

LFC STADIUM EXPANSION

[Job reference PL1312-ID-05] [Work stage - Planning]

MATERIAL MAINTENANCE GUIDE FEBRUARY 2016

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GRANITE



IN-SITU CAST CONCRETE



[Masterplan for illustrative purposes only]

Tarmac to Highways

[Not included in this document as is with adopted areas and subject to LCC Management and Maintenance regimes]



CONCRETE ASPHALT

PCC Flags

[Not included in this document as only located to adopted footpaths and therefore subject to LCC management and maintenance regimes]



MACADAM



LFC Anfield Stadium Expansion

RESIN BOUND GRAVEL

CONCRETE BLOCK PAVING



Slate + Cashel

SUPPLIER:

Acheson-Glover T: 028 8778 8139 E: specifications@acheson-glover.com

DESCRIPTION:

"BOULEVARD" Concrete Paving Block

DIMENSIONS:

200x150x80mm (cashel) / 150x150x80mm (slate)

LOCATION:

.FC Anfield Stadium Expansion

Edge of plaza, The Grove, Stanley Park Linkage



Maintenance & Cleaning

Regular maintenance and good cleaning practice will enhance the overall appearance of the paving, these guidelines detailed below are quite comprehensive but not exhaustive.

Health and Safety Note: Some of the cleaning methods described involve the use of chemicals which must be used correctly and strictly in accordance with the suppliers/manufacturers' recommendation. The following precautions should also be noted:

• Appropriate protective clothing such as gloves, goggles, ear defenders, boots and overalls should be worn.

• Adequate ventilation is required in confined spaces when using chemicals.

- When using flammable materials, cigarettes, naked
- flames and other sources of ignition should be avoided.
- When diluting acid based cleaners, ALWAYS add acid to water and not water to cleaner.
- Any clothing which is contaminated with chemicals should be disposed of safely.
- Care must be taken not to damage, contaminate or stain any adjoining material.
- Personnel operating in the area of the cleaning must be protected from any hazard created by the cleaning. (Risk Assessments and COSHH)

It is particularly important with all cleaning methods that trials should be carried out on a small, preferably inconspicuous area, to determine the effect of the treatment before commencing work on a larger area.

Cleaning of paving: General dirt and detritus:

To remove general dirt and detritus, regular brushing is recommended. If the colour of the paving becomes masked it may be re-established by scrubbing with soap and warm water, either by hand or by using an industrial cleaner. Ensure all the soap has been thoroughly washed from the surface on completion of the cleaning and carefully channeled in the resulting run-off to either drainage points or containers where it can be safely disposed of.

Moss, lichens and algae: Moss, lichens and algae should not grow on concrete unless the area is heavily shaded, is

under trees or is not adequately drained. If such growth does occur and is considered undesirable then the area should be treated with a proprietary cleaner suitable for the purpose, used in accordance with the manufacturer's instructions. Some treatments leave a residue to discourage the regrowth of the moss and algae, but this will only be of limited value if the surrounding conditions leave the paving damp and in shade.

Rust stains: Action must be taken to eliminate the sources of staining. To remove the rust stain, the surface should be wetted and the affected area treated with an acid based concrete cleaner (no stronger than an equivalent 5% Hydrochloric acid solution or similar). Acid based cleaners dissolve a thin layer of the concrete surface and should be used sparingly. These cleaners may leave a slightly roughened surface (which may increase the slip resistance) or leach out some of the pigment from the concrete (dyed concrete products only), so care must be taken when using acid based cleaners. After application of the cleaner any residue should be washed off the surface of the concrete with copious quantities of water to avoid staining. Care should be taken to dispose of the run-off safely. All manufacturer's instructions must be strictly followed and after cleaning is completed, any chemical residue should be disposed of carefully.

Oil stains: Oil penetrates readily into concrete, but it should not stain if any spillage is removed promptly with an absorbent material e.g. paper towels or cloth. Do not wipe as this will drive the oil into the concrete and spread the contamination over a larger area. If the stain persists, a cleaner suitable for the purpose should be used in accordance with the manufacturers' instructions. Alternatively the surface can be scrubbed with a strong detergent and the residue washed away with hot water. However, care must be taken as this method might also result in the leaching out of some pigment from the concrete product and discolouration due to surface abrasion of the concrete.

Bitumen stains: Bitumen does not penetrate concrete readily. The bitumen should be left until it has cooled. It can then be removed using a paint scraper or similar mechanical device. If it is particularly resistant, the use

of ice to make the bitumen even more 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 first be tested on an inconspicuous area of the paving.

Chewing gum: Chewing gum is one of the most difficult substances to remove from any surface. Newly discarded gum can be scraped off using a scraper. Hardened gum can be removed by chiseling it off the surface of the paving, using a hot water/steam cleaner or by chemical means. There are contract cleaning companies who specialize in this type of cleaning, and it is recommended that they be contacted directly for further details.

Graffiti and paint stains: Both paint and graffiti are difficult to remove. 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, for the paint involved, and the area washed with a concentrated detergent, taking care with the disposal of the run-off material. Most paint strippers are Sulphuric Acid based and attack the concrete. Dried paint should be scraped off as far as possible and an appropriate paint remover applied, used in accordance with the manufacturer's instructions. Paint manufacturers may be able to give more detailed advice on the removal of graffiti and it may be necessary to consult them if there are large areas of vandalism.

Epoxy and polyester stains: Areas of solidified epoxy or polyester resin can be removed by carefully burning off with a blowtorch. Care must be taken not to inhale any fumes given off or to overheat the concrete sufficient to cause explosive fracture of the coarse aggregate. If black stains remain after burning, this can be removed by scrubbing with soap and water. For larger areas, grit blasting may also have to be considered. This will not affect the durability of the material but may affect the

Scuff marks from vehicle tyres: These can normally be removed by steam cleaning or by scrubbing the area with hot water and a strong detergent.

micro-texture of the surface. It is advisable to test a small area before any large scale operation is undertaken.

Smoke, fire and tobacco stains: Normally these stains can be removed by scrubbing with soap and water. Where stains persist a mixture of scouring powder and household bleach can be used. When using bleach, it is important the bleach is washed from the area once cleaning is completed and the run-off disposed of carefully. Bleach is detrimental to plant life so care should be taken to protect adjacent lawns and borders.

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

Maintenance of joints:

Refilling joints: Jointing material may be lost from paving joints in early life during both dry and wet weather. In dry weather dry jointing material on the surface of the joint can be lost before it can consolidate. Particularly on steep slopes, the material can be washed from the surface of the joints during heavy rain in its early life. It is therefore important to inspect areas of new paving regularly in their early life and top up joints if necessary.

Sweeping: Until joints have become stabilised (naturally or chemically) the paving should only be brushed by hand. Mechanical sweepers, (see following section) and in particular sweepers with high suction forces should not be used in the early life of the pavement. If they are used, there is a real risk of loss of jointing material from between the paving units. This is particularly important for permeable pavements that have enlarged joints or voids.

Mechanical sweepers & scrubber-drier machines on

paved areas: Important considerations: The following recommendations deal with vehicles and associated equipment and their use in sweeping and washing paved and flagged footways, footpaths, pedestrian areas and roads:

• Equipment should be purpose designed to sweep the particular area. If there is any doubt about suitability the

vehicle manufacturer should be consulted. • Where possible, low pressure tyres should be fitted to reduce the risk of breaking or cracking flags.

• Tyres should be inflated according to the manufacturers recommendations, again to ensure minimum weight per unit area.

• Polypropylene, rather than wire, brushes should be used.

• Sweeping brush pressures should be set to the minimum required to suit the particular task, i.e. surfaces swept regularly will require a lower setting than those swept infrequently or covered with heavy deposits.

• Tyre and brush pressures should be regularly checked.

• When sweeping, engine speed should be set at the

minimum required to maintain vacuum (suction) pressure. • Operators, including reliefs, should be trained to operate machinery in accordance with manufacturer's recommendations.

• When equipment is stationary or left unattended, suction, brush rotation and water jetting equipment should be switched off to avoid the risk of damage to the paved area below the stationary equipment.

• For conventional block pavements or flag pavements in new or re-laid areas, agreement should be reached with the local highway authority on a period of manual cleaning to allow flags and block paving to become established, and the joints to seal with detritus. This period may be reduced by using either a water based bonding agent or elastomeric prepolymer sealant, and by agreement with the cleansing authority on an appropriate sweeping and sealant replacement regime.

• When water jetting equipment is used to wash areas, the jets or hand held lance should be directed at the surface at an angle not greater than 30° to the horizontal and diagonally across the joints (i.e. not parallel) using a high concentrate detergent solution. The area should be inspected after cleaning to ensure that joints remain full with any required jointing material replacement carried out after the pavement is dry.

Efflorescence: White patches appearing on the surface of concrete paving naturally cause concern. However, such concern is rarely justified in the long term, as the appearance is normally the result of 'efflorescence'.

Forms of Efflorescence The term 'efflorescence' is also

frequently used to describe whitish deposits or stains on building materials. However there are many forms of efflorescence, which have little in common, other than the fact that they result in a white discolouration. Efflorescence, as generally found on concrete paving products, is known as 'lime bloom.' It is a surface deposit on the concrete, seen either in the form of white patches or as a more general lightening in colour. When the latter effect is seen it is often misinterpreted as a fading or 'washing out' of the colour of pigmented concrete.

Formation of Lime Bloom Lime bloom, when it occurs, is a natural phenomenon brought about by the normal chemical reaction between cement and water. A product of this reaction is calcium hydroxide, 'lime,' which is slightly soluble in water. Under certain conditions it can migrate through damp concrete to the surface where it in turn reacts with atmospheric carbon dioxide to produce a deposit of calcium carbonate crystals. This deposit gives rise to the white patches or the overall lightening referred to earlier. It is normally extremely thin, and when wetted, the deposit becomes transparent and seems to disappear.

Occurrence The occurrence of lime bloom on the surface of concrete paving products is a spasmodic and unpredictable phenomenon not associated with poor quality manufacture. The weather is a significant factor with lime bloom forming more readily when concrete becomes wet and dries slowly; therefore occurrences are more frequent in winter months. Generally it only occurs in the early life of concrete paving products, and materials which have been in place for a year or more, without experiencing lime bloom, are unlikely to be affected. The phenomenon is temporary and superficial and will generally disappear in time without affecting concrete strength or durability.

Removal of Lime Bloom

Lime bloom can generally be expected to disappear over a period of time, depending on the environment to which the paving is subjected. Rainwater, being slightly acidic, dissolves the surface deposit. Where paving is fully exposed to the weather any efflorescence would normally be expected to disappear within the first year or two, although it might be longer for a sheltered site. Removal would

be accelerated by abrasion caused by foot or vehicular trafficking.

Equipment: The following minimum equipment is required: 1 Protective gloves and goggles 2 Appropriate footwear 3 Brush with soft bristles/plastic watering can for application 4 Supply of clean water

Procedure Proprietary cleaners can be used for more immediate removal of lime bloom. Most proprietary cleaning treatments contain acids and detergents, so it is important to ensure that the manufacturers' instructions and all relevant environmental regulations are followed. Incorrect or careless cleaning may result in injury or damage and discolouration to the surface of the concrete paving. It is advisable to carry out a test on a small and inconspicuous area of paving before undertaking cleaning over the complete area. The procedure is best carried out in cool conditions. When the paving is hot, rapid evaporation may lead to recurrence of deposits. Care should be taken when applying acid based cleaners to concrete. Acid attacks concrete and over application may alter the appearance of the paving. Wash off the residue and inspect the paving. In the case of stubborn or heavy deposits repeat the application as necessary. After final application of the cleaner wash off any residue with plenty of water to prevent staining, taking care to dispose of the run-off safely. Allow the paving to dry and inspect the surface and joints and resand/replace mortar to joints as necessary. Long term experience suggests that it is unlikely that lime bloom will recur after removal with acid based treatments. It is not possible, however, to give a guarantee against recurrence.

Preventing recurrence: A further possibility, which may be considered after successful cleaning, is the use of a sealant to minimise recurrence. Advice on the use of such treatments can be obtained from specialist companies.

Treatment

RESIN BOUND GRAVEL



Tuscan Pebble / Rhine Gold

SUPPLIER:

Addagrip T: 01825 761333 E: sales@addagrip.co.uk

DESCRIPTION: "ADDASET" Resin Bound Gravel



ROUTINE MAINTENANCE

The Addaset surface should be regularly swept clean, removing leaves and detritus material in order to prevent moss growth. If the surface has been contaminated with chewing gum it is best removed by freezing and chipping off as necessary.

VEGETATION

Any moss or weed growth that occurs should be treated using an appropriate herbicide. Any ingrained algal growth can be removed and the colour of the original Addaset surface restored by applying a strong bleach solution. The bleach solution however should be applied in accordance with manufacturers guidelines and local environmental constraints. After application with the bleach the surface must be rinsed well with clean water.

Please note that staining may occur from tanning if surfaces are not kept clean from leaf debris, conkers etc.

NORMAL/ABNORMAL USE

The Addaset surface has been designed for normal pedestrian and vehicular traffic use, therefore protection should be provided wherever possible against abnormal usage. Abnormal usage applies to heavy objects such as skips, these should not be dragged across the surface, the Addaset must be protected in this instance to avoid any impact damage, staining etc. Light coloured Addaset Blends may show tyre marks, removal by pressure washing as detailed below may be required.

GENERAL CLEANING

General cleaning of the surface can be carried out by cold pressure washing up to a maximum 150 bar rating to remove dirt and grime. The water should be applied using a fan type lance which should be kept 200mm above the installed Addaset. Care should be taken however to prevent damage to the surface with excessive water pressure. If the surface is contaminated with any cement or concrete marks these can be removed using dilute hydrochloric acid or a proprietary cement remover. In all cases we recommend that a small area is carried out first to confirm suitability.

Oil stains should be removed as soon as possible, use a mild detergent as required to prevent possible staining.

DAMAGE REPAIR

Should the surface be damaged we can supply small repair kits and we would suggest that these are carried out at the earliest convenience.

SELF BINDING GRAVEL



Silver Grey

SUPPLIER: CED T: 01773 769916 E: sales@ced.ltd.uk

DESCRIPTION:

SuperCEDEC

LOCATION:

Tree Pits in Hard Standing



A: NEW (UP TO 3 MONTHS)

Correct maintenance for the newly laid SuperCEDEC® is essential and any damage must be repaired promptly. If the new surface is allowed to dry out there is a possibility that the surface may tend to break up through lack of bonding. Generally not required, but occasionally, re-watering and recompacting may be necessary until the surface is entirely consolidated. Light brushing with a soft broom may be carried out if necessary. Any settlement should made good using additional SuperCEDEC® and laid in acordance with our laying recommednations.

NEVER COMPACT A DRY SURFACE!

A mature surface will require a different regime of maintenance to a newly laid one.

B: ESTABLISHED SURFACE

Collect large litter with a spiked litter collector. Raking with a spring box rake will pick up small pieces of litter, cigarette ends, chewing gum, twigs, leaves etc.

DO NOT USE A VACUUM SYSTEM.

A "Leaf Blower" on low power may also be used, except under very dry conditions.

Should the surface become hard and impervious and there be some puddling, thoroughly spike the surface with a fork to improve drainage. If the SuperCEDEC[®] has become seriously contaminated with soil or detritus, it may need to be replaced. If erosion has occurred, it's prudent to identify the cause of erosion before re-laying. SuperCEDEC[®] is a graded aggregate, so wackerplates or non-vibratory rollers must be used. Do NOT use a vibratory roller with the vibrate function turned on as this will deform the surface layer.

Any area of SuperCEDEC[®] must always be constrained by a raised surround. As an example, where used adjacent to paving always leave the surface of the SuperCEDEC[®] at a slightly lower level than the paving to minimise migration of the loose chips onto the paving. 5 to 10mm is normally sufficient.

As with any loose material, SuperCEDEC[®] may be picked up to some degree by shoes, especially in damp conditions. If being used near a building entrance, ensure that adequate foot cleaning or transitional areas are provided.

SuperCEDEC[®] should not normally be laid on a slope greater than 1:15. If necessary, steps should be used to reduce the steepness of the slope. On slopes of between 1:15 and 1:20, some migration of the SuperCEDEC[®] may be evident with use over time.

LFC Anfield Stadium Expansion

GRANITE





SUPPLIER:

Hardscape T: 0845 260 1748 E: enq@hardscape.co.uk

DESCRIPTION: Granite to podium step treads and nosing

COLOUR RANGE CONSIDERED:

Royal White / Tino Red



From New

Hardscape advise that newly laid granite is deep cleaned using low pressure steam and impregnated using Pavesaver or Pavesaver Ultra. This will protect the surface from contamination and prevent staining, where areas are susceptible to heavy staining such as outside eateries it is advised that 2 applications of Pavesaver Ultra is specified.

The process of reapplication should always be carried out within a 5 years.

Granite that is protected with Pavesaver can be maintained on a daily or weekly basis using Grimelifter, this can be applied through nebular spray bottles, scrubber driers and street washing machines using soft bristle brushes, preferably cylindrical brush head as this will maintain a good surface finish.

Dirt Removal

The removal of deep seated stains can be removed using Grimelifter Ultra applied neat to the area and left for 20 minutes and then washed off using a pressure washer or a mop system continually using clean water.

Chewing gum removal should be carried out using low pressure steam using either a hot water pressure washer or steam generator for the best results.

Hardscape advises that a good housekeeping policy is in place that ensures regular / weekly cleaning rather than a singular annual clean.



Routine Maintenance

The system does not require routine maintenance. However, any damage must be repaired at the earliest possibility.

SUPPLIER: Miles Macadam 01948 820489

DESCRIPTION:

"HARDIPAVE" industrial strength asphalt

COLOUR RANGE CONSIDERED:

Black

LOCATION:



In the event of damage during the installation or during service, the system can be repaired by removing the damaged area and reinstalling the system in accordance with the manufacturer's specifications.

MACADAM



SUPPLIER: To Contractor's specification

DESCRIPTION: Black-top rolled macadam

COLOUR RANGE CONSIDERED: Black

LOCATION:

To Carpark areas on Anfield Road



ROUTINE MAINTENANCE

Brushing and jet washing the surface of the macadam surface to remove contaminants and debris as required.

More thorough maintenance would include repairs , repainting and reline marking.

Proprietory coatings can be applied to refresh the appearance of macadam.

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IN-SITU CAST CONCRETE



SUPPLIER: To Engineer's specification

DESCRIPTION: In-situ cast concrete walls / seating elements

COLOUR:

Grey

LOCATION:

To Anfield Plaza and Grove areas

SURFACE SEALER

- Manufacturer: HRL t. 01484 860044.
- Product reference: see E10.416J.
- Substrate:

- Moisture content: As recommended by sealer manufacturer. Test relative humidity to BS 8203, Annex A where required to verify suitability. - Condition prior to application: Cured, clean and free from contaminants.

• Primer: To be advised by Sealant supplier.

• Application: Evenly to dry surfaces to form an effective seal but without a glossy finish

Anti Graffitti coating to all concrete surfaces and furniture, in a non-colouring, matt finish.

For concrete Plinths it has been assumed that all of the surfaces have been pre-treated with dirt and stain resistant coating on completion of construction. Products include HRL Colourfresh and HRL Colortec Max dirt and stain resisting coating or equal and approved.

GENERAL MAINTENANCE

1. Provided that process has been correctly followed, ongoing maintenance should be minimal.

Sweeping of loose dirt and washing down 2. with low pressure power wash equipment is generally sufficient for normal everyday upkeep.

The protective coating would normally not 3. need to be re-applied for a period of 5 years or more, unless some areas are subject to particularly aggressive use or traffic. In that situation, it may be necessary to re-apply more frequently. Should this occur, the procedure would be to strip back any remaining sealer in full panels, between joints and re-apply over the whole panel area, rather than simply over specific areas.

Where damage or serious contamination 4. arises from vandalism or other abuse, and aggressive cleaning to remove the contamination is necessary, the affected areas should always be resealed on completion.

Use of mechanical cleaning machinery is 5. generally acceptable although cleaning with steel or ultra abrasive brush bristles should be avoided.

