

## SUSTAINABLE SOLUTIONS: CONTINUOUS FLIGHT AUGER (CFA) PILING

CFA Piles can provide an economical piling solution depending on the site and ground conditions. They are ideally suited to urban areas as they produce little noise or vibration during installation. The pile is adaptable to different ground conditions and can be used for creating walls as well as bearing piles.

SUSTAINABILITY CATEGORY	SOLUTION OFFERING
Environment	<ul style="list-style-type: none"> <li>✓ Auger displacement system produces no spoil</li> <li>✓ Possible to reduce the diameter and length of the pile using EC7 and innovative design</li> <li>✓ Using more cement replacement in pile concrete will improve pile sustainability</li> </ul>
Community	<ul style="list-style-type: none"> <li>✓ Low noise and vibration to minimise disturbance in environmentally sensitive areas</li> </ul>
Economic	<ul style="list-style-type: none"> <li>✓ Geothermal loops within CFA piles can extract heat energy from the ground to help heat or cool buildings</li> <li>✓ Auger Displacement System produces no spoil and so saves money on disposal costs</li> </ul>

BBGE PRODUCT SUSTAINABILITY RATING	HOW TO IMPROVE RATING
	<ul style="list-style-type: none"> <li>✓ Using the Auger Displacement System generates no spoil</li> <li>✓ Reduce diameter and length using EC7 and innovative design</li> <li>✓ Using cement replacement in the concrete</li> <li>✓ Consider using Driven Precast Piles or Ground Improvement</li> <li>✓ Using certified 'responsibly sourced' steel reinforcement and concrete in piles</li> </ul>
<p>Note: The above products have been scored on a rating system, developed by BBGE, that consider the following items: Concrete; Steel; Transport; Equipment and Spoil. A BBGE Technical Paper 'Sustainability in Foundations' is available on request.</p>	

Did you know...

**// GEOTHERMAL PILES**

Working on a site in East London, BBGE recently installed CFA Geothermal Piles. The piles were fitted with a twin, 20m long, sealed heating loop to draw energy from the surrounding ground to heat and cool the building above. Construction of CFA Geothermal Piles is quick and effective.



**// CARBON CALCULATOR**

The BBGE Carbon Calculator is the first of its kind in the industry to calculate the carbon emissions from prospective piling projects as part of the estimating process, enabling the customer to select the most energy-efficient piling solution.

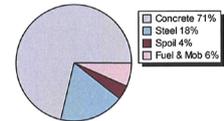
**Balfour Beatty** **CFA**  
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Estimate:  
Project:  
Tender: 219 no Piles & 8 Crane Base Piles  
Prepared: 29/04/2008

**Summary**

Approximate tonnes of carbon dioxide embedded and emitted:

Concrete	135.07 te	(includes transport)
Steel	34.67 te	(includes transport)
Spoil	7.79 te	(transport only)
Fuel & Mob.	13.12 te	
<b>Total CO<sub>2</sub></b>	<b>190.65 te</b>	



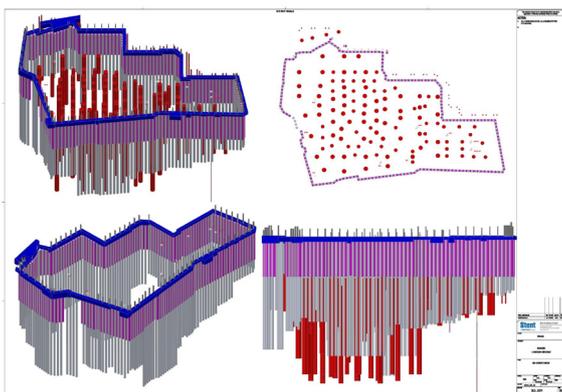
**Breakdown**

**Concrete**

Concrete Mix	Strength/Class	Replacement	CO <sub>2</sub> Kg/m <sup>3</sup>	Volume	Transport CO <sub>2</sub>	Total CO <sub>2</sub>
Male	C28/35 DC-2	70% GGBFS	128.47 kg	1,041.19 m <sup>3</sup>	1,304.71 kg	135.07 te
Female	C8/10 DC-1	90% GGBFS	54.02 kg	0 m <sup>3</sup>	0 kg	0 te

**// DESIGN TECHNOLOGIES**

Our design experience and innovative solutions allow us to reduce the length of our CFA piles in London Clay by an average of 10%. Over-design often leads to waste and at BBGE we actively promote early contractor involvement to eliminate this waste.



**FOR FURTHER INFORMATION CONTACT:**

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