

FOAM CONCRETE



*THE VERSATILE LIGHTWEIGHT
SOLUTION*

WHAT IS FOAM CONCRETE

- One has to think of foam concrete as being a cement-bonded material that is manufactured by blending a very fluid cement paste (the slurry) or mortar with a separately manufactured foam (resembling shaving lather) into a grey mousse with high fluidity. The volume between the slurry and the foam determines the density of the foam concrete. The presence of the cement causes the material to be cohesive (strength/stiffness) after hydration of the cement. The matrix can be best described as "with tiny air bubbles surrounded by cement slurry".

ENERGY ABSORBING QUALITIES

- Due to the dense cell structure of foam concrete, as the material is compressed during an impact, the resistance of the foam concrete increases, thereby absorbing kinetic energy. Since hardened foam concrete is monolithic, the material is not vulnerable to liquefaction or settlement.

APPEARANCE

- Fresh foam concrete looks like a thin grey mousse.

CONSTITUENTS

- In addition to water and specified varieties of cement, other constituents such as pulverised fuel ash (Pfa) Lytag fines and sands can be used together with our foaming agents Provoton and Synvoton.



materials for foam concrete, they are processed in a responsible manner to ensure that they cannot pollute the environment.



ENVIRONMENTALLY FRIENDLY

- Foam Concrete Ltd. is a leading company in the UK in the use of recycled waste substances like pulverised fuel ash and lytag fines. In using these substances as raw

ROADS

The pictures show before and after shots of a road being in-filled on a project in London. The mix used was a 500 kg/m³ density strength 1N/mm² @ 28 days foam concrete. Once cured, it was covered with a type one stone and black topped. The combination of lightweight, ease of placement and self levelling properties requiring no vibration or compaction renders foam concrete as an excellent foundation for roads.



LIGHTWEIGHT FOUNDATIONS

Construction foundations of foam concrete can be based on the principle of equilibrium. Heavy soil is excavated and replaced by lightweight foam concrete.

The combined weight of the foam concrete and the structure built upon it equates to the weight of the original soil removed. The result is a construction with a minimum of settlement.

SUSCEPTIBILITY TO BREAKDOWN

Unlike some synthetic lightweight foams, hardened foam concrete is not susceptible to breakdown due to hydrocarbons, bacteria or fungi. It is insect, rodent and fire proof.

GOOD FREEZE/THAW PROPERTIES

Primarily due to the low water absorption of foam concrete, the capillary water absorption into accessible pores of the material never reaches a point of critical saturation at which point damage would occur.

THERMAL INSULATING PROPERTIES

Since the makeup of low density foam concrete contains a very large air content in the closed cell structure (up to 80% air), the material provides for good insulation properties. The high air content also provides for good sound insulating and excellent fire resistance qualities of the material.

ANNULAR FILLS

Due to the extreme fluidity of foam concrete, it is a very effective material for grouting pipes underground or in tunnels.

APPLICATIONS

SUITABLE APPLICATIONS FOR FOAM CONCRETE

- Filling underground voids (mines)
- Filling redundant sewers, culverts, subways
- Trench re-instatement
- Filling spandrel arches on bridges and viaducts
- Soil replacement/stabilisation
- Annulus filling of pipes
- Tunnel liner backfill
- Harbour infill
- Retaining walls backfill
- Road foundations
- Roof screeds and floor insulation



SOME MAIN FEATURES OF FOAM CONCRETE

- No vibration/compaction required
- Follows every sub grade shape
- Fills all cavities/voids/seams over long distance
- Fast and settlement free construction
- Low requirement for raw material per volume unit
- Good heat insulation/high air content
- Slab behaviour: spreads loads
- Loads on top of foam concrete body are not deflected sideways
- Good thermal insulation properties
- High plasticity/self levelling
- Can produce a smooth finish
- No settlement in foundations
- Material does not creep under sustained load as does plastic foam insulation
- Good freeze thaw properties



FOAM CONCRETE ADVANTAGES

Good compressive strengths with low densities

With its low density, foam concrete imposes little vertical stress on the substructure, a particularly important issue in areas sensitive to settlement.

Rigid well-bonded body

Foam concrete forms a rigid, well-bonded body after gelling (hydrating); thus, it is effectively a monolithic material which does not impose lateral loads on adjacent structures. The foam concrete can be constructed into various formations and profiles by forming and stepping of successive lifts.

No compaction required

In some cases mechanical compaction can be difficult and unsafe due to limited or inaccessible areas. In excavations with poor soil, foam concrete forms a 100% stable foundation.

High fluidity

Foam concrete is easily pumped with relatively low pressure, via hoses over long distances. For applications over 300 metres such as pipes in tunnel backfill, the slurry is pumped through pipes with pre-formed foam injected near the point of placement. The material is naturally self-levelling and fills the smallest voids, cavities and seams.

Rapid installation

High volume production and placement (via hoses) of foam concrete is a continuous operation from the mobile central plant. Since the foam is the largest volume contributor in the foam concrete, limited deliveries of the raw material are required, which results in minimum disruption to the construction site.

Cost saving

Foam concrete is an economically viable solution, particularly in large volume applications. Mix designs are tailor-made for each project. Minimal lateral loading enables reduced building costs for earth retaining structures. Construction on marginal ground reducing the need for piled foundations. Lower maintenance costs because of the durability of foam concrete and the lack of settlement. Innovation methods to correct or prevent subsidence in lieu of expensive treatments. High volume equipment with rapid installation reduces installed unit cost.

EQUIPMENT - STRENGTHS/DENSITIES

THE WET METHOD

- With the wet method the slurry required for foam concrete is manufactured by the concrete companies and transported to site in truckmixers. A foam gun is placed into the rear of the mixer and the rotation of the drum blends the foam with the slurry producing a fluid self levelling material.



THE DRY METHOD

- Pre-blended powder is supplied to site in tankers, blown into a silo and a slurry is manufactured as above. Injecting the foam into the discharge pipeline produces lightweight foam concrete.



DENSITIES

- Introducing foam into the slurry results in a lightweight, stable cellular material with densities ranging from 300-1600kg/m³ and strengths from 0.2 N/mm² - 12.0 + N/mm² at 28 days.

FOR MORE INFORMATION CONTACT

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