

## CASE STUDY

### FOUNDATIONS FOR A NEW HOUSING ESTATE

**Project:** Design and installation of precast piles and Smartfoot® precast modular foundations.

**Location:** Bestwood Village, Nottinghamshire

**Client:** David Wilson Homes

As Modern Methods of Construction continue to top the agenda with large housebuilders and commercial builders alike, Van Elle's pre-cast systems are seeing a real take up across the industry as these developers look to realise the benefits. Designed using an innovative and bespoke software package from multiple locations across the UK and manufactured at Van Elle's new manufacturing facility in Norfolk, the Vemech® and Smartfoot® systems are the latest in offsite foundation engineering.

The work for David Wilson at the site in Bestwood consists of piling and foundations for 16 No. four and five bedroom detached executive homes with garages.

333 No. 200mm square precast Vemech® piles were designed and installed in 2.5m lengths to depths of up to 5m over a nine day programme. Utilising the 24 tonne precast concrete driven piling rig, a 360° tracked machine built in-house, Vemech® is the only short segmental concrete pile designed in compliance with European design codes.



Benefits of using Vemech® included:

- Reduced piling mat due to being able to utilise a smaller rig.
- Increased flexibility on variations in pile lengths due to short segments.
- No spoil to be removed from site so reducing vehicle movements, carbon emissions and safety hazards.



As Smartfoot® precast modular foundations are completely bespoke, they aren't limited to typical angles.

Once the piling had been carried out and pile caps cast, the Smartfoot® team moved in to install the ground beams. Whilst the system is based on a simple post-tensioned principle, the profusion, in modern architecture, of more complex structural designs has highlighted the requirement for precast angle joints. These were in abundance on the Bestwood site. 15 No. 45° angle blocks were used and a total of 9651m of 330mm wide ground beams were installed.

Smartfoot® is widely recognised as the most time efficient product of its type on the market today right through from initial design to the follow-on trades beginning work on site. On this scheme, compared to traditional cast in-situ foundations our system took less than half the time to install on site and required a much reduced dig with less spoil to remove and no wastage.

The beams were delivered to site numbered and ready for installation and although we were experiencing unusually wet conditions, being a completely dry system the programme wasn't affected. Using Smartfoot® also meant that there was no need for concrete deliveries to site, no requirement for 3<sup>rd</sup> party specialist skills, as the beams are installed by the Van Elle team, and the working conditions, particularly when wet, are hugely improved – meaning fewer health and safety hazards.



Cured beams numbered and stacked in the Van Elle factory waiting to be loaded onto a wagon in reverse order to be delivered to site.

The original 60 day scheduled programme was reduced to 34 days due to the perceived benefits of using our precast pile and beam package, however, we actually completed the Smartfoot installation in only 30 days.

Smartfoot® was the obvious choice for this site not only because of its speed, but also because of its ability to be installed in any given shape using the bespoke angle joints. It also offered the client very high levels of accuracy (+/-3mm) and it is fully Lantac and NHBC approved.

Overall we achieved a programme of 39 days and, with an extremely happy client, this site was a glowing example of why offsite construction methods make real commercial sense.