Tower of Twelve
Coachella, CA, USA, 2016

PROJECT DESCRIPTION
The Tower of Twelve embodies a unique blend of architectural imagination with technical engineering mastery. The project is the aggregation of a series of modular blocks, each a rigid structure, assembled in a prescribed way to create an overall integrated structural system. The result is a visually complex assembly that appears void of any underlying "primary" support.

With no internal structure, each block serves as an integral structural component, critical to both gravity support and lateral stability of the piece as a whole. The Tower of Twelve was designed and engineered to be stable throughout the sequence of assembly.

PROJECT TEAM
Client | Coachella Valley Music & Arts Festival
Architect | Bureau Spectacular
Contractor | White’s Steel, Rice Construction, Felix Lighting
Structural Engineer | Nous Engineering

Fabrication
The typical challenges of engineering a complex structure were heightened in this case with the requirement that the piece had to be assembled on-site within one week with very little in the way of means-and-methods. Fortunately, a majority of the pieces could be prefabricated. The individual blocks are made of dimensional wood framing combined with CNC fabricated plywood laminates. The laminated beams allowed for shaping and stiffening. When fully assembled, the front edge of the open face block performs as an irregular stacked portal frame providing a measure of lateral resistance.

Nous worked closely with the designers to develop connection points and "hidden" connection details. It was important that the piece appear to be a simple geometric stack of blocks without any sign of interconnectivity. Structurally, however, the blocks had to link together to create a continuous, albeit highly intricate, load path to the ground.

Coachella Valley Music & Arts Festival routinely experiences high wind speeds making a tall structure more challenging. Especially so since it is not possible to build subgrade foundations. Instead, the piece is supported on a steel framed platform, referred to as the "sled", which was calibrated to ensure global stability under high winds and to evenly distribute bearing forces into the soft top-soil of the Polo Fields. The sled served a dual purpose enabling the piece to be transported to the festival location in two large assemblies.

Installation

Structural Analysis
Nous Engineering

Drawing: Bureau Spectacular