



# Replacing Structural & Lightweight Fill

Engineered CUPOLEX®  
Solutions to Structural &  
Lightweight Fill Replacement



 CUPOLEX®

# CUPOLEX®

## Fill Replacement Solutions

CUPOLEX® replaces expensive and time-consuming engineering of structural and lightweight fill required to support floor slabs on grades or on structural decks.

An engineered CUPOLEX® system provides an easy, efficient and fast solution for replacing structural or lightweight fill. The CUPOLEX® engineered floor system can be designed for depths up to 2.5m (100 inches). The cutting-edge forming system is very simple to assemble, quickly interlocks and connects to each other composing a self-bearing structure ready for the placement of the engineered concrete floor slab. The engineered elevated CUPOLEX® formed concrete floor slab supported by the matrix of arches, ribs and columns formed by the system is designed for any load bearing requirements.

### FEATURES

The elevated concrete floor slab structure and the void created below the floor slab can also be used for various purposes and applications, such as :

- Stormwater capture
- Sub-floor utilities
- HVAC systems
- Sub-floor soil gas mitigation venting systems

### REPLACING STRUCTURAL FILL

Though improperly compacted fill is the top cause of structural failures, it is also avoidable. CUPOLEX® can help you with the worst soil conditions

- Eliminates potential environmental concerns due to possible contamination of existing or imported soil fill that can generate methane when high organic content soils or putrescible materials (garbage) may be a concern
- Eliminates geotechnical concerns related to poor soil bearing capacity and structural settlement
- Eliminates financial concerns due to excavation and disposal and/or increased construction costs.

### REPLACING LIGHTWEIGHT FILL

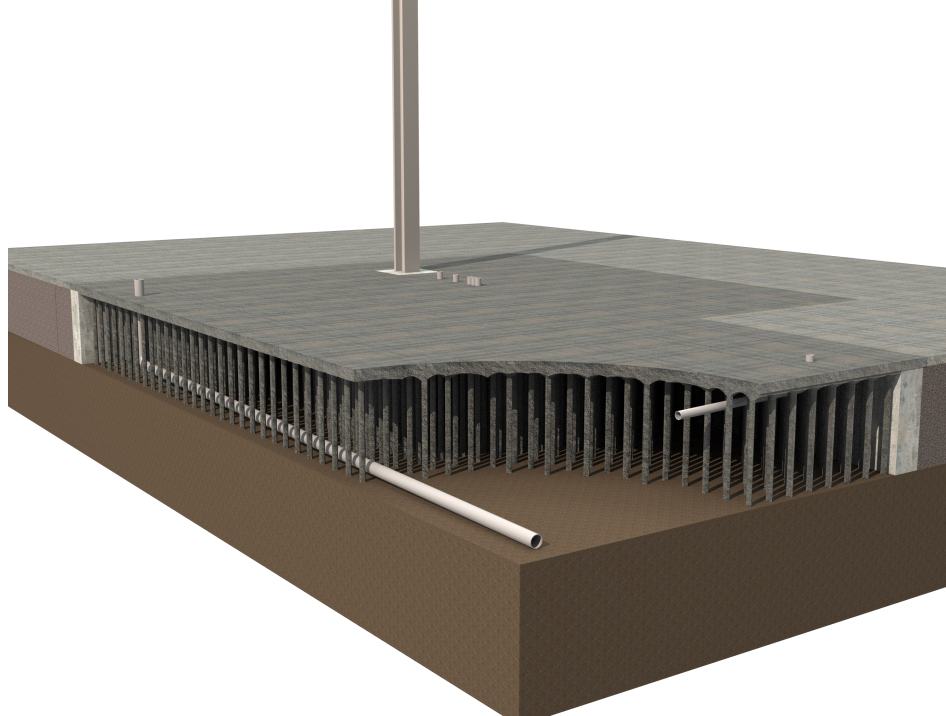
CUPOLEX® replaces expensive and time-consuming engineering and placement of lightweight fill required to support slabs on building structures.

- CUPOLEX® replaces expensive foam insulation and EPS blocks typically used for creating these floating concrete slabs when weight limit is a factor.
- CUPOLEX® also reduces the “dead load” on top of the structure and eliminates the need for costly design analysis and construction methods associated with higher strength, load bearing structures.
- CUPOLEX® is well suited as a structural void fill in concrete forming operations.
- Concrete crews can easily fabricate virtually any shape or slope and any elevation changes can be accommodated.

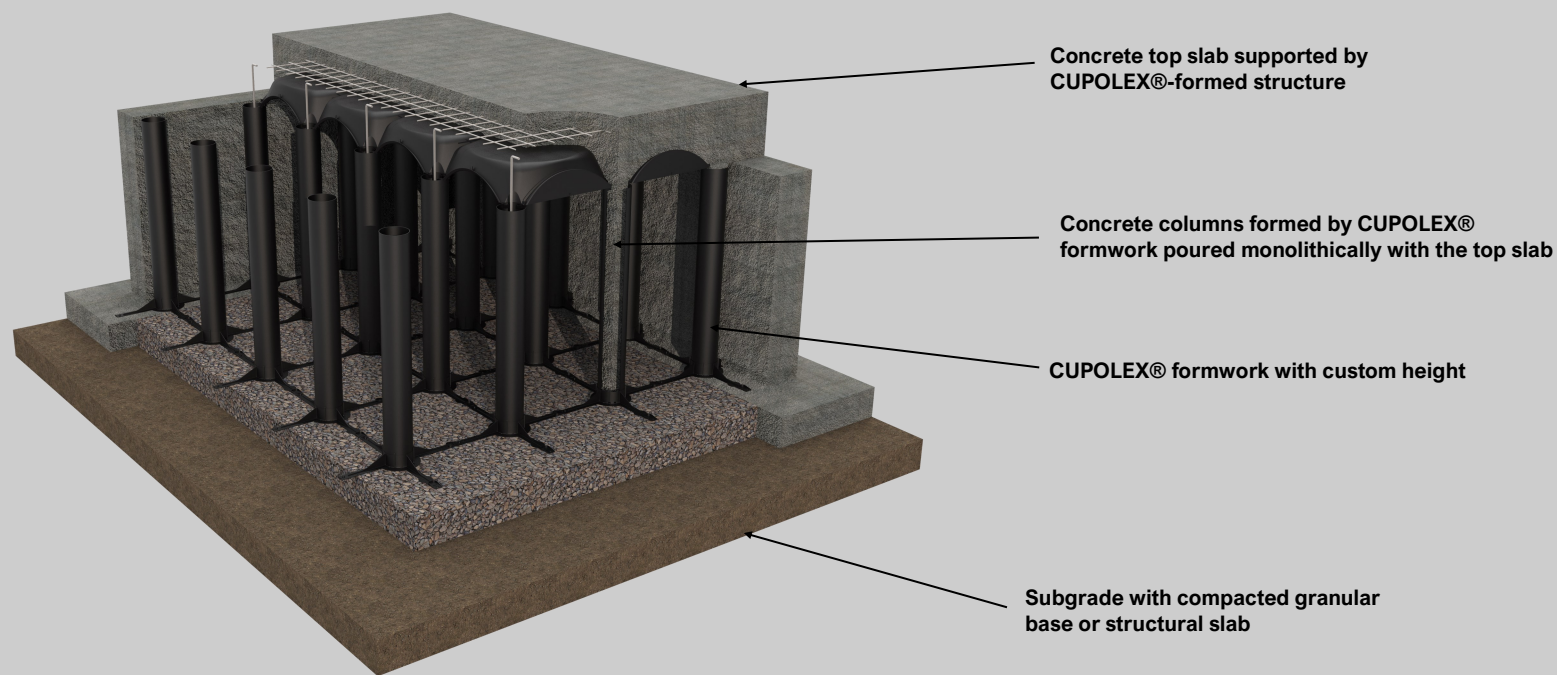
## RESULTING PRODUCT IS A CONCRETE FLOOR SLAB STRUCTURE

CUPOLEX® elevated floor slab structures are constructed by assembling the CUPOLEX® formwork. The CUPOLEX® formwork is supplied to contractors by Pontarolo Engineering and shipped directly to the project site or the contractor's yard from Pontarolo Engineering's manufacturing facilities. The CUPOLEX® forming system is installed by the contractor to form the elevated concrete cast-in-place structure as to the design and specifications provided by Pontarolo Engineering.

The resulting product is an engineered concrete structure capable of providing carrying capacities equivalent to conventional fill replacement. The elevated CUPOLEX® structure is supported by the matrix of concrete columns formed by the CUPOLEX® concrete forming system that are poured monolithically with the top slab. The loads are transferred vertically downward to the subgrade or structural slab below, allowing the structure to support high load-bearing capacities.



**Design can be integrated as the structural slab or act as a level surface for the placement of a predesigned structural slab.**



## Cost-Effective Alternatives to Structural or Lightweight Fill

We identify areas where contemporary challenges call for improved engineered solutions to fill solutions

The CUPOLEX® system is a proprietary patented plastic concrete pavement forming system manufactured by Pontarolo Engineering Inc. The concrete forms are part of a design package provided by CUPOLEX®. CUPOLEX® engineers design the concrete structures by sustainably engineering the geometry of concrete using CUPOLEX® structural dome methodology. On a site-specific basis, CUPOLEX® engineers select the type and size of CUPOLEX® forms necessary to meet the required elevations and that will provide the ultimate performance for your project. The forms are supplied to contractors by CUPOLEX® to assemble the structure as to the design and specifications provided by the CUPOLEX® design engineers.

CUPOLEX® forms are custom made to meet your site specific requirements such as varying depths, weather, special accommodations for underground utilities, special requirements for delivery and logistics, supporting working-load capabilities and any special impact resistance during installation and placement of the concrete.



### CUSTOMIZED DESIGN PACKAGE

- **Value engineering**  
CUPOLEX® engineers review each project, provide value engineering, and identify the type and size of CUPOLEX® for every project
- **Preliminary drawings**  
Design coordination, conceptual designs, sections and details provided to designers
- **Engineered design drawings**  
Issued for construction (IFC) and supported with FEA structural calculations, PE stamp, construction documents and specifications
- **CUPOLEX® installation shop drawings**  
Issued to contractor with detailed CUPOLEX® formwork installation procedures
- **On-site Support**  
Construction training and inspections, with completion statements and regulatory compliance reporting where required