



S M A R T S U R F A C E<sup>®</sup>

**MACKENZIE**  
CONSTRUCTION  
SAFE IN THE KNOWLEDGE

# S M R T S U R F C E <sup>®</sup>

## FREQUENTLY ASKED QUESTIONS

### **What is Mackenzie's 'Smart Surface'®?**

Mackenzie Construction's 'Smart Surface'® service provides a proven, fast and innovative binding solution that delivers the most efficient and sustainable option for surfacing and ensures best value for money in the short and long term.

The service is applied using the safety, integrity and efficiency standards that Mackenzie Construction are renowned to deliver in the industry and utilises our expert knowledge and experience to deliver an innovative, sustainable and value-adding solution which makes the most of your time and materials.

### **What is the active ingredient, Ecoproactive®?**

Ecoproactive® is an inorganic latent hydraulic binder for soil stabilisation applications and pavement layers.

### **Performance under freeze/thaw conditions**

The stabilised material performs well under freeze/thaw conditions, achieving a strength greater than 2N/mm. It is therefore not deemed to be susceptible to frost heave. This applies even if the constituent parts of the stabilised material may themselves be frost susceptible.

### **Application parameters e.g. temp, moisture (from rain and within ground)**

Application is not advised where the temperature is 1°C and falling. Ideal conditions would be 5°C and rising.

A pre-application laboratory test (Proctor Test - the optimal moisture content at which any given material will become most dense and achieve its maximum dry density) will calculate the MDD (maximum dry density), NMC (natural moisture content) and OMC (optimum moisture content); providing the target figures for the application. To achieve optimum compaction results, an OMC plus 1% is advisable; making additional allowance for some evaporation that will occur when working with the stabilised material and compacting to desired falls/surface profile.

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### Indicative cost per square metre for Ecoproactive?

Not unusually, this will vary on a site per site basis and will fluctuate due to access restrictions, type and size of plant, site security requirements, suitability of existing route/path material, requirement for importation of stone to add volume (typically 20mm scalpings), percentage of Ecoproactive<sup>®</sup> powder required and surface application e.g. 6mm grit (if any). MacKenzie Construction Ltd. are continually developing procedures that will refine and reduce the output cost within a wider range of application.

### Application of product to small areas (e.g. <50sqm)

Ecoproactive<sup>®</sup> is typically not designed for this type of application. That said, it is possible to dry batch clean stone with the Ecoproactive<sup>®</sup> powder; akin to more traditional patching repair work. This process of dry batching limited qualities is being undertaken on the Clyde River Walkway to infill treads on some newly constructed ramped timber sleeper steps.

### What is the moisture content/absorbency/porosity of the material?

Refer to Proctor test below:

Rapid Absorption Test	24 hours less than 1%
Rapid Absorption Test	48 hours less than 1.5%
Rapid Absorption Test	72 hours less than 1.75%

Capillary Absorption Test 7 days	less than 0.3mg/square millimetre
Capillary Absorption Test 28 days	less than 0.50mg/square millimetre
Permeability	1.45 x 10 <sup>-9</sup>

### How suitable is it for the application of surface layers or coatings?

Suitable size for further finish application of 10mm bituminous macadam, spray and chip application. HRA sand carpet finish all with application of tack coat of bituminous emulsion before applications.

### Strength of path edges? Paths typically need a wider base layer to protect the surface layer from breaking along the edges so how does this material perform without that formed base layer?

Ecoproactive<sup>®</sup> stabilisation process does not preclude the use of sound engineering principals. It needs to have minimum 150mm overlap for compaction purposes or the edge will roll away and you will not meet profile requirements for wearing course applications if no side restraining i.e. kerb or timber edging in place. If used as a base course or a sub base the material will be held in position by the adjoining material bed.

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### **Will pernicious weeds penetrate this material and will weed growth impact on edge stability?**

If properly compacted to 100% MDD, there will be no opportunity for organic intrusions as there will be no air voids, or moisture, available for plant growth.

### **Life expectancy of the material/path under normal conditions?**

Under normal path user conditions, the application will have an expected lifespan of 20+ years.

### **How easy is it to form a camber to the path surface?**

Camber is easily formed but, typical will most path construction and depending on the designed width, can be problematic to roll and may leave crossover roller marks and/or result in the crown being flattened. Optimum surface compaction is achieved using a 120 roller which can flatten the camber unless the formation layer is sufficiently robust and/or additional sub-base strengthening has taken place e.g. additional infill, geotextile/geogrid.

It is suggested that the initial base material rotoavation; application of Ecoproactive® stabilising powder; addition of water to the mix (where required); further rotoavation; surface profiling and final compaction should take place from low to high side of the path. Experience shows that this gives the best finish results and typically eliminates any roller marks.