

MS3 & MS4 GANTRY FOUNDATIONS

M1 MOTORWAY (2007-2008)



An idea for a sustainable and cost effective foundation to a motorway signal gantry was formulated during discussions within the "Steel Piling Group" in the late 1990's. The idea was to construct a foundation from a ring of six individual sheet piles, joined with omega bars. The top 1.5m of the sheet pile box is left above ground and allows a bolted connection to a "can" which in turn offers a bolting face for the gantry mast.

Main contractor Nuttall Hynes, consultants Mouchel

Parkman and Atkins Odlin along with Dawson Contract Piling Ltd took the concept to the highways and obtained AIP.

In 2007/08 Dawson Contract Piling installed 25 MS3 foundations on the M1 motorway. The sheet pile box foundation was installed in one possession and the "can" in a second possession. This can be compared to at least 3-4 weeks work with a conventional base.

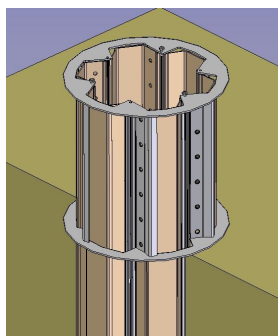


Technical Specifications

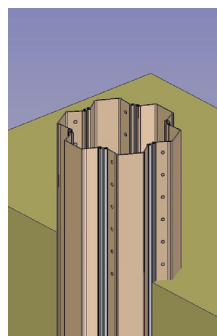
After completion of ground preparation and leveling. Pre-augering began Ø600x 6-8m deep through a template. A sheet pile guide fixture was secured with 305x305 H-piles.

The 8-12m long PU22 piles were positioned in a ring of 6, connected with an omega bar in the ground fixture and driven with a 16m leader rig and a 20kgm eccentric moment vibrator. If required, the piles were back driven with an impact hammer - Dawson HPH2400.

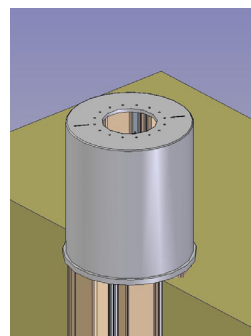
The hole template was then swung into position and holes drilled into the piles. The template was removed and the can fitted and bolted into place, ready for the gantry.



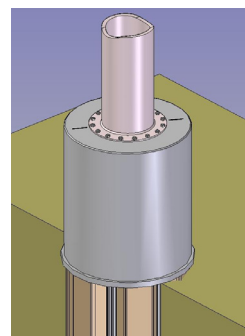
Hole template in position



Piles with bolt holes drilled



Can fully bolted in position



Can finished and ready gantry



ADVANTAGES OF THE DAWSON FOUNDATION SYSTEM

- With the possibility of the M1 being widened, the foundation can be easily removed and partially re-used if necessary.
- This foundation is exceptionally quick and easy to construct, leading to minimal traffic management. The sheet piles can be extracted relatively easily if the motorway had to be widened or the signage becomes obsolete.
- The foundation is versatile, where different pile types, lengths and installation techniques can be used to suit the geology and load conditions.