

# CEDEC Footpath Gravel™



## INTRODUCTION

The principle of CEDEC footpath gravels is to form a firm but porous structure that retains moisture yet allows any excess to flow through. The materials used are specially graded decorative aggregates ideal for areas where the traffic is too heavy for grass but where a natural appearance is desired.

CEDEC footpath gravels comprise granite and quartzite, which are chemically inert and durable and will not affect the pH value of the surrounding soil. This is important where newly planted trees or pH-sensitive plants are sited. Its porous nature is good for trees generally.

In order to function effectively, CEDEC needs to be rained upon and walked upon. It will not be effective indoors or under permanent shelter.

Coverage of CEDEC is approximately 10 m<sup>2</sup> per tonne, compaction being about 25%.

The following specification is based on best practice and may vary according to the particular situation.

## HISTORY

CEDEC was developed following a request during the construction of Canary Wharf for a footpath gravel that was free of limestone so as not to affect the pH of the soil around the trees. It was suggested that it should be something like the surface upon which the French play boules. Initially we were somewhat perplexed as to how such a material would work without the 'gluing' effect found in the British limestone footpath gravels then available and with which we were familiar. Nevertheless in France there were hard limestones used that did not "set". Two British aggregates (a silver-grey third has now been added to the original red and gold, all being quartzite and/or granite) were found to have the correct grading and shape profiles to pack efficiently and one was chosen for Cabot Square at Canary Wharf. It worked well and, not long after, other designers started to ask for the same material. Almost entirely through word of mouth CEDEC has developed into a standard footpath gravel widely used in public landscapes and sometimes in private gardens too.

In using such a material, it is useful to understand how it works. CEDEC is a crushed aggregate sized below 6mm. It has a lot of very fine particles included. The range of sizes and shapes is such that there are relatively few interstices and a fully compacted bulk density of up to 2 tonnes per m<sup>3</sup> may be expected. CEDEC is placed upon a sub-base which must itself be porous. This sub-base does two things. It provides support to the CEDEC and allows water passing through the porous CEDEC

to continue down into the ground. In this context it is necessary to appreciate that CEDEC and/or its sub-base should not be laid on concrete, clay or any impervious material. As has been said earlier, CEDEC does not set, it packs. Therefore it remains capable of being moved about, whether by a heel or turning tyres. However, CEDEC is not harmed by this - there is nothing to break so it can always be put back in place. When laid initially, CEDEC should be rolled as indicated in the laying instructions. This gives a useful start to the compaction process that will be continued by the processes of rain and being walked upon. If the area is always dry, CEDEC is not suitable. If the footpath is untrodden for a significant period especially before it is first used, the material may appear to become slightly 'fluffy'. If this happens, it can be corrected by using the footpath normally. If the packing process has to be speeded up, then re-rolling as originally indicated may be undertaken. The rolling process in the laying is not really essential to the production of an effective footpath and can be reduced or omitted if near trees. It will simply take longer for the CEDEC to pack. When it is fully packed, CEDEC will feel firm but still have a loose crumb on the surface.

## **DESIGN**

There are some matters to bear in mind when using CEDEC. Particles may get lodged in shoes, as can any grit, so care should be taken if using CEDEC near quality wood or stone floors. If the distance between the CEDEC and these floors is small, then shoes must be taken off or thoroughly cleaned.

CEDEC can migrate if continually encouraged in one direction - generally downhill. In such cases, some form of step will need to be introduced to lessen the slope. In essence CEDEC must be constrained but even so, it can be kicked onto adjoining hard paving surfaces (for example smooth concrete or stone) on which it is able to act like marbles and make one's footing rather unsatisfactory.

We have on occasions suggested that some granite setts be introduced as a buffer between the CEDEC path and the smooth surfaces, these setts being laid with the CEDEC as the bedding and jointing medium for which it is well suited.

In general, CEDEC seems to be very forgiving of maltreatment. We know of customers who have laid it 75mm deep instead of 50mm and even of it being laid 100mm deep on a membrane, with a layer of lightweight rounded aggregate underneath. This last was on a roof. The water flow between the lightweight aggregate particles was sufficient. We have customers who have used it as a driveway, contrary to our advice and knowing that with power steering, some problems could arise. Nevertheless on viewing the result some eight years later and after much use, we were disconcerted to see how well the CEDEC still functioned.

We do not, however, recommend its use for traffic generally, though once well-compacted it will not be harmed in any significant fashion if it is driven over by a fire engine or articulated lorry. If it is roughed up, simply spread it back to its correct levels. It is, however, not tarmac. Many are the situations in which it can be used but not everywhere. It can be used by wheelchairs, but it is harder work than a hard smooth surface. It has, though, been used in a care environment.

## **FOUNDATION**

The foundation layer should be laid to a uniform crossfall or crown as required on the finished path. This layer should be firm enough to take the subsequent layers and compacting machinery without deformation and a geotextile should be used if ground conditions so indicate.

The thickness of the base layer will depend on the maximum vehicle weight likely to cross the footpath gravel but a compacted 150mm is suitable for pedestrian and light maintenance vehicle use. A free draining layer of specially graded 28-0mm from the same source as the surface layer is the best practice, however other inert materials with similar sizing may be suitable. A 1500kg non-vibratory roller should be used, but being careful to avoid damage to irrigation systems if installed. If any irregularities are found in the base layer, these should be rectified with the correct base layer material and not the surface material.

CEDEC footpath gravel should be supplied in a thoroughly mixed and moist state. It must not be laid if dry and should be laid to a thickness of 50mm after compaction. Initial compaction should be carried out BEFORE watering takes place and by at most two passes of non-vibratory roller not exceeding 500kg in weight. After initial compaction, which should be sufficient to prevent fines being washed through the surface, thorough saturation is necessary with water by a hose fitted with a rose sprayer, or similar method, taking care to prevent disturbance of the top layer.

Final compaction of the saturated surface (5 or 6 passes) is to be with a non-vibratory roller with a 500kg axle weight on the saturated surface. A short delay (up to 30 minutes) may be necessary after watering to prevent pick-up on the roller. Two further cycles of watering and rolling (5 or 6 passes each) should take place within one week after lying.

## **MAINTENANCE**

### **A: NEW (UP TO 3 MONTHS)**

Correct maintenance for the newly laid footpath gravel is essential and 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. Regular maintenance by watering with a hose fitted with a rose sprayer, or similar method, plus rolling with a non-vibratory roller, maximum axle weight 500kg (5 or 6 passes) will be necessary until the surface is entirely consolidated. Drag matting or brushing should be carried out if necessary. Any depressions should be lifted and made good additional surfacing material as necessary.

**NEVER ROLL A DRY SURFACE**

## **B: ESTABLISHED SURFACE**

A mature surface will require a different regime of maintenance to a newly laid one. It will be mostly to prevent potholes and to repair erosion. If potholes do occur, it is advisable to cut out the affected areas and replace them with new footpath gravel, rolling with a 500kg non-vibratory roller.

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. As an indication a man should clean about 150 square metres in an hour.

In areas of particularly heavy use, the surface may become too hard. Should this occur and there be some puddling, thoroughly spike the surface with a fork to improve drainage.

The base layers and surfaces both use graded aggregates therefore non-vibratory rollers only must be used.

Any area of CEDEC must always be constrained by a raised surround. As an example, where used adjacent to paving always make the surface of the CEDEC at a lower level than the paving to prevent migration of the loose chips onto the paving.

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

Because CEDEC relies on its own binding qualities for stability, it is best as a level surface. It should not normally be laid on a slope greater than 1 in 25. If appropriate, steps should be used to reduce the steepness of the slope.

CEDEC is not recommended where lateral forces are applied to the compacted surface by frequent wheeled traffic. Loss of cohesion of the surface, and hence friability leading to erosion, can occur where any wheeled traffic is accelerating, slowing down or turning.

CEDEC is currently available as CEDEC Red, CEDEC Gold and CEDEC Silver.

For further information concerning CEDEC or a location where CEDEC is available for viewing, please call one of our four nationwide depots.

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