

Diaphragm Wall Tiebacks

50 Calle
Panama City, Panama



MALCOLM

Retention Systems

CONSTRUCTION PERIOD

January to June 2013

CLIENT

Owner: F&F Properties
General Contractor: F&F Properties

SERVICES

660 L.ft. of Permanent Diaphragm Wall

2 Rows of Temporary Tieback Anchors

BENEFITS OF PERMANENT DIAPHRAGM WALL

- Temporary shoring not required (time and cost savings)
- Dewatering minimized due to wall embedment into underlying rock

CONTACT MALCOLM

This job was managed by our Southern California Division in Irwindale, CA.

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Project Overview

A new commercial development at 50 Calle included construction of a four-level underground parking garage. Malcolm designed and constructed the diaphragm wall, optimizing the design to enable the wall to perform the dual function of being a temporary retaining wall for the excavation and a permanent wall for the basement. This resulted in substantially reducing the schedule and large savings in the overall project costs.



Construction Details

The permanent basement walls of the residential building were constructed by means of diaphragm wall construction using reinforced concrete panels. Two levels of tiebacks were installed as excavation of the basement progressed, which provided temporary support of the basement walls. The diaphragm wall was socketed into rock to cut off potential groundwater flow, and temporary tiebacks were installed to support the basement excavation. Malcolm utilized state-of-the-art equipment to excavate the slurry diaphragm wall panels and diaphragm wall end stops equipped with embedded water stops at the construction joints. Approximately 28,000 square feet of slurry diaphragm walls were installed, all keyed into the underlying bedrock.

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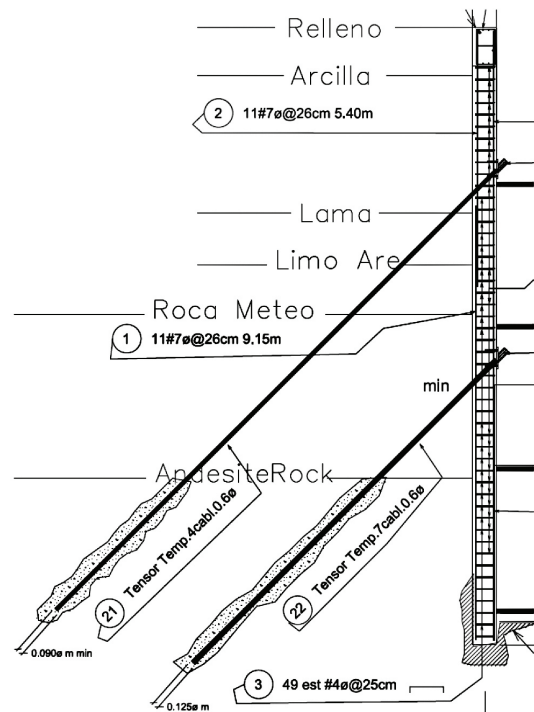
Retention Systems

Ground Conditions

Subsurface conditions at the site consisted of fill, clay with gravel, plastic clays, sandy silt, silty clays with embedded boulders, and rock with various degrees of weathering. Very hard quartz veins were encountered within some rock layers. Groundwater fluctuated from 6 to 20 feet below the ground surface.

Quality Control

Slurry properties were checked twice per shift, and the fresh slurry was always exchanged 100% prior to each re-bar cage installation. A concrete mix design was developed with special emphasis on workability and retention for the extended delivery time (inner city location) and duration of the placement operation. The tremie concrete installation was monitored by QC engineers, and the tremie pipes were always kept at a minimum of 10 feet below the top of concrete during the concrete pouring process.



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