

## 5. Development of the Okumura-Marugo pull-out Resistance Pile Method (OMR/B-2) - Results of Full-scale Pull-out Loading Tests -

Yoshihisa Hayashi, Akifumi Takeda, Shunji Kodani, Hidetaka Funaki

The bucket type bell pile method (OMR/B) has a high pull-out resistance in the bell enlargement. However, evaluations of pull-out resistance have been limited to the surface resistance of the pile shaft and the weight of the pile itself, which generally leads to increased pile shaft diameters or pile lengths to ensure the pull-out resistance required for a specific design.

In response, we performed pull-out loading test of full-size piles anchored by the bucket type bell pile method (OMR/B) to confirm the following:

- i. Regardless of the soil type, the maximum pull-out load, the second limit resistance force and the degree of circumferential resistance in the bell enlargement region increase with increasing tilt angle.
- ii. Bearing capacity factor of the ground calculated from the experimental results exceeds the solutions of the evaluation formulae proposed in existing studies.

Assessments of the increased pull-out resistance generated by the sloping surface of the bell enlargement led to its approval as the new bucket type bell pile method (OMR/B-2) by the Center for Better Living, a general incorporated foundation in Japan.

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