



ABBEY PYNFORD

CASE STUDY

# Western Avenue

DURKAN

**HOUSEDECK**

**Name:** Western Avenue

**Location:** Ealing, London

**Value:** £3m

**Site size:** 14 units / 5,874m<sup>2</sup>

**Duration:** 25 weeks

**Client:** Durkan



This new housing development in Ealing consists of 180 flats and houses spread over five sites.

All the locations were Brownfield sites and had issues with ground contamination and ground gas. In addition, the underlying London clay was classified as high plasticity, and due to the location of existing trees, there was a risk of ground heave.

## Flats

The design for the flats was Reinforced Concrete (RC) frame structure up to 7 stories. The superstructure was designed on 450mm dia. piles, pile caps up to 1.5m thick and cast in situ RC slab, with associated heave precautions. It was anticipated the piling mat would be up to 600mm thick.

Our design team proposed our Housedeck system, using 375mm thick slabs and 350mm dia. piles. A clear void was incorporated to allow for heave and under-slab ventilation, due to the ground gas risk.

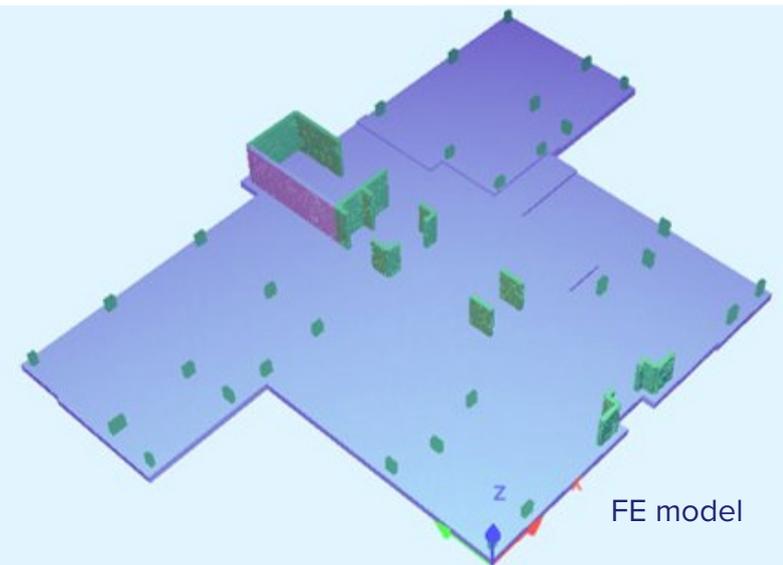


Not only were we able to reduce the concrete requirements but by carrying out additional Site Investigation (SI) works, we were able to value engineer the piling mat and reduce the thickness to 300mm. Offering significant savings in contaminated spoil removal and importation of crushed material.

### Terrace Houses

The terrace houses were originally designed on deep trench fill foundations with associated sub-structure masonry and beam and block floor. We proposed our Housedeck system, using 225mm thick slabs and 250mm dia. piles and our Brick Support Units (BSU). A clear void was also incorporated to mitigate the heave risk and allow for gas ventilation.

Due to the depth and diameter of our piles, we were able to use our midi rigs, allowing us to



utilise our 50mm Concrete Working Surface (CWS), in place of a traditional piling mat.

### Design

In order to propose our value engineered design schemes, we carried out targeted Site Investigations, using Cone Penetration Testing (CPT). This allowed us to reduce the pile diameters and construct the flats on 350mm dia. piles instead of the originally proposed 450mm dia. piles.

We also created 3D FE models incorporating the stiffness of the super-structure into our foundation design. This allowed us to propose a 375mm thick slab throughout, instead of pile caps.

### Material savings

The schemes we provided offered significant savings due to the reduction in materials. By using Housedeck vs a compliant bid we saved:



## Typical Houdeck voided piled raft

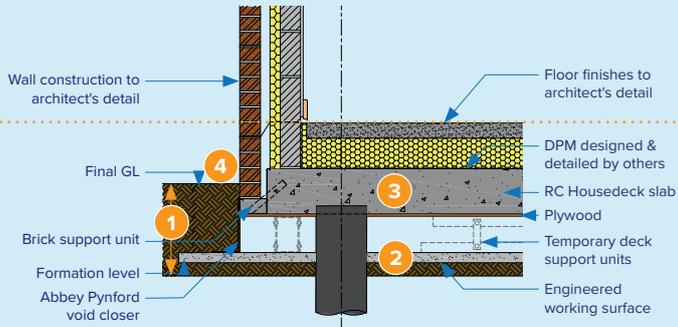
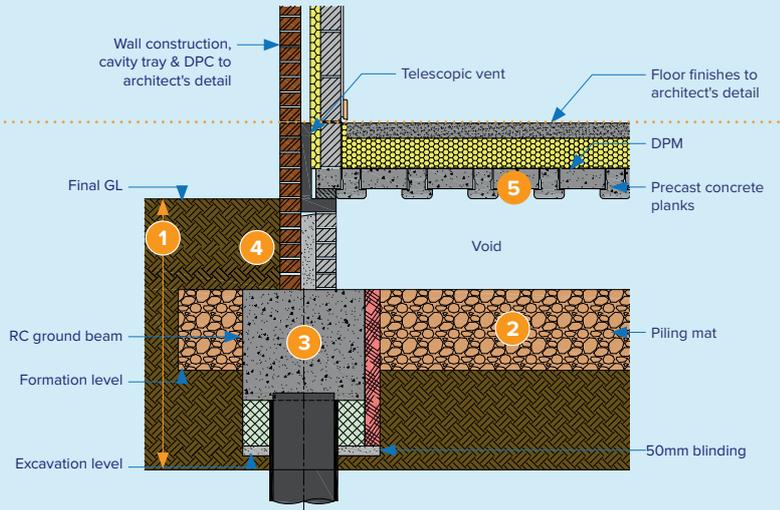


Illustration showing minimised material requirements and reduced excavation.

## Traditional pile and beam



- 1 ▶ **5,900m<sup>3</sup> of contaminated spoil from landfill** by reducing level of excavation
- 2 ▶ **3,155m<sup>3</sup> imported granular fill**, due to the reduced excavation, 50% thinner piling mats, and using our Concrete Working Surface (CWS).
- 3 ▶ **500m<sup>3</sup> concrete and 200 tonnes of reinforcement**, by slimming down the piles, negating the need for pile caps and trench fill foundations, less RC concrete was needed.
- ▶ **5,492m<sup>2</sup> Cellcore**, as we used a voided slab to mitigate the heave risk, Cellcore was reduced.
- 4 ▶ **1000m<sup>2</sup> sub-structure masonry work**, due to our piled raft design mitigating the need for ground beams and beam and block floors, less masonry sub-structure was required.
- 5 ▶ **1,950m<sup>2</sup> of beam and block flooring**, as Houdeck is a foundation and ground floor system, beam and block flooring was no longer required.



Get in touch to discuss your project requirements:

**e: [info@abbeypyford.co.uk](mailto:info@abbeypyford.co.uk)**

**t: 01442 212112**

**[abbeypyford.co.uk](http://abbeypyford.co.uk)**

