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Technical Manual – Section 9 Lytag[®] for Structural Fill

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Introduction

Lytag lightweight aggregate (LWA) is widely used as a structural fill to raise existing surfaces to achieve new falls or to construct ramps, provide a deep screed within which services may be buried, infill between items such as bridge beams to provide a level surface for the structural deck, formation of architectural, infill for raised access flooring and permeable back fill for retaining walls, bridge abutments.

This section details the properties and applications of Lytag lightweight aggregate granular material when bonded with cement.

Cement bonded Lytag LWA

Properties

Table 9.1 - Typical Strengths and Densities of No Fines LWA Concrete.

Mix (vol.)	Application	No-fines Concrete (N/mm ²)	Approximate Density of No-fines (kg/m ³)
10:1	Standard	7.0	1060
8:1	Medium Strength	9.0	1120
6:1	High Strength	11.0	1180

There is only sufficient water in the mix to hydrate the cement so normal formwork is all that is required. No special precautions are needed to make it watertight. There is no limit to the depth that can be placed in any one operation but raking and tamping should be carried out at approximately 300mm deep intervals. If a flat finished surface is required then a 15mm nominal cement: sand topping (1:4 by weight) can be applied to the Lytag no-fines concrete.

Lytag no-fines concrete does not self-settle and the average drying shrinkage is 0.04%. Thermal conductivity or μ value of Lytag no-fines concrete can be taken as 1.29 W/mK for a 10:1, 0.35 W/mK for an 8:1 and 0.40W/mK for a 6:1.

Lytag no-fines concrete is free draining so, in the event of water being present, water pressures are minimised.

Lytag is rounded in shape, therefore self-settlement is minimal after raking and tamping.



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Table 9.2 - Typical dry batch weights per cubic metre of compacted Lytag no- fines concrete.

Figure 7.1 - Weight of Lytag no fines base coat

Mix (vol.)	Approximate Weight 4/8mm Lytag (kg)	Cement CEMI (kg)	Approx. Total Water Addition (litres)
10:1	820	150	110
8:1	820	200	110
6:1	820	250	110

As a guide only, a figure of 710 kg/m³ is taken as the dry loose bulk density of Lytag. Depending on the grade there can be small density variations and customers are advised to check with the Lytag-sales office.

It is recommended that the user confirms the performance of the proposed mix by laboratory trials.

Mixing

For site mixing, Lytag no-fines concrete is best mixed using a motorised forced action paddle mixer. The Lytag pellets should be placed in the mixer and the water absorption satisfied by adding water until the pellets begin to shine with surface moisture. The required proportion of cement is then added and mixed until uniformly distributed. Further water is then added until the pellets are covered with a shiny cement grout coating. If too much water is added the cement grout will segregate from the Lytag - too little water will adversely affect the bond between individual pellets. Alternatively a ready mixed concrete producer can supply Lytag no-fines concrete.

Further information can be had in our Guidance Note – No Fines Site Batching.

Examples of applications

- Levelling of irregular surfaces.
- Raising existing surfaces to achieve new falls or to construct ramps.
- Provide a deep screed within which services may be buried.
- Infill between items such as bridge beams to provide a level surface for the structural deck.
- Formation of architectural features on suspended slabs. NB usually faced with brick work or paving.
- Infill for raised access flooring.
- Permeable back fill for retaining walls, bridge abutments etc.



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