



# Residential

## Development

⊕ Rapid Concrete Column  
for Foundation Works

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Your local specialist in providing  
design and construction **ground  
improvement** and **geotechnical  
solutions**.



# Rapid Concrete Columns

## Solutions for Faster and Reliable Housing.

In the fast-paced residential market, foundation works often take a significant share of construction time.

Menard offers alternative foundation solutions using **Rapid Concrete Columns (RCC)**, a faster and more efficient alternative to traditional piling, designed specifically for residential developments.

**Rapid Concrete Columns (RCC)** eliminates common drawbacks of piles such as low productivity and spoil generation, while still delivering the same soil compaction and strength performance.

Using adjustable-strength columns, **Rapid Concrete Column (RCC)** efficiently supports building loads, allowing foundations to be installed up to 3x faster and at a lower cost than conventional piles.

**This lets developers build faster, cut costs, and deliver homes that meet both market demands and buyer expectations.**



Menard’s methodologies offer advantages in difficult sites, i.e. former landfill sites or sites with varying ground conditions. Due to our design and installation approach, changes in ground conditions or encountering obstructions can be easily overcome without redesign of the foundation solution.



**Rapid Concrete Columns (RCC)** are positioned below the footing, fully aligned with the original design, and integrated with pile caps and tie beams without altering the existing structure.

Column strength can be optimized since the injected mortar can be adjusted according to the load design, offering flexibility for various structural requirements. Rebar is installed only at the top of the column to connect with the footing, ensuring both safety and cost efficiency.

Items	Conventional Pile	Rapid Concrete Columns (RCC)
Production	<ul style="list-style-type: none"> <li>The installation of Bored pile usually ranging from 60-100 m/shift/rig</li> <li>The installation of Driven Pile usually ranging from 100-120 m/shift/rig</li> </ul>	<ul style="list-style-type: none"> <li>Fast installation with fewer steps and less equipment</li> </ul>
Load Intensity	<ul style="list-style-type: none"> <li>High-strength concrete, typically <math>f_c &gt; 35</math> Mpa</li> <li>Designed to receive 100% load design</li> </ul>	<ul style="list-style-type: none"> <li>Low to medium-strength mortar, ranging between 15-25 Mpa</li> <li>Designed to receive 100% load design</li> </ul>
Installation	<ul style="list-style-type: none"> <li>While it can reach a depth of &gt;30m, bored pile requires supporting equipment for installation e.g. casing</li> <li>Driven Pile has standard fabricated length of 12m and requiring joints for extension to greater depth</li> </ul>	<ul style="list-style-type: none"> <li>RCC can be installed up to &gt;30m without joint connections or additional supporting equipment</li> </ul>
Impact on Adjacent Structure	<ul style="list-style-type: none"> <li>Bored pile requires spoil disposal area and may affect nearby facilities</li> <li>Driven pile with hammer generates vibration to surrounding existing structure during installation</li> </ul>	<ul style="list-style-type: none"> <li>RCC is installed using displacement auger, producing no vibration and minimal disturbance to nearby structures</li> </ul>
Spoil & Pollution	<ul style="list-style-type: none"> <li>Installation of bored pile, using continuous auger method, generates a large amount of soil spoils</li> </ul>	<ul style="list-style-type: none"> <li>Displacement method produces minimal to no spoil, keeping site conditions clean and low-impact</li> <li>Reduced carbon footprint due to less concrete and zero spoil handling</li> </ul>

# From Villa to Vertical Living

One foundation solution for every Home



## Elite Town - Villa C in Phnom Penh

Ground improvement was carried out to strengthen the soil beneath the villa's shallow footings. It provides a shallow foundation for the villa, fence, and parking areas. Columns with 32cm diameter columns were installed to match the site's cohesive soft soil conditions, providing sufficient capacity to sustain a service load of 25 tons, a reliable foundation system without the need for deep piling.

## Four-Storey Building in Phnom Penh

Ground improvement replaced the initial foundation plan using bored piles. Ground Improvement technique enabled the use of isolated footings on a shallow foundation, achieving the same load-bearing performance as piles while reducing installation time and cutting foundation costs by over 50%.

## Nine-Storey Residential Development in London

A 9-storey residential development with 111 apartments, cafés, and restaurants on made ground, alluvium, and clay. 32 cm RCCs combined with a Load Distribution Mattress were installed to reduce settlement and allow the structure to be supported on a raft foundation. This solution provides a faster and more economical alternative to deep piles.

## BUT MENARD GEOSYSTEMS

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