the benefit of the whole community - to bring in shoppers, visitors, tourists etc. and to encourage local business growth. Such investment is made on the basis that the surfaces will be treated with care and will be protected from damage as far as can be reasonably achieved. When damage does occur, repair must be quick and to a high standard. Such overarching policy requires all organisations that are active in the street to work in co-operation.

The most efficient way to achieve this would be to have service and operational guidelines clearly set out from the outset and for these to be complimentary irrespective of which organisation is actually responsible for delivery.

One way to achieve this would be for a Manual to be developed for the whole streetscaped area (perhaps included within a larger framework of other quality areas) that could bring together all operational maintenance requirements into a single document. Such a Manual must have input from all parties involved and not be written by a single organisation and given to the others as a finished article. Considerable consultation and liaison will be required before a Manual can be successfully implemented.

Initially the Manual will most likely contain details of current practices, although there is the opportunity to include details of enhanced services given the quality of the area being considered. Over time, as services develop and hopefully improve, then the Manual must be updated and retained as a 'living' document.Responsibility for the ongoing management of the Manual should be established from the outset. This could be an onerous task for a single person particularly if they are already involved in providing one of the services. It is more likely to fall to a small group of operational managers to meet regularly and to discuss maintenance issues in a holistic manner, and importantly, to be cross cutting in their outlook.

4.2 Costs and Best Value

Best Value requires that services are continuously assessed, monitored and improved. The use of a Manual will provide the initial vehicle for this, with details of services recorded, gaps identified, and opportunities for improvement at least considered. Whilst it will be up to individual service providers to carry out their own performance management, pooling resources and information through a multi disciplinary management group will ensure that everyone works together in the same direction, and in ways evidently seamless to users.

National performance indicators do not identify urban centres separately from other areas, so such indicators will not be useful in managing the urban area. Local, more meaningful indicators should therefore be established and be used as the basis for continuous improvement.

It is inevitable that improvements to services will always be possible. It will come down to funding to determine how much improvement can be achieved. However, this should not be considered as a reason to hold back on changes. If an idea is good and in the wider best interest then a robust case must be made for securing additional funding.

Such requests for funding can only be assisted where a clear business reason exists. This can be demonstrated through performance management linking it to wider policies and strategies.

One factor, which should be considered in all service planning considerations, is the potentially damaging effects of continued stone cleaning on some stone types. With softer, less durable stones, for example sandstones and mudstones, the effects of repeated surface treatments on the life cycle characteristics must be considered. The physical condition of certain stones can degrade over time leading to an increased need for repair

and maintenance in the future. Stone cleaning can be viewed as the beginning of a long-term change, carrying with it a range of costs and benefits for both the short and long term.

The effects of mechanised cleansing, even over shorter terms, on surface appearance and jointing between paving units must be appreciated by all managers and considered in all decisions on how to provide services. The decision whether to use manual or mechanical methods was developed in sections 3.1 and 3.2. It is widely accepted that mechanised suction sweepers (of whatever size) will, to some degree, affect the integrity of the paving surface through removal of jointing material. Even proprietary joint stabilising compounds and concrete cannot withstand some of the suction pressures applied to them. The full extent of this is outwith the scope of this report but should be subject to further research to determine the limits of the effects of mechanised cleansing on a range of paving materials.

5.0 Actual Street Cleansing Practice - results of surveys and key findings

5.1 Existing practice and management

24 completed streetscape schemes (where natural stone paving has been used) have been assessed through detailed questionnaires, site visits and some individual interviews with local cleansing managers. In general it is evident that local authorities, having invested in the street surfaces are attempting to retain the quality appearance of their principal urban areas. The degree of commitment and success varies across the country even though most of the challenges being faced are not unique and are common to all.

Only 5 of the local authorities surveyed have detailed maintenance Manuals (which include cleansing requirements) for their quality streetscaped areas. A further authority has a Manual but it refers only to paving surface maintenance and does not include cleansing.

One authority has the management and enforcement of their Manual carried out by a management group, where managers of all of the operational service departments meet regularly to co-ordinate services and to seek improvements through service reviews including input of public opinion and professional expertise.

No authorities were able to identify the actual costs of providing cleansing services in the individual streetscaped area. It is therefore not possible to compare costs before and after a streetscape project nor to compare spending between different Councils, although in some schemes, the indication was that costs had not changed after streetscaping was completed. One assumption is that that cleansing procedures have not actually changed or improved following extensive streetscaping.

50% of respondents indicated that they have had additional funding provided specifically to improve street cleansing for the streetscaped area.

Only one Council use street wardens for the monitoring of street cleansing, waste etc.

No Council in the study has specific performance management covering the streetscaped area. All Councils use only the national performance indicators and none have specific indicators developed to isolate town or city centres.

Most Councils do not have specialised training for management or operatives who are responsible for cleaning natural stone surfaces. This should be a concern to all authorities, as even a basic understanding of the importance of retaining the quality and integrity of the paved surface should be given to all parties involved in its aftercare

5.2 Street Cleansing

Cleansing management systems

Each council in the study has some form of established management system for street cleansing. In most, the streetscaped area is included an a generic Council-wide system, without being specifically highlighted for special treatment, although some Councils do have cleansing guidelines included within a published Manual

Funding

Only a few Councils stated that they have been given additional year-on-year funding to provide a level of service above that provided elsewhere in the Council area. However, two authorities have been given specific one-off allocations to fund particular initiatives, for example the purchase of a gum removal machine.

In general all respondents stated that in their opinion, the level of funding provided is insufficient to ensure that the quality of the street is retained to any more than a satisfactory standard.

Street sweeping

There is little variety in the ways that street sweeping is carried out across the country. Manual sweeping is not being used regularly or extensively anywhere, with most authorities favouring instead a range of mechanical sweepers, manual methods being kept to a minimum. The most common reason given for this is productivity, suggesting that quality of service is of lesser importance. The frequency of sweeping varies from once a day to 3 times a day

Litter bins

Most respondents recorded that there were insufficient bins provided in their streetscaped areas. Two respondents recorded that the bins were too small.

Many places have used expensive bin styles, often specifically designed for that scheme. In one case the bins cost around £1000 each to supply and install. These have been too expensive to replace or to increase the number of, and standard plastic bins are being added to the street to make up any shortfall in capacity.

Bins are generally emptied once a day but in two areas, they are emptied 'on demand' which at times can be at least three times a day.

Complaints procedure

75% of respondents confirmed that they have a formal complaints procedure for cleansing. There was no indication given of how successful such complaints procedures are in improving services.

Customer satisfaction

Each respondent was asked for an honest opinion of what they thought the public perception of, and satisfaction with, the cleansing service was. 75% stated that they thought that the public was satisfied.

5.3 Waste

Waste management systems

90% of Councils have a managed system for waste management, as part of their business plans. In most, the streetscaped area is included in a generic Council-wide system.

Waste removal operators

In 30% of areas visited, waste is uplifted by a combination of Council and private operators, working in competition with each other. Such competition may seem attractive to those who have financial responsibility but the detrimental effects on the street are apparent sometimes with bags left out for hours / days awaiting pick up, litter left lying after waste bags removed due to speed of operation, stains caused by leaking waste bags not cleared up, vehicles driving on footway surfaces to reduce lifting distances. These detrimental effects may save money to businesses but can be costly to the Council who may have to clear up and repair damage to surfaces.

Over half of the areas visited have waste uplifts once or twice a week. The rest had at least three uplifts per week.

Location of disposal site

Just under half of the respondents indicated that waste was taken to tip less than 5 miles away. In all other cases, tips were in excess of 5 miles from the point of uplift. One Council uses a transfer station a few miles from the town centre from where waste is taken on to a licensed tip further away.

Specialist vehicles

With the exception of one Council, there were no indications of any specialist equipment used for waste collection and removal, that will minimize the impact on the streetscaped surfaces. Standard equipment is used throughout, including large HGV, which when fully laden can impose a substantial load onto paving.

Funding

Only a few Councils stated that they are given additional year-on-year funding to provide a level of service above that provided elsewhere in the Council area. Mainly this has meant that additional waste uplifts are carried out, often uplifting material left out for private operators in order to clear the street.

In general most respondents stated that in their opinion, the level of funding provided for waste removal is insufficient to ensure that the quality of the street is retained at anything more than a satisfactory standard.

Complaints procedure

Most respondents confirmed that they have a formal complaints procedure for waste services. There was no indication given about how successful these procedures are in improving services.

Customer satisfaction

Each respondent was asked for an honest opinion of what they thought the public perception of, and satisfaction with, the waste uplift service was. All stated that they thought that the public was satisfied with the level of service provided.

5.4 Stain Removal

Written procedures

Around half of Councils indicated that they have written procedures for stain removal. Many prefer to tackle the problem on an adhoc basis, allowing the sweeping machines to carry out daily washes (which are fairly superficial).

The principal stains tackled are drinks/liquids and chewing gum, which are a problem to every Council. Oil, cement and rubber tend to be occasional and in many places they are not treated being left to wear off over time.

In most areas manual methods are employed where possible using hot and cold pressure washing which can deal with most stains, apart from chewing gum. Stains are sometimes removed as part of specific one-off campaigns and little planned action is taken to tackle the problem in a regular manner.

Chewing gum removal

Only one Council has purchased specialist gum removal equipment and has trained a specialist cleansing squad in its use. This is used for about one week per month and is often used to clean stains from paving and street furniture. One other Council has specialist equipment on long term lease from the manufacturer and use it at least 10 days a month.

Some Councils hire specialist firms from time to time to tackle specific problem areas, whilst other Councils do not deal with the problem at all.

Customer satisfaction

Each respondent was asked for an honest opinion of what they thought the public perception of, and satisfaction with, the stain removal was. All stated that they were unable

to meet the needs and expectations of the community but thought that the public was generally satisfied.

Funding

All respondents agreed that in their opinion, the level of funding provided for stain removal is insufficient to provide a satisfactory level of service.

6.0 Good Practice Recommendations

6.1 Management Systems

Every completed streetscape scheme should be included in a formal cleansing management system, ideally identified in its own right and having specialist procedures appropriate to the high level of attention required. All procedures should be written down and appropriate staff awareness achieved. Where necessary training should be given to operatives and managers.

Best Value requires that there should be performance measurement and this should be included in the management system, with indicators developed for use in present and future comparator studies.

Where possible, cleansing procedures should be incorporated into a comprehensive Maintenance Manual for the area, which would cover all Council services. This should contain full details of service provision and include performance measurement and improvement targets

The problems associated by waste uplift operations could be reduced by public and private operators meeting together and agreeing basic strategies and timings, along with improved enforcement action against businesses that put waste out for long periods.

A customer survey carried out in one town concluded that the general public does not understand that various organisations could be uplifting waste, and hold the council responsible for the service. For this reason, it is in the interest of the council to be proactive by working with private operators.

6.2 Street wardens

There is evidence from user feedback around the country that the public would like the council to have “eyes and ears” on the ground all the time, able to react to damage, littering, waste being left out, graffiti, deficiencies in services etc.

Some places have street wardens but they are used more for tourism duties rather than for monitoring activities on the street. Only one Council had wardens specifically responsible for monitoring cleansing activities. To be successful wardens should be crosscutting in

their outlook and not be focused solely on one set of operations whilst others are going on all around.

6.3 Training

There is a need for training of both manual staff and managers, covering the importance of stone surfacing (well beyond it being “just a road surface”) Such training need not be formal, and there will be someone in every local authority (most likely in the Roads or Planning side) who could impart the overall importance of streetscaping to the community. They could explain the main challenges in retaining the appearance and durability of the stone surfaces, and most importantly, to highlight the vital part every member of cleansing (and whole Council) staff has in achieving the wider improvement objectives.

6.4 Communication

Planning and environmental officers may already talk to each other, but all relevant departments should get involved to consider the overall environmental impact of what they are doing? A broad collaborative, holistic and cross cutting approach is essential.

Methods of communication are changing all the time, but the underlying importance of good communication cannot be underestimated. With the wide range of communication options available, creating meaningful dialogue and relationships between all stakeholders in an area should not be difficult, and one certain result would be substantial improvements to the local environment.

The increase in Call Centre provision within local authorities is creating an ideal mechanism for interfacing with the public and for monitoring performance against reported deficiencies in service.

6.5 Best Value

A culture of audit/survey review and improvement is vital if Councils are to get street cleansing fully under control to a standard acceptable to everyone. The community has a role in this and should be engaged through consultation and feedback, as well as through direct action against those who litter, cause stains and graffiti etc.

6.6 Funding

It is clear from this study that an underlying hindrance to the provision of an 'ideal' cleansing service is funding. This is not new and should be a starting point for creative and innovative use of resources, rather than a reason for doing nothing. For example, equipment trials and use of community resources offer just two opportunities for making best use of limited funds to tackle certain problems.

Ideally quality public realm areas should be recognised for their importance, and be provided with additional funding to provide appropriately high quality services using appropriate resources.

The important role of street wardens providing a point of contact and 'eyes and ears' on the ground all of the time, should not be underestimated, and should be an aspiration within every management strategy. Various training programmes and initiatives can be used to procure or part fund such services - all potential sources of funds and personnel should be considered.

6.7 Specialist Equipment

There are few examples of specialist cleansing equipment in use around the country. It is evident that specialist companies are marketing their equipment, and the response in terms of trials and use of the equipment varies from Council to Council. Some co-ordination and sharing of information between Councils would be beneficial.

There is a need for development of affordable and effective equipment that can tackle the various problems faced in every urban area. At the moment few manufacturer's can claim that their equipment fulfills both of these aims.

6.8 Good Practice Guidelines

Litter

For high quality public spaces, performance targets should be set well above those used for other areas, to reflect the considerable value of good street appearance and the ever increasing public expectations. Many people use out of town malls for the simple fact that the walking surfaces are swept and cleaned regularly thus creating an attractive atmosphere in which to shop.

There is a need to concentrate resources to achieve a standard well above the legal minimum or the standard applied to other nearby areas. This could be achieved using some of the following recommendations:

- ✓ Provide enough litter bins, preferably covered ones, located in most convenient places. They should be available for use at all times and the frequency of emptying will be critical in preventing overflow.

- ✓ Ensure bins provide sufficient storage volume and are emptied on a regular basis. For most major public areas these should have an individual capacity of at least 100 litres, and the actual location of bins will depend on the geometry of the street, lines of travel (especially away from take away shops) and servicing frequency. The need for emptying may vary throughout the day, but with experience an optimum cycle of servicing should be achieved.

- ✓ Establish a system for secure storage of retail waste (inside or outside premises) and time this appropriately to the schedule of uplift, by both public and private operators.

- ✓ Consider cyclical service provision rather than ad hoc treatments.

- ✓ Establish written guidelines and performance targets for litter issues, and keep these under review.

- ✓ Take precautions to prevent spillage from refuse bags, and protect bags from wind when placed outside. This is an issue really for the person putting the bags out on the street, targeted direct personal contact and education in problem areas might assist in prevention.

- ✓ Take-away shops should have bins located outside them, although too many bins close together will prevent cleaning of the paving surface between them.

- ✓ Have well-trained cleansing staff who are committed to providing a good service.

- ✓ Encourage a litter conscious attitude by all users of the street through public education programmes and campaigns.

- ✓ Identify ‘hot spots’ and target action appropriately.

- ✓ If possible appoint litter wardens who can work closely with Police on enforcement.

- ✓ Ensure that all service providers and the local community appreciate the importance of maintaining the quality appearance of the street.

Street Cleaning - Stains

- ✓ Establish written guidelines for all stain types.

- ✓ Use appropriate equipment based on trials of alternative types

- ✓ Recognise the possible detrimental effects of operations on the quality of the stone surface and its joints.

- ✓ Consider cyclical treatment instead of / as well as, ad hoc programmes of work.

- ✓ Recognise the need to give staining some degree of priority to ensure action is taken.

- ✓ Treat with appropriate equipment and materials as quickly as possible. Have appropriately trained staff and specialist equipment.

- ✓ Identify source of staining and try to prevent recurrence.

- ✓ In new surfacing, try to incorporate polished surfaces against walls and around street furniture to allow more successful cleaning

Chewing gum

- ✓ Determine the most appropriate system for your needs both technically and financially through trials, or on peer group recommendation.

- ✓ Regularly treat 'hot spots' around entrances and bus stops for instance.

- ✓ Establish a treatment programme, which will cover the whole street surface. Gum dropping is indiscriminate and affects the entire street, even though certain areas are affected worse than others. Regularly target ‘hot spots’.

- ✓ Encourage a gum conscious attitude by all users of the street through public education programmes.

- ✓ Secure the required additional funding to adequately tackle the problem.

Fly posting

Fly posting will occur almost anywhere and whether the property is publicly or privately owned, the detrimental affects on a public space can be considerable. Local authorities should work with building owners to seek partnerships to jointly tackle the problem.

Local Authorities have a number of approaches to try to tackle the problem on their property (which could equally apply to private owners) :

- ✓ Prosecution of offenders (if enforcement resources are available)

- ✓ Removal under legislative authority

- ✓ Prevention through surface treatment of furniture etc. (generally of limited use)

- ✓ Use of dedicated or approved sites for placing of advertisements.

Prevention through education and campaigns.

Dog Fouling

Whilst the most cost-effective solution to much of the problem would be to encourage dog owners to take responsibility for fouling and to clean up after their pet, some other actions a local authority can implement include :

- ✓ employ dog wardens

- ✓ have a complaints procedure

- ✓ carry out educational and promotional work within the community

- ✓ enforce legislation

- ✓ provide adequate quantity and locations of dog-waste bins

Graffiti

This is very much a social problem and involves only a small number of people, even though the effects of their actions are considerable. It is essential that local authorities and private owners are pro-active and that :

- ✓ There is a system in place to identify graffiti through regular inspections, and to take reports from external parties who have discovered some graffiti.

- ✓ There is a mechanism for getting an appropriate experienced contractor on site as quickly as possible, and that they have the correct equipment and materials for the work. Experience shows that prompt removal is a very good deterrent to further problems.

- ✓ There is sufficient funding put in place to pay for inspections, removal and prevention.

- ✓ Consideration is given to the use of protective coatings for areas regularly damaged. Unfortunately, the more experienced graffiti artist will be able to use a range of painting media to ensure maximum difficulty in removal.

- ✓ There is an education programme through local schools to prevent graffiti.

- ✓ There is direct Police action towards known regular offenders (e.g. through exclusion).

7.0 Conclusions

The competition between town and city centres with out of town malls is increasing and levels of cleansing and facilities are fundamental in the public's decision making on where to shop.

There is a need for an integrated approach to all aspects of street cleansing which should employ cultural along with mechanical and chemical controls.

Whilst chewing gum may be the biggest problem at the moment, all cleansing issues must be treated equally to avoid investment for single issues reducing the impact of others. Single-issue campaigns tend to be generally short term and quickly forgotten unless regularly revived.

Local authorities and communities each have a part to play and must work together. Prevention will always be better than the cure, and there is a need for strong partnership working both between Council departments and with the all other local public agencies, for example the Police, along with the whole community. Success will only be achieved with everyone working together, treating the symptoms as well as tackling the cause of the problems through education and enforcement if necessary, followed by well-organised and effective action on the ground.

Each authority must develop specific cleansing strategies, which are appropriate for the effective and safe care of their high quality assets. These should be part of a Maintenance and Management Manual for the area.

Adequate funding, ideally ring fenced, must be provided to allow services to be developed based on community need. Investment in specialist equipment and the training of staff is vital, and will certainly be beneficial in the long term.

Specialist training of operatives and staff involved in the care of natural stone surfacings is needed, only a few local authorities carry out their own in-house staff training. A national approach to this is required, with recognised qualifications being used to ensure that only qualified staff is permitted to operate in high quality areas. Only in this way will the services provided be of the highest possible quality.

Manufacturers of specialist equipment must work together with local authorities to develop a range of machines that are practical, cost effective and affordable, and most importantly which do not damage the surface being cleaned. Through a further research programme,

these issues should be developed to produce definitive procedures and guidelines for cleaning of stone streetscape areas.

Acknowledgements

ID Consultants wish to acknowledge the valuable assistance given by the SCOTS Natural Stone Materials Group and ENCAMS (Scotland) in the preparation of this report. They particularly wish to recognise the contribution towards the research for, and preparation of, this report by Angus Bodie.

In addition, the following sources of information are acknowledged :

Renfrewshire Council's Maintenance and Management Manual
Surveyor Magazine 6/13 June 2002 "Rubbishing Theories"
Surveyor Magazine 10 October 2002 "A Clean Bill of Health"
Surveyor Magazine 7 November 2002 "Councils Boosted by Fine Proposal"
Various Tidy Britain Group / ENCAMS publications
Historic Scotland TAN 18 "Treatment of Graffiti on Historic Surfaces"
AJ McCormack and Son "Paving Expert - Maintenance and Repair - Removing Stains"
AJ McCormack and Son "Paving Expert - Paving Sealants".