TECHNICAL REFERENCE

Famfa Oil Building

Lagos, Nigeria

Large Diameter Piles

Cased Secant Piles

Cross Hole Tests

Owner:	DAYSPRING PROPERTIES Nig. Ltd.
Main Contractor:	TREVI FOUNDATIONS NIGERIA *(Foundation Works)*
Duration of works:	**2016 - 2017**

Introduction

Trevi Foundations Nigeria Ltd was appointed to work on the foundations of **one of the tallest buildings in Lagos, a project owned by Famfa Oil Ltd, one of the most prominent local oil Companies in Nigeria.**

The project was initiated as a result of a first agreement with the Real Estate Company of the group, Dayspring Property Development Company Ltd. Trevi was awarded the engineering and piling works to be executed within ten months which comprises of a preliminary load test to destruction *(Ø 800 mm and length 58 m)* with 4 reaction piles up to a load of 12,650 kN; 13,600 m of **bored piles of various diameters *(800 mm - 1,200 mm - 1,500 mm)* with length between 58 m and 64 m,** a perimeter retaining wall made of CSP technology of 3,900 m² consisting in part by 600 mm and in part by Ø 800 mm piles, 14.5 m and 17.5 m long respectively. Also included in the scope of work are the performance of 2 Nos.

Static Load Tests each with 2 Nos. reaction piles up to a load of 8,257 kN and 6 tests to verify the integrity of the piles by means of Sonic Integrity Test *(Cross-hole).*

Trevi worked with staff strength of 80 people and two drilling rigs Soilmec *(SR-75, SR-60)* for the bored pile installation, and drilling rig Soilmec SF-120 for the CSP technology.

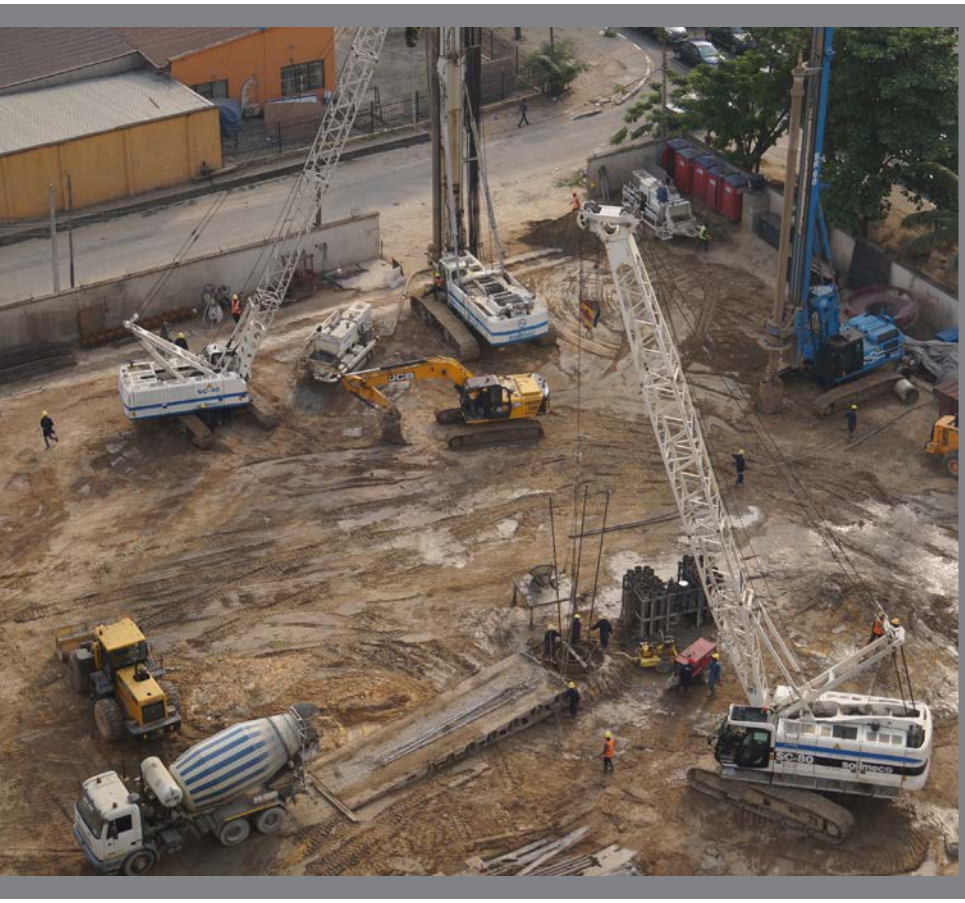
This contract was administered strictly in accordance to the terms and conditions of the Contract Agreement and the project was delivered to high quality standard expected by the client.

Before the commencement of the project, Trevi performed detailed engineering designs for bored piles and cased secant piles technology that were adopted.

Trevi works

Engineering

- Detailed piled foundation design including preparation and issue of pile layout drawing
- Detailed CSP wall design including preparation and issue of pile layout and construction drawing



Site Preparation / Filling

- Site clearance and removal of temporary structures and buried facilities and cart away from site *(5,712 m²)*
- Fillings to make up general site levels

Preliminary Pile Installation & Testing

Installation of:

- **1 No.** Ø 800 mm bored pile to 58 m depth with a SWL of 5,060 kN
- **4 Nos.** Ø1200 mm permanent / traction bored piles to 58 m depth with a SWL of 9,930 kN
- PLT on any Ø 800 mm. Preliminary bored pile to 2.5 x SWL of 5,060 kN or 12,650 kN using Traction piles

Working Pile Installation & Testing

- **54 Nos.** Ø 800 mm bored pile to 58 m depth with a SWL of 5,505 kN
- **106 Nos.** Ø 1200 mm bored pile to 58 m depth with a SWL of 9,390 kN
- **8 Nos**. Ø1200 mm permanent / traction bored pile to 58 m depth with a SWL of 9,390 kN
- **56 Nos**. Ø 1200 mm bored pile to 64 m depth with a SWL of 11,840 kN
- **5 Nos.** Ø1500mm bored pile to 58 m depth with a SWL of 12,800 kN
- **2 Nos.** PLT on any Ø 800 mm bored pile to 1.5 x SWL of 5,505 kN using Traction piles

Sonic Integrity Test (Cross-Hole)

Performance of Cross-Hole test

- **2 Nos.** of Ø 800 mm bored piles to 58 m depth
- **2 Nos.** of Ø 1200 mm bored piles to 58 m depth
- **2 Nos.** of Ø 1500 mm bored piles to 58 m depth

Cased Secant Pile (CSP) Wall Installation

Excavate to depth and construct 2 rows of reinforced concrete guide wall for CSP wall *(550 m)*

Drill and install:

- **134 Nos.** unreinforced primary CSP Ø 620 mm to depth of 13.5 m below existing ground level.
- **133 Nos.** reinforced secondary CSP Ø 620 mm to depth of 14.5 m below existing ground level.
- **102 Nos.** unreinforced primary CSP Ø 815 mm to depth of 15 m below existing ground level.
- **103 Nos.** reinforced secondary CSP Ø 815 mm to depth of 17.5 m below existing ground level.

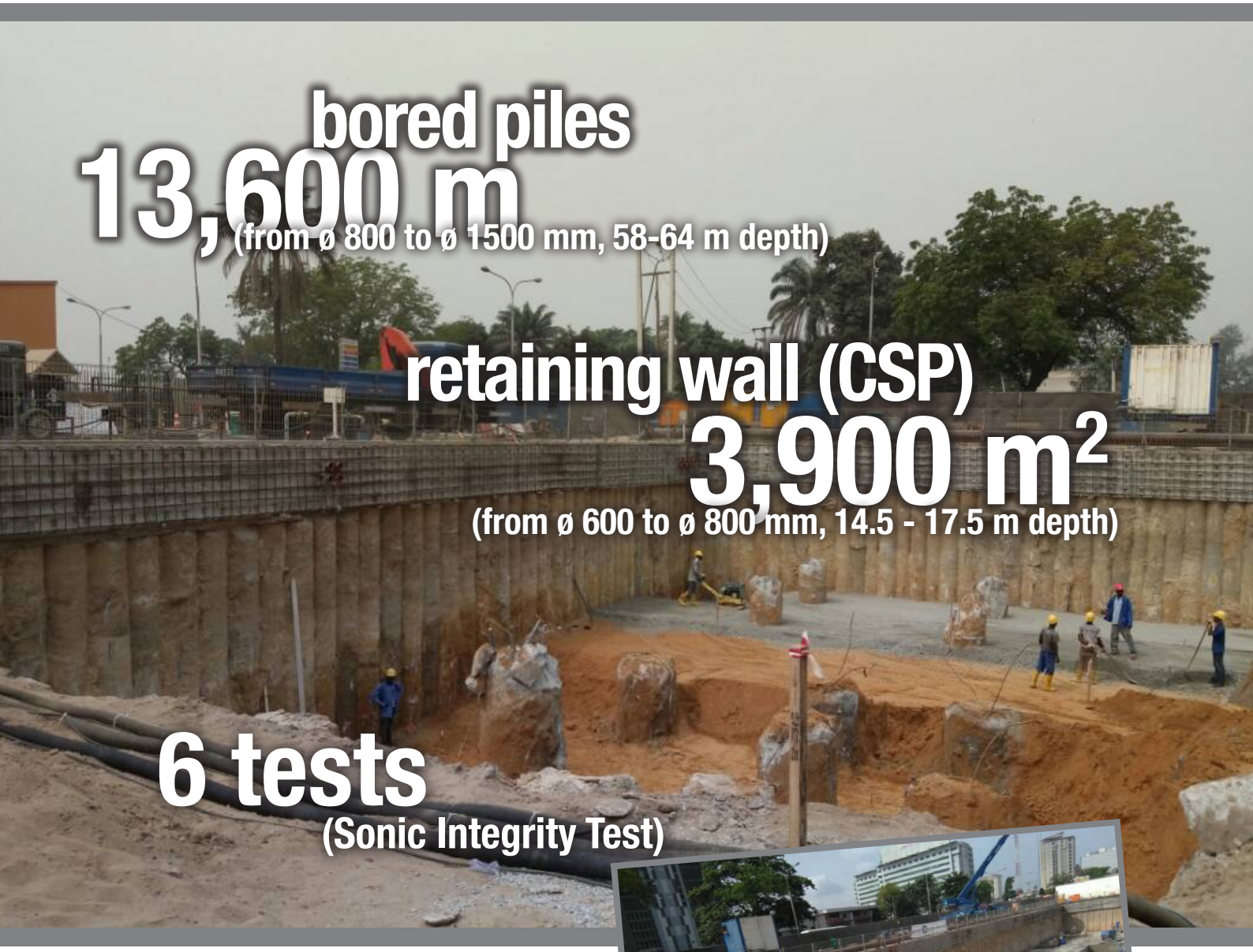
Mobilization of bored piles and Cased Secant Piles resources to site commenced on 1st of Sept., 2016. Installation of bored piles started on 28th of Oct., 2016 and was completed on the 12th of May, 2017. Cased Secant Piles installation commenced on the 15th of Nov, 2016 and was completed on 30th of March, 2017. Site preparation and set-up, pre-dilapidation surveys of adjoining buildings were carried out before the commencement of piling activities.

Conclusion

Working in foundations presents some very challenging situations. Assessing them on ground is very essential to limit any risk which may occur. **Trevi engaged high professionalism throughout the duration of the project and as the project demands to ensure seamless operation.**

The work was administered in a safe and professional manner as adequate safety measures were put in place.

No accident was recorded throughout the project duration. The project was timely delivered within the stipulated period of 10 months.



TREVI FOUNDATIONS NIGERIA

TREVI
a TREVIGroup company

Plot 4, Block B, Gbagada Industrial scheme,
Gbagada Expressway, Gbagada, **Lagos**, Nigeria.
Tel. +234 81.50892.906 / +234 81.88164.473
e-mail: **tfnl@trevinigeria.com**
www.trevinigeria.com