

L&Q INTERNATIONAL, INC.

ADVANCED SOIL SOLUTIONS

Compressed Earthen Block

Conventional methods and specifications tend to recommend familiar technologies and building materials, no matter how expensive they might prove to be. This normally results in raising the cost of construction. Today's tight budgets demand an innovative approach to building that maximizes cost-efficiencies and provides an environmentally friendly solution.

CEB is ideal for residential home building – It is elegant, economical and environmentally friendly. Surfaces can be made water-proof with new environmentally friendly nanotechnologies.

CEB, while ideal for permanent structures, also offers a means of quickly erecting buildings and/or structures in case of emergencies such as floods where housing and/or temporary walls may be needed. CEB construction is ideal in situations where a building may be needed for a short period of time. It can be quickly built and then bulldozed back to the original soil when not needed, leaving virtually no environmental footprint.



COMPRESSED EARTH BLOCKS (CEB)

Using a proven but little known U.S. technology, high quality building blocks can be rapidly produced from soil. These earthen construction blocks can provide a new means of building environmentally friendly structures such as buildings and walls.



CURRENT SITUATION / PROBLEM

Many construction projects use cement block as a standard building material and it is often by default the building material of choice despite its expense. Cement block, however, has a number of drawbacks as producing cement blocks and building the structure requires:

- ◆ A manufacturing plant
- ◆ Expensive fuel and a means to transport blocks to building sites.
- ◆ Water, which can be scarce on-site, to mix mortar for the blocks.
- ◆ Relatively skilled labor.



COMPRESSED EARTHEN BLOCK ADVANTAGES

- ◆ Compressed Earthen Block (CEB) is perfect for the construction of homes, schools, public facilities and security walls.
- ◆ CEB equipment is mobile and easily transported and can significantly improve building efforts in both urban and rural areas.
- ◆ CEBs can be produced for a fraction of the cost of cement block (At least 50% cost savings in materials)
- ◆ Green construction leaves virtually no environmental footprint
- ◆ Carbon neutral as CEBs require minimal fuel to manufacture and there is no need to transport them to the site
- ◆ Exceptional thermal insulation (equivalent to R-36)
- ◆ Excellent soundproofing
- ◆ Equipment is mobile and rugged
- ◆ Local labor with few skills can be employed in the construction process reducing costs

THE COMPRESSED EARTHEN BLOCK SOLUTION

- ◆ Instead of cement blocks, durable and thermally insulated Compressed Earthen Block can be produced on-site, using minimal water and fuel resources.
- ◆ CEB is the foundation of environmentally friendly construction, as they leave little or no footprint behind and consume few resources other than soil.
- ◆ Earth blocks are made by rugged, mobile machines that compress a wide variety of clay soils at 1,250 lbs. per square inch.
- ◆ Production capacity ranges from 240 to 480 blocks per hour, depending on the size of the machine used, and consumes a maximum of 1.5 gallons of diesel fuel per hour.
- ◆ Large machine blocks weigh between 25 and 40 pounds each and measure:
 - 7" x 14" x (2" to 4.5")
 - 8" x 14" x (2" to 4.5")
 - 10" x 14" x (2" to 4.5")Small machine blocks are 6" x 12" x (2" to 4.5")
- ◆ CEB can be used to construct load-bearing walls up to 16 feet high.
- ◆ Water use is minimal and is usually only required used in making a mud slurry that acts as mortar between blocks.

COMPRESSED EARTHEN BLOCKS VS CEMENT

- ◆ Compressed Earthen Blocks are more affordable.
- ◆ Cement block readily conducts heat and cold, making



commercial and public buildings expensive to heat or cool. In contrast the higher thermal value of earthen block structures (R-36 vs. cement block's R-18 or less) keeps them cooler when it's hot; warmer when it's cold, thus saving money on air conditioning, heating units, and insulation materials.

- ◆ Materials used to produce earthen block (soil and water) are widely available.
- ◆ Earthen block production requires fewer skilled workers and can employ many non-skilled workers, thus reducing building costs.
- ◆ Equipment to produce earthen blocks can be used right at the building site, greatly saving material transportation costs.

CEB's ADDITIONAL QUALITIES

- ◆ CEB's smooth surface allows for the use of a variety of sealing treatments, including paint, stucco and new nanotechnologies that bind with the CEB providing a permanent water repellent surface. These coatings create a durable surface CEB construction is extremely fire-resistant.
- ◆ CEB structures greatly reduce invasive outside noise.
- ◆ Earthquake resistant construction techniques have been developed for CEB and are easy to implement.
- ◆ Rodent and insect intrusion is curtailed because fewer potential breaches result from earthen block construction.

COSTS

- ◆ Our analysis has shown that the cost of an earthen block can be as little as 30% of the cost of a cement block.
- ◆ L&Q can provide an estimate as to cost savings for an individual project.



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L&Q provides a suite of cost-effective soil products and solutions that address critical infrastructure needs.